

testebi samedicino qimiaSi (I)

1. CamoTvl il ebidan romel ia gamosxivebis erT aqtSi gamoTavisufI ebul i energiis umciresi raodenoba?  
1) spini; 2) qvanti; \* 3) impul si; 4) kvarki.
2. moyvanil i formul ebidan romel i Seesabameba de-broil is gantol ebas?  
1)  $E=mc^2$ ; 2)  $mv =h/$  ; \* 3)  $E=h$  ; 4)  $mc =h/$  .
3. CamoTvl il i maxasiaTebi ebidan romel i icvl eba tal Ris gavrcel ebis kanonzomierebiT?  
1) el eqtronis masa; 2) el eqtronis energia;  
3) atombirTvis garSemo el eqtronis yofnis al baToba; \*  
4) el eqtronis impul si.
4. CamoTvl il i kanonzomierebidan roml is mixedviT aris SeuZl ebel i mikronawil akebis impul sisa da mdebareobis erTdroul ad gansazRvra?  
1) de-broil is principi; 2) umciresi energiis principi;  
3) hundis wesi; 4) heizenbergis principi. \*
5. CamoTvl il i mosazrebebidan romel ia araswori?  
1) erT energetikul doneze erTi formis orbital ebia; \*  
2) erT energetikul doneze Sesazl ebel ia sxvadasxva energiis orbital ebis arseboba;  
3) energetikul qvedoneze orbital ebis el eqtronebiT Sevseba eqvemdebareba hundis wess;  
4) periodul i sistemis el ementebSi qvedonebis maqsimal uri ricxvi aris oTxi.
6. romel i formul a gamoxatavs el eqtronis orbunebovnebas?  
( $\lambda$  - tal Ris sigrZe,  $v$  - sixSire,  $m$ - masa,  $v$ - siCqare,  $h$ - pl ankis mudmiva,  $E$ - energia,  $c$ - sinaTl is siCqarea vakuumSi).  
1)  $E=mc^2$ ; 2)  $mv =h/$  ;\* 3)  $E=h$  ; 4)  $mc =h/$  .
7. romel i periodis el ementebS aqvT gare energetikul i Sris el eqtronebisatvis mniSvnel oba  $n+l= 5$ ?  
1) 5; 2) 4, 5; \* 3) 3,4,5; 4) 3,4.
8. CamoTvl il i mosazrebebidan romel ia swori?  
1) l iTonuri Tvisebebi mcirdeba ionizaciis energiis zrdasTan erTad; \*  
2) atomuri nomris zrdasTan erTad el eqtrouaryofiToba monotonurad izrdeba;  
3) nawil obriv Sevsebul i qvedone ufro mdgradia, vidre naxebrad Sevsebul i;  
4) el eqtrouaryofiToba axasiaTebS atoms izol irebul mdgomareobaSi.
9. CamoTvl il i kvanturi ricxvebis romel i oTxaul i SeiZl eba hqondes el eqtrons atomSi?  
1)  $n=4, l=4, m=2, s=-1/2$ ; 2)  $n=2, l=1, m=0, s=-1/2$ ;  
3)  $n=0, l=0, m=0, s=-1/2$ ; 4)  $n=2, l=1, m=2, s=+1/2$ .
10. CamoTvl il i kvanturi ricxvebis romel i oTxaul i SeiZl eba hqondes el eqtrons atomSi?  
1)  $n=4, l=3, m=2, s=-1/2$ ; \* 2)  $n=2, l=2, m=0, s=-1/2$ ;

- 3)  $n=1, l=0, m=1, s=-1/2$ ;                      4)  $n=2, l=2, m=2, s=+1/2$ .
11. qvemoTmotanil Tagan kvanturi ricxvebis romel i oTxeul i ar SeiZl eba hqondes el eqtrons atomSi?
- 1)  $n=4, l=3, m=2, s=-1/2$ ;                      2)  $n=2, l=1, m=0, s=-1/2$ ;  
 3)  $n=1, l=1, m=2, s=-1/2$ ; \*                      4)  $n=2, l=1, m=1, s=+1/2$ .
12. qvemoTmotanil Tagan kvanturi ricxvebis romel i oTxeul i ar SeiZl eba hqondes el eqtrons atomSi?
- 1)  $n=4, l=4, m=2, s=-1/2$ ; \*                      2)  $n=5, l=3, m=0, s=-1/2$ ;  
 3)  $n=4, l=2, m=-2, s=-1/2$ ;                      4)  $n=2, l=1, m=1, s=+1/2$ .
13. CamoTvl il i mosazrebebidan romel ia araswori?
- 1) mikronawil akebis tal Ris sigrZis gazomva SesaZl ebel ia;  
 2) SeuZl ebel ia erTdroul ad mikronawil akebis rogorc impul sis, ise mdebareobis gansazRvra;  
 3) tal Rur funqcias aqvs mxol od dadebiTi mniSvnel oba; \*  
 4) tal Ruri gantol eba yovel mocemul momentSi el eqtronis zusti adgil mdebareobisa da misi sicqaris gansazRvris saSual ebas ar iZl eva.
14. CamoTvl il i qvanturi ricxvebidan romel i gansazRvravs energetikul dones:
- 1) mTavari qvanturi ricxvi; \*                      2) orbital uri qvanturi ricxvi;  
 3) magnituri qvanturi ricxvi;                      4) spinuri qvanturi ricxvi.
15. CamoTvl il i qvanturi ricxvebidan romel i gansazRvravs el eqtronul i orbital is sivrciT orientacias?
- 1) mTavari ricxvi;                      2) orbital uri qvanturi ricxvi;  
 3) magnituri qvanturi ricxvi; \*                      4) spinuri qvanturi ricxvi.
16. CamoTvl il i kanonzomierebebidan romel i gansazRvravs energetikul i doneebis Sevsebis Tanmimdevrobas?
- 1) paul is principi;                      2) kl eCkovskis wesi; \*  
 3) hundis wesi;                      4) heizenbergis principi.
17. CamoTvl il i kanonzomierebebidan roml is mixedviT aris erT orbital ze mxol od antiparal el uri spinebis mqone ori el eqtronis arseboba SesaZl ebel i?
- 1) paul is principi; \*                      2) umciresi energiis principi;  
 3) hundis wesi;                      4) heizenbergis principi.
18. energetikul doneebze el eqtronebis ganawil eba ar eqvemdebareba:
- 1) paul is princips;                      2) kl eCkovskis wess;  
 3) hundis wess;                      4) heizenbergis princips. \*
19. risi tol ia el eqtronebis maqsimal uri ricxvi energetikul doneze?
- 1)  $n^2$ ;                      2)  $2n^2$ ; \*                      3)  $2l+1$ ;                      4)  $2(2l+1)$ .
20. risi tol ia el eqtronebis maqsimal uri ricxvi qvedoneze?
- 1)  $n^2$ ;                      2)  $2l$ ;                      3)  $2l+1$ ;                      4)  $2(2l+1)$ . \*
21. f-bl okis el ementebisaTvis val enturia :
- 1)  $(n-1)$  energetikul i donis f-el eqtronebi;  
 2)  $(n-2)$  energetikul i donis f-el eqtronebi; \*  
 3)  $n$  energetikul i donis f-el eqtronebi;  
 4)  $(n-2)$  energetikul i donis d-el eqtronebi.

22. p-bl okis el ementebisaTvis val enturia :

- 1) mxol od n energetikul i donis p-el eqtronebi;
- 2) mxol od n energetikul i donis s-el eqtronebi;
- 3) n-1 energetikul i donis p-el eqtronebi;
- 4) n energetikul i donis s- da p-el eqtronebi.\*

23. rogoria meoTxe, mexuTe da meeqvse energetikul i donis el eqtronul i aRnagoba oqros atomSi?

- 1)  $4s^2 4p^6 4d^{10} 4f^{14} 5s^2 5p^6 5d^9 6s^2$ ;
- 2)  $4s^2 4p^6 4d^{10} 5s^2 5p^6 5d^{10} 6s^2 6p^3 6d^{10}$ ;
- 3)  $4s^2 4p^6 4d^{10} 5s^2 5p^6 5d^{10} 6s^1 6p^6 6d^8$ ;
- 4)  $4s^2 4p^6 4d^{10} 4f^{14} 5s^2 5p^6 5d^{10} 6s^1$ . \*

24. romel ia iodid-ionis ( $I^-$ ) el eqtronul i konfiguracia?

([Kr]=  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6$ )

- 1) [Kr] $4d^{10} 4f^{14} 5s^2 5p^5$ ;
- 2) [Kr] $3d^{14} 4d^{10} 5s^2 5p^6$ ;
- 3) [Kr] $4d^{10} 5s^2 5p^6$ ;
- 4) [Kr] $5s^2 5p^5$ .

25. romel ia iodis atomis (I) el eqtronul i konfiguracia?

([Kr]=  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6$ )

- 1) [Kr] $4d^{10} 5s^2 5p^5$ ;
- 2) [Kr] $3d^{14} 4d^{10} 5s^2 5p^6$ ;
- 3) [Kr] $4d^{10} 5s^2 5p^6$ ;
- 4) [Kr] $5s^2 5p^5$ .

26. romel ia dariSxanis atomis (As) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $3d^{10} 4s^2 4p^6$ ;
- 2) [Ar] $3d^{10} 4s^2 4p^3$ ;
- 3) [Ar] $3d^{14} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s^2 4p^5$ .

27. romel ia arsenid-ionis ( $As^{3-}$ ) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $3d^{10} 4s^2 4p^3$ ;
- 2) [Ar] $3d^{14} 4s^2 4p^5$ ;
- 3) [Ar] $3d^{14} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s^2 4p^6$ . \*

28. romel ia bromis atomis (Br) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $3d^{10} 4s^2 4p^6$ ;
- 2) [Ar] $3d^{14} 4s^2 4p^5$ ;
- 3) [Ar] $3d^{14} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s^2 4p^5$ . \*

29. romel ia bromid-ionis ( $Br^-$ ) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $3d^{10} 4s^2 4p^6$ ;
- 2) [Ar] $3d^{14} 4s^2 4p^5$ ;
- 3) [Ar] $3d^{14} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s^2 4p^5$ .

30. romel ia sel enis atomis (Se) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $3d^{10} 4s^2 4p^4$ ;
- 2) [Ar] $3d^{14} 4s^2 4p^5$ ;
- 3) [Ar] $3d^{14} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s^2 4p^5$ .

31. romel ia sel enid-ionis ( $Se^{2-}$ ) el eqtronul i konfiguracia?

([Ar]=  $1s^2 2s^2 2p^6 3s^2 3p^6$ )

- 1) [Ar] $4d^{10} 4s^2 4p^6$ ;
- 2) [Ar] $3d^{14} 4s^2 4p^5$ ;
- 3) [Ar] $3d^{10} 4s^2 4p^6$ ;
- 4) [Ar]  $3d^{10} 4s$ .

32. CamoTvl il i qvedoneebidan romel i ivseba yvel aze adre?

- 1) 5s;
- 2) 4d;
- 3) 4f;
- 4) 4p. \*

33. CamoTvl il i el ementebidan roml is ionizaciis energiaa yvel aze mcire?

- 1) Mg;
- 2) Ca;
- 3) Sr;
- 4) Ba\*.

34. CamoTvl il i el ementebidan roml is pirveli ionizaciis potencial ia yvel aze didi?

- 1) Li;
- 2) Na;
- 3) K;
- 4) Rb.

35. CamoTvl il i el ementebidan roml is pirveli ionizaciis potencial ia yvel aze didi?

- 1) B; 2) C; 3) N; 4) Ne. \*
36. CamoTvl il i el ementebidan roml is radiusia yvel aze didi?  
1) H; 2) He; 3) Li; \* 4) C.
37. CamoTvl il i el ementebidan roml is radiusia yvel aze didi?  
1) Na; \* 2) Mg; 3) Al; 4) Si.
38. CamoTvl il i nawil akebidan roml is radiusia yvel aze mcire?  
1) Fe; 2) Fe<sup>+</sup>; 3) Fe<sup>2+</sup>; 4) Fe<sup>3+</sup> \*.
39. CamoTvl il i nawil akebidan roml is radiusia yvel aze mcire?  
1) S \*; 2) S<sup>-</sup>; 3) S<sup>2-</sup>; 4) S<sup>3-</sup>.
40. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba d-qvedoneze 7 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; 2) 2; 3) 5/2; 4) 3/2. \*
41. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba d-qvedoneze 5 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; 2) 2; 3) 5/2; \* 4) 0.
42. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba f-qvedoneze 7 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; \* 2) 2; 3) 5/2; 4) 3/2.
43. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba p-qvedoneze 5 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; 2) 2; 3) 5/2; 4) 1/2. \*
44. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba d-qvedoneze 6 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; 2) 2; \* 3) 5/2; 4) 3/2.
45. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba p-qvedoneze 6 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 0; \* 2) 2; 3) 5/2; 4) 3/2.
46. qvemoT CamoTvl il Tagan spinis romel i jamuri mniSvnel oba Seesabameba f-qvedoneze 8 el eqtronis hundis wesis Sesabamisad ganTavsebas?  
1) 7/2; 2) 2; 3) 5/2; 4) 3. \*
47. rogoria Semdegi oTxi qvedonis: (i) 6s, (ii) 4p, (iii) 4d, (iv) 5f Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?  
1) i, ii, iii, iv; 2) ii, i, iii, iv; 3) ii, iii, i, iv; \* 4) iv, ii, i, iii.
48. rogoria Semdegi oTxi qvedonis: (i) 6s, (ii) 4p, (iii) 3d, (iv) 5f Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?  
1) i, ii, iii, iv; 2) iii, ii, i, iv \*; 3) ii, iii, i, iv; 4) iv, ii, i, iii.
49. rogoria Semdegi oTxi qvedonis: (i) 5s, (ii) 4f, (iii) 4d, (iv) 5p Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?  
1) i, ii, iii, iv; 2) i, iii, iv, ii; \* 3) ii, iii, i, iv; 4) iv, ii, i, iii.
50. rogoria Semdegi oTxi qvedonis: (i) 6s, (ii) 5p, (iii) 4f, (iv) 6p Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?  
1) i, ii, iii, iv; 2) ii, i, iii, iv; \* 3) ii, i, iv, iii; 4) iv, ii, i, iii.
51. rogoria Semdegi oTxi qvedonis: (i) 7s, (ii) 5p, (iii) 4d, (iv) 5f Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?  
1) iii, ii, i, iv; \* 2) ii, i, iii, iv; 3) ii, iii, i, iv; 4) iv, ii, i, iii.

52. rogoria Semdegi oTxi qvedonis: (i) 6p, (ii) 4p, (iii) 4d, (iv) 5s Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?

1) i, ii, iii, iv; 2) ii, i, iii, iv; 3) ii, iii, i, iv; 4) ii, iv, iii, i. \*

53. rogoria Semdegi oTxi qvedonis: (i) 5f, (ii) 6p, (iii) 3d, (iv) 4p Sevsebi s Tanamimdevroba kl eCkovskis wesis Sesabamisad?

1) i, ii, iii, iv; 2) ii, i, iii, iv; 3) ii, iii, i, iv; 4) iii, iv, ii, i. \*

54. qvemoT CamoTvl il el ementTagan, romel s gaaCnia gare garsis s-qvedoneze el eqtronebis maqsimal urze nakl ebi raodenoba?

1) Ba; 2) Rh; \* 3) Pb; 4) Ga.

55. qvemoT CamoTvl il el ementTagan, romel s gaaCnia gare garsis s-qvedoneze el eqtronebis maqsimal urze nakl ebi raodenoba?

1) Ba; 2) Mn; 3) Pb; 4) Ag. \*

56. qvemoT CamoTvl il el ementTagan, romel s gaaCnia gare garsis s-qvedoneze el eqtronebis maqsimal urze nakl ebi raodenoba?

1) Cr; \* 2) La; 3) Pb; 4) Ga.

57. qvemoT CamoTvl il el ementTagan, romel s gaaCnia bol oswina Sris mTl ianad Sevsebul i d-qvedone?

1) Cs; 2) Cr; 3) Pd; \* 4) Co.

58. qvemoT CamoTvl il el ementTagan, romel s gaaCnia bol oswina Sris naxebrad Sevsebul i d-qvedone?

1) Ba; 2) Au; 3) Pb; 4) Cr. \*

59. qvemoT CamoTvl il el ementTagan, romel s gaaCnia bol oswina Sris mTl ianad Sevsebul i d-qvedone?

1) Hg; \* 2) Fe; 3) Pt; 4) W.

60. qvemoT CamoTvl il el ementTagan, romel s gaaCnia bol oswina Sris mTl ianad Sevsebul i d-qvedone?

1) Ba; 2) Ag; \* 3) Ta; 4) Ra.

61. romel iRac oTxi el ementis pirvel i ionizaciis energiebia: (i) 6,43 ev; (ii) 4,19 ev; (iii) 5,22 ev (iv) 10,99 ev. qvemoTCamoTvl il Tagan romel i mimdevrobi T Zl ierdeba metal uri Tvissebebi?

1) i<ii<iii<iv; 2) iv<iii<ii<i; 3) iv<i<iii<ii; \* 4) ii<iii<i<iv.

62. romel iRac oTxi el ementis pirvel i ionizaciis energiebia: (i) 6,43 ev; (ii) 4,19 ev; (iii) 5,22 ev; (iv) 10,99 ev. qvemoTCamoTvl il Tagan romel i mimdevrobi T sustdeba metal uri Tvissebebi?

1) i<ii<iii<iv; 2) iv<iii<ii<i; 3) iv<i<iii<ii; 4) ii<iii<i<iv\*.

63. romel iRac oTxi el ementis el eqtronisaken swrafvis energiebia: (i) -100 ev; (ii) 22 ev; (iii) 250 ev (iv) -230 ev. qvemoTCamoTvl il Tagan romel i mimdevrobi T Zl ierdeba arametal uri Tvissebebi?

1) i<ii<iii<iv; 2) iv<iii<ii<i; 3) iv<i<iii<ii; 4) iii<ii<i<iv. \*

64. romel iRac oTxi el ementis pirvel i ionizaciis energiebia: (i) 16,3 ev; (ii) 4,1 ev; (iii) 15,2 ev; (iv) 1,99 ev. qvemoTCamoTvl il Tagan romel i mimdevrobi T Zl ierdeba metal uri Tvissebebi?

1) i<iii<ii<iv; \* 2) iv<iii<ii<i; 3) iv<i<iii<ii; 4) ii<iii<i<iv.

65. romel iRac oTxi el ementis el eqtronisaken swrafvis energiebia:

(i) -1100ev; (ii) 122ev; (iii) 250ev (iv) -30ev. qvemoTCamoTvl il Tagan romel i mimdevrobiT Zl ierdeba arametal uri Tvissebebi?

1) i<ii<iii<iv; 2) iii<ii<iv<i; \* 3) iv<i<iii<ii; 4) ii<iii<i<iv.

66. romel ime oTxi el ementis pirvel i ionizaciis energiebia: (i) 1,43 ev; (ii) 14,19 ev; (iii) 5,212 ev; (iv) 11,099 ev. qvemoTCamoTvl il Tagan romel i mimdevrobiT Zl ierdeba metal uri Tvissebebi?

1) i<ii<iii<iv; 2) iv<iii<ii<i; 3) ii < iv <iii<i; \* 4) ii<iii<i<iv.

67. rogor icvl eba metal uri Tvissebebi Semdeg rigSi: Cu, Ag, Au?

1) Cu>Ag>Au; \* 2) Au>Ag>Cu; 3) Cu>Au>Ag; 4) Au>Cu>Ag.

68. rogor icvl eba arametal uri Tvissebebi Semdeg rigSi: O, S, Cl?

1) O>S>Cl; 2) S>O>Cl; 3) O>Cl>S; \* 4) Cl>O>S.

69. rogor icvl eba arametal uri Tvissebebi Semdeg rigSi: N, F, Cl?

1) N>F>Cl; 2) F>Cl>N; 3) Cl>F>N; 4) F>Cl~N. \*

70. rogor icvl eba metal uri Tvissebebi Semdeg rigSi: B, Al, Mg?

1) Al>B>Mg; 2) Mg>Al>B; \* 3) B>Mg>Al; 4) B>Al>Mg.

71. rogor icvl eba el eqtrouaryofiTobebi Semdeg rigSi: Na, K, Mg?

1) (K)< (Mg)< (Na); 2) (K)< (Na)< (Mg); \* 3) (Mg)< (K)< (Na); 4) (K)= (Na)< (Mg).

72. rogor icvl eba el eqtrouaryofiTobebi Semdeg rigSi: C, Si, P?

1) (C)> (Si)> (P); 2) (P)> (C)> (Si); 3) (C)> (P)> (Si); \* 4) (Si)> (P)> (C).

73. rogor icvl eba atomuri radiusebi Semdeg rigSi: Cs, Na, Au?

1) r(Cs)>r(Na)>r(Au); \* 2) r(Na)>r(Cs)>r(Au);

3) r(Au)>r(Cs)>r(Na); 4) r(Au)>r(Na)>r(Cs).

74. romel i Tvisseba ar axasiaTebis ionur bmas?

1) pol aroba; 2) gaj erebul oba; \* 3) bmis energia; 4) bmis sigrZe.

75. romel i mosazrebaa samarTl iani val enturi bmebis meTodiT?

1) koval enturi bmis warmoqmnisas sistemis energia izrdeba;

2) koval entur bmas warmoqmnis ori el eqtroni paral el uri spinebiT;

3) koval enturi bma l okal izebul ia or atoms Soris; \*

4) mol ekul uri orbital ebi warmoadgens atomuri orbital ebis Sekrebisa da gamokl ebis Sedegs.

76. moyvanil i mosazrebebidan romel ia swori?

1) val enturi bmebis meTodiT bmis jeradoba ganisazRvreba makavSirebel da antimakavSirebel orbital ebze el eqtronebis sxvaobis naxevriT;

2) val enturi bmebis meTodis upiratesoba misi Tval saCinoebaa; \*

3) mol ekul uri orbital ebis meTodiT qimiuri bma yovel Tvis orcentriani da orel eqtroniaia;

4) ionuri bma mimarTul ia atomuri orbital ebis maqsimal uri gadafarvis mxares.

77. CamoTvl il i nawil akebidan romel i ar SeiZl eba arsebobdes mdgrad mdgomareobaSi mom-is Tanaxmad:

1) H<sub>2</sub><sup>+</sup>; 2) HHe; 3) He<sub>2</sub>; \* 4) H<sub>2</sub><sup>-</sup>.

78. rogoria bmis jeradoba N<sub>2</sub><sup>+</sup> mol ekul a-ionSi?

1) 1; 2) 2,5; \* 3) 2; 4) 3.

79. romel i mosazreba aris swori O<sub>2</sub>-is daxasiaTebis sas:

- 1) mol ekul a diamagniturgia, vinaidan mol ekul aSi el eqtronebis wyvil i ricxvia;
  - 2) mol ekul a paramagniturgia, vinaidan mol ekul is jamuri spini nul isagan gansxvavdeba; \*
  - 3) mol ekul aSi bmis j eradoba 1,5-is tol ia, radgan mol ekul a paramagniturgia;
  - 4) mol ekul aSi bmis j eradoba 3-is tol ia.
80. CamoTvl il i ionebidan romel s aqvs yvel aze mcire mapol arizebel i unari?
- 1)  $\text{Na}^+$ ; \*    2)  $\text{Ca}^{2+}$ ;    3)  $\text{Mg}^{2+}$ ;    4)  $\text{Al}^{3+}$ .
81. val entur bmaTa meTodiT SesaZl ebel ia aixsnas:
- 1)  $\text{H}_2^+$ ,  $\text{O}_2^+$ ,  $\text{F}_2^+$  mol ekul a-ionebis arseboba;
  - 2) Jangbadis mol ekul is paramagnituri Tvisebebi;
  - 3) zogierTi mol ekul idan el eqtronis mowvyetisas bmis simtkicis gazrda;
  - 4) mol ekul is sivrciTi aRnagoba. \*
82. CamoTvl il i mosazrebebidan romel ia araswori?
- 1) mol ekul uri orbital i aris tal Ruri funqcia, romel ic gansazRvravs el eqtronis yvel aze saal baTo mdebareobasa da mis energias mol ekul aSi;
  - 2) real uri hibridizacia, rogorc meqanizmi, ar SeiZl eba gamovl indes el ementebSi; \*
  - 3) el eqtronis tal Ruri gantol ebis amonaxsnebi aRweren dasaSveb energetikul mdgomareobebs;
  - 4) ionur bmas axasiaTebis maRal i simtkice.
83. CamoTvl il i mosazrebebidan romel ia araswori?
- 1) hibridizacia aris gansxvavebul i formisa da energiebiT axl os mdgomi atomuri orbital ebis Serwyma erTmaneTTan erTnairi formisa da energiis orbital ebis warmoqmniT.
  - 2) ionizaciis energiit raodenobrivad fasdeba el ementebis qimiuri buneba;
  - 3) el eqtronisadmi swrafva araaRgznebul Tavisufal atomTan el eqtronis mierTebis procesis energetikul i efektia;
  - 4) hibridul i orbital ebi Semotanil ia aral okal uri bmebis aRwerisaTvis, roml ebic sivrcesi garkveul i mimaRTul ebiT ar aris orientirebul i. \*
84. rodesac atomTa val enturi orbital ebis hibridizaciis tipia  $sp^3d$ , mol ekul as aqvs:
- 1) brtyel i trigonal uri forma;    2) tetraedrul i forma;
  - 3) trigonal uri bipiramidis forma; \*    4) oqtaedrul i forma.
85. moyvanil i mosazrebebidan romel ia araswori?
- 1) el eqtronis tal Ruri gantol ebis amonaxsnebi aRwers dasaSveb energetikul mdgomareobebs;
  - 2) atomuri orbital ebis gamokl ebiT miReba antimakavSirebel i mol ekul uri orbital i;
  - 3) antimakavSirebel i da aramakavSirebel i mol ekul uri orbital i gansxvavebul i cnebebia.
  - 4) hibridizacia aris erTnairi formisa da energiebiT axl os mdgomi atomuri orbital ebis Serwyma erTmaneTTan erTnairi formisa da energiis orbital ebis warmoqmniT. \*
86. moyvanil i mosazrebebidan romel ia araswori?

1) real uri hibridizacia, rogorc meqanizmi, vl indeba meore periodis el ementebSi;

2) aramakavSirebel i mol ekul uri orbital is energia nakl ebia antimakavSirebel i orbital is energiaz;

3) hibridizacia aris gansxvavebul i formisa da energiebiT axl os mdgomi atomuri orbital ebis Serwya erTmareTTan erTnairi formisa da energiis orbital ebis warmoqmniT;

4) makavSirebel i mol ekul uri orbital is energia misi warmomqmel i atomuri orbital ebis energiaz metia.\*

87. CO-s mol ekul is mol ekul uri orbital ebis energetikul i diagramaa:  $[(\sigma_{2s})^2(\sigma_{2s}^*)^2(\pi_{2p})^4(\sigma_{2p})^2]$ , roml is mixedviTac SeiZl eba davaskvnaT, rom bmis rigi tol ia:

1) 3-is;\* 2) 1-is; 3) 2-is; 4) 2,5-is.

88. NO-s mol ekul is mol ekul uri orbital ebis energetikul i diagramaa:  $[(\sigma_{2s})^2(\sigma_{2s}^*)^2(\sigma_{2p})^2(\pi_{2p})^4(\pi_{2p}^*)^1]$ , roml is mixedviTac SeiZl eba davaskvnaT, rom bmis rigi tol ia:

1) 1,5-is; 2) 2,5-is;\* 3) 3-is; 4) 2-is.

89. rogoria bmis rigi  $O_2^+$  mol ekul ur ionSi?

1) 1; 2) 1,5; 3) 2; 4) 2,5.\*

90. NO-s mol ekul is mol ekul uri orbital ebis energetikul i diagramaa:  $[(\sigma_{2s})^2(\sigma_{2s}^*)^2(\sigma_{2p})^2(\pi_{2p})^4(\pi_{2p}^*)^1]$ , roml is mixedviTac SeiZl eba davaskvnaT, rom:

1) azotis val entoba aris 2-is tol i;

2) xorciel deba azotis saval ento orbital ebis  $sp^2$  hibridizacia;

3) mol ekul a diamagniturgia; 4) mol ekul a paramagniturgia.\*

91. CamoTvl il i Zal ebidan romel i aris ganpirobepul i mudmivi dipol ebis arsebobiT?

1) orientaciul i;\* 2) induqciuri;

3) dispersiul i; 4) yvel a.

92. biosistemebSi ar vxvdebiT:

1) peptidur bmas, 2) wyal badur bmas,

3) makroergul bmas, 4) l iTonur bmas;\*

93. romel i nivTierebebis mol ekul ebSi ar gvxxdeba Sigamol ekul uri wyal baduri bma:

1) sal icil mJavas; 2) o-nitrofenolis; 3) wyl is;\* 4) cil ebis.

94. romel i pirobaa araswori atomuri orbital ebis wrfivi kombinaci iT mol ekul uri orbital ebis warmoqmniSas dasacavi pirobebidan?

1) atomur orbital ebs unda gaaCndeT TiTqmis erTnairi energiebi;

2) orbital ebis gadafarva unda moxdes mniSvnel ovani xarisxiT;

3) unda gaaCndeT erTnairi simetria mol ekul aSi bmis xazis mimarT;

4) atomuri orbital ebi unda iyos hibridul i.\*

95. birTvebs Soris manZil i izrdeba:

1) makavSirebel mol ekul ur orbital ebze el eqtronebis ricxvis zrdasTan erTad;

2) antimakavSirebel orbital ebze el eqtronebis ricxvis zrdasTan erTad;\*



- 3) el eqtronebis mowyvetisas antimakavSirebel i orbital idan;
- 4) qimiuri bmis energiis zrdasTan erTad.
96. qimiuri bmis energia mcirdeba:
- 1) makavSirebel mol ekul ur orbital ebze el eqtronebis ricxvis zrdasTan erTad;
- 2) antimakavSirebel orbital ebze el eqtronebis ricxvis zrdasTan erTad;\*
- 3) el eqtronebis mowyvetisas antimakavSirebel i orbital idan;
- 4) birTvebs Soris manZil is SemcirebasTan erTad.
97. Jangbadis mol ekul is paramagnetizmi aixsneba:
- 1) makavSirebel orbital ebze ori gauwyvil ebel i el eqtronis arsebobiT;
- 2) antimakavSirebel orbital ebze ori gauwyvil ebel i el eqtronis arsebobiT;
- \*
- 3) antimakavSirebel orbital ebze erTi gauwyvil ebel i el eqtronis arsebobiT;
- 4) makavSirebel orbital ebze erTi gauwyvil ebel i el eqtronis arsebobiT.
98. moyvanil i mosazrebebidan romel ia swori?
- 1) dipol-dipol uri urTierTqmedeba damokidebul ia mol ekul is pol arizebadobaze;
- 2) qimiuri gardaqmnebis dros aRgznebisas STanTqmul i energia sakmarisia el eqtronis erTi energetikul i donidan meoreze gadasasvl el ad;
- 3) real uri mol ekul is energia metia rezonansul i struqturis energiaze;
- 4) benzol is rezonansul hibridSi bmis j eradoba 1,5-is tol ia.\*
99. moyvanil i ganmartebesidan romel ia swori karbonat-ionisTvis?
- 1) bmis j eradoba 3/4-is tol ia;
- 2) TiToeul Jangbadis atomze muxti -2-is tol ia;
- 3) samive C-O bmas aqvs erTnairi sigrZe;\*
- 4) el eqtronul i simkvrivis ganawil eba gamoisaxeba oTxi rezonansul i formul iT.
100. moyvanil i ganmartebesidan romel ia swori hidrofosfat-ionisTvis?
- 1) bmis j eradoba 5/4-is tol ia;\*
- 2) TiToeul Jangbadis atomze muxti -3/2-is tol ia;
- 3) oTxive bmas fosforisa da Jangbadis atomebs Soris aqvs erTnairi sigrZe;
- 4) el eqtronul i simkvrivis ganawil eba gamoisaxeba oTxi rezonansul i formul iT.
101. moyvanil i mosazrebebidan romel ia swori?
- 1) bmis warmoqmnisas atomebs Soris el eqtronul i simkvrivis zrda sistemis energiis zrdas ganapirobebs;
- 2) liTonuri bma warmoiqmneba val enturi el eqtronebis srul i del okal izaci iT;
- 3) kul onur Zal ebs aqvT gaj erebul obis Tviseba;
- 4) mol ekul uri orbital i aris tal Ruri funqcia, romel ic gansazRvravs el eqtronis yvel aze saal baTo mdebareobas mocemul energetikul doneze mol ekul aSi.\*
102. CamoTvl il i mol ekul ebidan romel s aqvs rezonansul i struqturibi?
- 1) H<sub>2</sub>O; 2) SO<sub>3</sub>; \* 3) CH<sub>4</sub>; 4) CS<sub>2</sub>.

103. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{H}_2\text{O}$ , (iii)  $\text{P}_2\text{O}_5$  (iv)  $\text{O}_2$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (P)=2,1; (O)=3,5? 1)ida ii; 2)ida iv;\* 3)arcerTi; 4)mxol od iv.

104. ganvixil oT Semdegi nawil akebi: (i)  $\text{As}_2\text{S}_3$ , (ii)  $\text{H}_2\text{S}$ , (iii)  $\text{CS}_2$  (iv)  $\text{H}_2$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (S)=2,5; (C)=2,5; (As)=2,0?

1)iii da iv;\* 2)ida iv; 3)arcerTi; 4)mxol od iv.

105. ganvixil oT Semdegi nawil akebi: (i)  $\text{NCl}_3$ , (ii)  $\text{N}_2\text{O}_3$ , (iii)  $\text{NH}_3$  (iv)  $\text{N}_2$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (N)=3,0; (O)=3,5; (Cl)=3,0?

1)arcerTi; 2)ida iv;\* 3)ii da iii; 4)mxol od iv.

106. ganvixil oT Semdegi nawil akebi: (i)  $\text{PCl}_3$ , (ii)  $\text{HClO}$ , (iii)  $\text{HClO}_3$  (iv)  $\text{HCl}$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (P)=2,1; (O)=3,5; (Cl)=3,0?

1)arcerTi;\* 2)ida iv; 3)ii da iii; 4)mxol od iv.

107. ganvixil oT Semdegi nawil akebi: (i)  $\text{BCl}_3$ , (ii)  $\text{HCl}$ , (iii)  $\text{B}_2\text{O}_3$  (iv)  $\text{AsB}$ . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (B)=2,0; (O)=3,5; (Cl)=3,0; (As)=2,0?

1)ida ii; 2)ida iv; 3)ii da iii; 4)mxol od iv.\*

108. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{AsB}$ , (iii)  $\text{H}_2\text{O}$  (iv)  $\text{H}_2$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (P)=2,1; (O)=3,5?

1)i,ii da iv;\* 2)ida iv; 3)ii da iii; 4)mxol od iv.

109. ganvixil oT Semdegi nawil akebi: (i)  $\text{H}_2\text{S}$ , (ii)  $\text{H}_2\text{O}$ , (iii)  $\text{SO}_2$  (iv)  $\text{SO}_3$  . romel maTganSia arapol arul -koval enturi bma, Tu Sesabamisi el eqtrouaryofiTobebis ricxviTi mniSvnel obebia: (H)=2,1; (S)=2,5; (O)=3,5?

1)arcerTi;\* 2)ida iv; 3)ii da iii; 4)mxol od iv.

110. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}_2$  (iv)  $\text{O}_3$  . romel maTganSi SeiniSneba rezonansi?

1)ida ii; 2)ida iv; 3)ii da iii; 4)mxol od iv.\*

111. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{CO}_3^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{O}_2$  . romel maTganSi SeiniSneba rezonansi?

1)ida ii; 2)ida iv; 3)ii da iii; 4)mxol od ii.\*

112. ganvixil oT Semdegi nawil akebi: (i)  $\text{NH}_3$ , (ii)  $\text{SO}_3$ , (iii)  $\text{CO}_3^{2-}$  (iv)  $\text{O}_2$  . romel maTganSi SeiniSneba rezonansi?

1)ida ii; 2)ida iv; 3)ii da iii;\* 4)mxol od iii.

113. ganvixil oT Semdegi nawil akebi: (i)  $\text{OH}_3^+$ , (ii)  $\text{HPO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{Cl}^-$  . romel maTganSi SeiniSneba rezonansi?

1)mxol od ii; \* 2)ida iv; 3)ii da iii; 4)mxol od iv.

114. ganvixil oT Semdegi nawil akebi: (i)  $\text{SO}_3$ , (ii)  $\text{CO}_2$ , (iii)  $\text{ClO}_2^-$  (iv)  $\text{NO}_3^-$  . romel maTganSi SeiniSneba rezonansi?  
 1) i da ii; 2) i da iv; \* 3) ii da iii; 4) mxol od iv.
115. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}_3^-$  (iv)  $\text{O}_3$  . romel maTganSi SeiniSneba rezonansi?  
 1) i da ii; 2) i da iv; 3) iii da iv; \* 4) mxol od iv
116. ganvixil oT Semdegi nawil akebi: (i)  $\text{PO}_3^-$ , (ii)  $\text{HPO}_4^{2-}$ , (iii)  $\text{CS}_2$ , (iv)  $\text{ClO}_3^-$  . romel maTganSi SeiniSneba rezonansi?  
 1) i da ii; \* 2) i da iv; 3) ii da iii; 4) mxol od iv.
117. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}_2$ , (iv)  $\text{H}_2\text{S}$  . romel maTganSi SeiniSneba sp hibridizacia?  
 1) i da ii; 2) mxol od iii\*; 3) mxol od i; 4) iii da iv.
118. ganvixil oT Semdegi nawil akebi: (i)  $\text{OH}_3^+$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$ , (iv)  $\text{H}_2\text{O}$  . romel maTganSi SeiniSneba sp hibridizacia?  
 1) mxol od ii; 2) mxol od iii; \* 3) mxol od iv; 4) iii da iv.
119. ganvixil oT Semdegi nawil akebi: (i)  $\text{NH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}_2$  (iv)  $\text{H}_2\text{C}_2$  . romel maTganSi SeiniSneba  $\text{sp}^3$  hibridizacia?  
 1) i da ii; \* 2) mxol od iii; 3) mxol od i; 4) iii da iv.
120. ganvixil oT Semdegi nawil akebi: (i)  $\text{C}_6\text{H}_6$ , (ii)  $\text{HPO}_4^{2-}$ , (iii)  $\text{CO}_2$ , (iv)  $\text{H}_2\text{S}$  . romel maTganSi SeiniSneba sp hibridizacia?  
 1) mxol od ii; 2) mxol od iii \*; 3) mxol od i; 4) iii da iv.
121. ganvixil oT Semdegi nawil akebi: (i)  $\text{H}_2\text{CO}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{SO}_3^{2-}$  . romel maTganSi SeiniSneba  $\text{sp}^2$  hibridizacia?  
 1) mxol od ii; 2) mxol od iii; 3) mxol od iv; 4) i da iv.\*
122. ganvixil oT Semdegi nawil akebi: (i)  $\text{NH}_4^+$ , (ii)  $\text{SeO}_4^{2-}$ , (iii)  $\text{CO}_2$  (iv)  $\text{O}_2$  . romel maTganSi SeiniSneba  $\text{sp}^3$  hibridizacia?  
 1) mxol od ii; 2) i da ii; \* 3) mxol od iv; 4) iii da iv.
123. ganvixil oT Semdegi nawil akebi: (i)  $\text{NH}_3$ , (ii)  $\text{OH}^-$ , (iii)  $\text{CO}_2$  (iv)  $\text{O}_2$  . romel maTganSi SeiniSneba  $\text{sp}^3$  hibridizacia?  
 1) mxol od ii; 2) i da ii; \* 3) mxol od iv; 4) iii da iv.
124. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{O}_3$  . romel maTganSi SeiniSneba sammagi bma?  
 1) mxol od ii; 2) mxol od iii; \* 3) mxol od iv; 4) iii da iv.
125. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{O}_3$  . romel maTganSi SeiniSneba wil adi rigis bma?  
 1) mxol od ii; 2) mxol od iii; 3) mxol od iv; \* 4) iii da iv.
126. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{O}_3$  . romel maTganSi SeiniSneba mxol od erTmagi bma?  
 1) mxol od ii; 2) i da ii; \* 3) mxol od iv; 4) iii da iv.
127. ganvixil oT Semdegi nawil akebi: (i)  $\text{OH}_3^+$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$  (iv)  $\text{AsB}$  . romel maTganSi SeiniSneba sammagi bma?  
 1) mxol od ii; 2) mxol od iii; 3) mxol od iv; 4) iii da iv.\*

128. ganvixil oT Semdegi nawil akebi: (i)  $\text{AsH}_3$ , (ii)  $\text{SO}_3^{2-}$ , (iii)  $\text{CO}_3^{2-}$ , (iv)  $\text{O}_3$ . romel maTganSi SeiniSneba ormagi bma?

1) ii da iii; \*      2) mxol od iii;      3) mxol od iv;      4) iii da iv.

129. ganvixil oT Semdegi nawil akebi: (i)  $\text{PH}_3$ , (ii)  $\text{SO}_4^{2-}$ , (iii)  $\text{CO}$ , (iv)  $\text{O}_3$ . romel maTganSi SeiniSneba sammagi bma?

1) mxol od ii;      2) mxol od iii; \*      3) mxol od iv;      4) iii da iv.

130. ganvixil oT Semdegi nawil akebi: (i)  $\text{N}_2$ , (ii)  $\text{CO}_3^{2-}$ , (iii)  $\text{CO}_2$  (iv)  $\text{PB}$ . romel maTganSi SeiniSneba sammagi bma?

1) mxol od ii; 2) mxol od iii; 3) mxol od iv; 4) i da iv.\*

131. kompl eqsuria naerTi, romel Sic aris Tundac erTi:

1) ionuri bma; 2) arapol arul -koval enturi bma; 3) metal uri bma;

4) donorul -aqceptorul i meqanizmiT danyarebul i bma.\*

132. I igandis dentatoba ganisazRvreba:

1) I igandis donorul atomTa ricxviT;\*

2) I igandis muxtiT;

3) I igandis mJavurobiT an fuZianobiT;

4) Siga sferoSi arsebul i I igandebis ricxviT.

133. I igandis koordinaciul i tevadoba ganisazRvreba:

1) im adgil ebis ricxviT, romel sac I igandi ikavebs sakoordinacio sferoSi;\*

2) I igandebis raodenobiT sakoordinacio sferoSi;

3) I igandis mier mikavSirebul i kompl eqswarmomqmel is ricxviT;

4) I igandis mocul obiT.

134. qvemoT CamoTvl il i koordinaciul i naerTebidan romel rigSia mxol od neitral uri kompl eqsnaerTebi?

1)  $[\text{Cr}(\text{H}_2\text{O})_5\text{Cl}]\text{Cl}_2$ ,  $[\text{Pt}(\text{NH}_3)_2(\text{H}_2\text{O})\text{OH}]\text{NO}_2$ ,  $\text{K}_2[\text{BeF}_4]$ ;

2)  $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$ ,  $[\text{Ag}(\text{NH}_3)_2]\text{OH}$ ,  $\text{K}_2[\text{Zn}(\text{OH})_4]$ ;

3)  $[\text{Ni}(\text{CO})_4]$ ,  $[\text{Fe}(\text{CO})_5]$ ,  $[\text{Cr}(\text{NH}_3)_3(\text{SCN})_3]$ ;

4)  $[\text{Fe}(\text{CO})_5]$ ,  $\text{K}_3[\text{Fe}(\text{CN})_6]$ ,  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ .

135. qvemoT CamoTvl il romel rigSia mxol od kompl eqsuri mJavebi?

1)  $\text{Li}[\text{AlH}_4]$ ,  $\text{H}[\text{AuCl}_4]$ ,  $\text{H}_2[\text{BeF}_4]$ ;

2)  $\text{H}_2[\text{BeF}_4]$ ,  $\text{H}_2[\text{SiF}_6]$ ,  $\text{H}[\text{AuCl}_4]$ ;

3)  $\text{H}[\text{AuCl}_4]$ ,  $\text{K}_3[\text{Fe}(\text{CN})_6]$ ,  $\text{Li}[\text{AlH}_4]$ ;

4)  $\text{H}[\text{AuCl}_4]$ ,  $\text{Li}[\text{AlH}_4]$ ,  $[\text{Ag}(\text{NH}_3)_2]\text{OH}$ .

136. qvemoT moyvanil i gantol ebebidan romel SemTxvevaSi gamoiyofa nal eqi -  $\text{AgCl}$ ?

1)  $[\text{Cr}(\text{OH}_2)_2(\text{NH}_3)_2\text{Cl}_2]\text{NO}_2 + \text{AgNO}_3 \rightarrow$

2)  $\text{Na}_3[\text{CrCl}_6] + \text{AgNO}_3 \rightarrow$

3)  $[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_2](\text{NO}_2) + \text{AgNO}_3 \rightarrow$

4)  $[\text{Cr}(\text{H}_2\text{O})_2\text{Cl}_2(\text{NH}_3)_2]\text{Cl} + \text{AgNO}_3 \rightarrow *$

137. qvemoT moyvanil romel rigSia mxol od monodentaturi I igandebi?

1)  $\text{NO}_3^-$ ;  $\text{Br}^-$ ;  $\text{NH}_3$ ;  $\text{OH}_2$ ; \*

2)  $\text{NO}_2$ ;  $\text{OH}^-$ ;  $\text{Cl}^-$ ; en;

3)  $\text{OH}_2$ ;  $\text{CN}^-$ ;  $\text{NH}_3$ ;  $\text{C}_2\text{O}_4^{2-}$ ;

4)  $\text{OH}_2$ ;  $\text{CN}^-$ ; en;  $\text{OH}^-$ .

138. mxol od bidentatur I igandebis Seicavs rigi:

- 1)  $\text{H}_2\text{O}$ ,  $\text{NH}_2\text{-CH}_2\text{-CH}_2\text{-NH}_2$ ;  $\text{SO}_4^{2-}$ ;  $\text{C}_2\text{O}_4^{2-}$ ;  $\text{CO}_3^{2-}$ ;
- 2)  $\text{SO}_4^{2-}$ ;  $\text{C}_2\text{O}_4^{2-}$ ;  $\text{CO}_3^{2-}$ ;  $\text{SCN}^-$ ;  $\text{NH}_2\text{-(CH}_2\text{)}_2\text{-COOH}$ ;
- 3)  $\text{NH}_2\text{-CH}_2\text{-CH}_2\text{-NH}_2$ ;  $\text{NH}_2\text{-CH}_2\text{-COOH}$ ;  $\text{NO}_2^-$ ;  $\text{SO}_4^{2-}$ ;  $\text{C}_2\text{O}_4^{2-}$ ;
- 4) en,  $\text{NH}_2\text{-CH}_2\text{-COOH}$ ;  $\text{C}_2\text{O}_4^{2-}$ ;  $\text{NH}_2\text{-(CH}_2\text{)}_2\text{-COOH}$ ;  $\text{NH}_2\text{-(CH}_2\text{)}_4\text{-NH}_2$ .\*

139. ra gansazRvravs kompl eqsis geometrias?

- 1) Siga sferoSi I igandebis ricxvi;
- 2) central uri atomis orbital ebis ricxvi;
- 3) kompl eqswarmomqmnel is hibridizaciis tipi.\*
- 4) kompl eqswarmomqmnel is muxtis mniSvnel oba.

140. I igandis bunebis mixedviT ar arCeven:

- 1) aqvakompl eqsebs;
- 2) hidroqsokompl eqsebs;
- 3) acidokompl eqsebs;
- 4) kationur kompl eqsebs.\*

141. daasaxel eT nivTiereba:  $[\text{Pt}(\text{NH}_3)_3\text{Cl}]\text{NO}_3$

- 1) ql oronitratotriaminpl atina;
- 2) pl atina(IV)-is triaminql oronitrati;
- 3) triaminql oropl atina(II)-is nitrati;\*
- 4) triaminpl atina(II)-is ql orid-nitrati.

142. daasaxel eT nivTiereba:  $[\text{Cr}(\text{H}_2\text{O})_2(\text{OH})_2]\text{Cl}$ :

- 1) diaqvadihidroqsiql oroqromi;
- 2) diaqvadihidroqsiqrom(III)-is ql oridi; \*
- 3) ql orodihidroqsi diaqvaqromi (III);
- 4) diaqvadihidroqsiql oroqromati (III).

143. daasaxel eT nivTiereba:  $\text{Na}[\text{Co}(\text{NH}_3)_2(\text{NO}_2)_4]$ :

- 1) tetrani trodiaminokobal t(II)-is natriumis maril i;
- 2) natriumis diamintetrani trokobal ti (III);
- 3) natriumis tetrani trodiaminokobal ti (III);
- 4) natriumis diamintetrani trokobal tati (III).\*

144. daasaxel eT nivTiereba:  $\text{Na}_2[\text{Co}(\text{CN})_3\text{Cl}]$

- 1) natriumis ql orotricianokobal ti (II);
- 2) natriumis ql orotricianokobal tati (II); \*
- 3) natriumis tricianokobal t(II)-is ql oridi;
- 4) ql orotricianonatriumis kobal tati (II).

145. formul a kompl eqsuri nivTierebisa, roml is saxel wodebaa kal ciumis pentanitroql oropl atinati (IV), aris:

- 1)  $\text{Ca}[\text{PtCl}(\text{NO}_2)_5]$ ; \*
- 2)  $\text{Ca}_2[\text{PtCl}(\text{NO}_2)_5]$ ;
- 3)  $\text{Pt}[\text{CaCl}(\text{NO}_2)_5]$ ;
- 4)  $\text{Pt}[\text{Ca}(\text{ClNO}_2)_5]$ .

146. formul a kompl eqsuri nivTierebisa, roml is saxel wodebaa triaminaqvadiql orokobal t(III)-is ql oridi, aris:

- 1)  $[\text{Co}(\text{NO}_2)_3(\text{H}_2\text{O})\text{Cl}]\text{Cl}_2$ ;
- 2)  $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})\text{Cl}]\text{Cl}_2$ ;
- 3)  $[\text{Co}(\text{NO}_2)_3(\text{H}_2\text{O})\text{Cl}_2]\text{Cl}$ ;
- 4)  $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})\text{Cl}_2]\text{Cl}$ .\*

147. formul a kompl eqsuri nivTierebisa, roml is saxel wodebaa kal iumis oqtacianomol ibdati (IV), aris:

- 1)  $\text{K}_4[\text{Mo}(\text{CN})_6]$ ;
- 2)  $\text{K}_4[\text{Mo}(\text{CN})_8]$ ;
- 3)  $\text{K}_2[\text{Mo}(\text{CN})_4]$ ;
- 4)  $\text{K}_2[\text{Co}(\text{CN})_8]$ .

148.  $[\text{Co}(\text{NH}_3)_5\text{H}_2\text{O}]\text{Br}_3$  kompl eqsuri naerTis saxel wodebaa:

- 1) pentaamini hidrokobal t(II)-is bromidi

- 2) pentaaminaqvakobal t(III)-is bromidi \*
- 3) pentaaminaqvakobal t(II)-is bromidi
- 4) pentaaminhidrokobal t(III)-is bromidi
149.  $K[Fe(CN)_4(H_2O)_2]$  kompl eqsuri naerTis saxel wodebaa:
- 1) kaliumis diaqvateetracianoferati(II);
- 2) kaliumis diaqvateetracianorkina(II);
- 3) kaliumis diaqvateetracianoferati(III);\*
- 4) kaliumis diaqvateetracianorkina(III)
150.  $[CuCl_4]^{3-}$  kompl eqsuri ionis saxel wodebaa:
- 1) tetraql orokuprati(II); 2) tetraql orospil enZi(II);
- 3) tetraql orokuprati(I);\* 4) tetraql orospil enZi(I).
151.  $Na_2[Zn(CN)_4NH_3H_2O]$  kompl eqsuri naerTis saxel wodebaa:
- 1) natriumis aminaqvateetracianoTuTia;
- 2) natriumis aminaqvacianocinkati;
- 3) dinatriumis aminaqvacianocinkati;
- 4) natriumis aminaqvateetracianocinkati.\*
152.  $[Co(NH_3)_4(H_2O)_2]Cl_3$  kompl eqsuri naerTis saxel wodebaa:
- 1) tetraamindiaqvakobal t(III)-is ql oridi;
- 2) pentaaminaqvakobal t(III)-is ql oridi; \*
- 3) tetraaminaqvakobal t(II)-is ql oridi;
- 4) tetraamindiaqvakobal t(III)-is ql oridi.
153.  $Na_2[Fe(CN)_5(H_2O)]$  kompl eqsuri naerTis saxel wodebaa:
- 1) natriumis aqvapentacianoferati(II);
- 2) natriumis aqvapentacianoferati(III);\*
- 3) natriumis aqvapentacianorkina(II);
- 4) natriumis aqvapentacianorkina(III).
154.  $[CuCl_4]^{2-}$  kompl eqsuri ionis saxel wodebaa:
- 1) tetraql orokuprati(II); \* 2) tetraql orospil enZi(II);
- 3) tetraql orokuprati(I); 4) tetraql orospil enZi(I).
155.  $K[Zn(CN)_3NH_3(H_2O)_2]$  kompl eqsuri naerTis saxel wodebaa:
- 1) kaliumis amindiaqvatriciananoTuTia;
- 2) kaliumis aminaqvatriacianoTuTia;
- 3) kaliumis amindiaqvatricianocinkati; \*
- 4) kaliumis aminaqvatricianocinkati.
156. qvemoT CamoTvl il romel ionSi gv xvdeba  $sp^3d^2$  tipis hibridizacia?
- 1)  $[BeF_4]^{2-}$ ; 2)  $[Co(en)_3]^{3+}$ ;\* 3)  $[CuCl_4]^{2-}$ ; 4)  $[Ag(NH_3)_2]^+$ .
157. rogori hibridizaciis mdgomareobaSi imyofeba  $Be^{2+}$  ioni  $[BeCl_4]^{2-}$  kompl eqsur anionSi?
- 1)  $sp^2$ ; 2)  $sp$ ; 3)  $sp^3d^2$ ; 4)  $sp^3$ .\*
158. oqtaedrul i konfiguracia ar xorciel deba:
- 1)  $[Co(NH_3)_6]^{2+}$  ionSi; 2)  $[Co(CN)_3Cl]^{2-}$  ionSi; \*
- 3)  $[Co(NH_3)_4(H_2O)_2]^{2+}$  ionSi; 4)  $[Co(en)_3]^{3+}$  ionSi.
159. kompl eqsis mdgradobis dasaxasiaTebel ad Semotanilia  $K_{md}$  – mdgradobis mudmiva, romel ic:

1) warmoadgens kompl eqsnaerTis disociaciis procesis wonasworobis mudmivas;

2) warmoadgens kompl eqsnaerTis warmomqnis procesis wonasworobis mudmivas;\*

3) gviCvenebis ligandebis Soris kavSiris ararsebobas;

4) gansazRvravs kompl eqsis daSi is dros.

160. qvemoT CamoTvl il i rigevidan romel Sia mocemul i hidratul i izomeriis magal iTi?

1)  $[\text{Cr}(\text{H}_2\text{O})_4(\text{NH}_3)_2]\text{Cl}_3$ ;  $[\text{Cr}(\text{H}_2\text{O})_3(\text{NH}_3)_3]\text{Cl}_3$ ;

2)  $[\text{Co}(\text{NO}_2)(\text{H}_2\text{O})_5]\text{Cl}_2$ ;  $[\text{Co}(\text{NO}_2)(\text{H}_2\text{O})_4\text{Cl}]\text{Cl}\cdot\text{H}_2\text{O}$ ;

3)  $[\text{Zn}(\text{NH}_3)_2(\text{H}_2\text{O})_2]\text{Cl}_2$ ;  $[\text{Zn}(\text{NH}_3)(\text{H}_2\text{O})_3]\text{Cl}_2$ ;

4)  $[\text{Cr}(\text{H}_2\text{O})_2(\text{NH}_3)_2]\text{Cl}_3$ ;  $[\text{Cr}(\text{H}_2\text{O})_2(\text{NH}_3)_2\text{Cl}_2]\text{Cl}\cdot 2\text{H}_2\text{O}$ .

161. qvemoT CamoTvl il i ligandebidan romel ia heqsadentaturi?

1) porfini; 2) en; 3)  $\text{C}_2\text{O}_4^{2-}$ ; 4)  $\text{EDTA}^{4-}$ .\*

162. porfirinis dianioni aris:

1) bidentaturi ligandi; 2) tridentaturi ligandi;

3) tetradentaturi ligandi; \* 4) heqsadentaturi ligandi.

163. eTil endiamintetraacetati aris:

1) bidentaturi ligandi; 2) tridentaturi ligandi;

3) tetradentaturi ligandi; 4) heqsadentaturi ligandi.\*

164. romel i naerTebia erTmaneTis izomerul ebi?

1)  $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})_3]\text{Cl}_3$ ;  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}\cdot 3\text{H}_2\text{O}$ ;

2)  $[\text{Co}(\text{OH}_2)_5\text{NO}_3]\text{Cl}_2\cdot\text{H}_2\text{O}$ ;  $[\text{Co}(\text{NO}_3)_3(\text{H}_2\text{O})_2\text{Cl}]\text{Cl}\cdot 3\text{H}_2\text{O}$ ;

3)  $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})\text{Cl}_2]\text{NO}_3\cdot 3\text{H}_2\text{O}$ ;  $[\text{Co}(\text{NH}_3)_2(\text{H}_2\text{O})_2\text{Cl}(\text{NO}_3)]\text{Cl}\cdot 3\text{H}_2\text{O}$ ;

4)  $[\text{Co}(\text{NH}_3)_2(\text{H}_2\text{O})_3\text{Cl}]\text{NO}_3\cdot 2\text{H}_2\text{O}$ ;  $[\text{Co}(\text{H}_2\text{O})_3(\text{NH}_3)_2\text{NO}_3]\text{Cl}\cdot 2\text{H}_2\text{O}$ .\*

165. risi tolia hemis Semadgenl obaSi Semaval i  $\text{Fe}^{2+}$ ionis koordinaciul i ricxvi?

1) 4; 2) 6; \* 3) 8; 4) 2.

166. kompl eqswarmomqnel is koordinaciul i ricxvi ganisazRvreba:

1) kompl eqswarmomqnel Tan koordinirebul i ligandebis ricxviT;

2) kompl eqswarmomqnel Tan koordinirebul i ligandebis muxtebis j amiT;

3) gare koordinaciul i sferos muxtis sididiT;

4) kompl eqswarmomqnel Tan koordinirebul i ligandebis atomebis saerTo raodenobiT.\*

167. romel i ligandebi warmomqnis kompl eqswarmomqnel Tan yvel aze mdgrad kavSirebs?

1) monodentaturi ligandebi; 2) bidentaturi ligandebi;

3) Sereul i dentatobis ligandebi; 4) polidentaturi ligandebi.\*

168. koordinaciul naerTSi —  $\text{Ca}_3[\text{Co}(\text{S}_2\text{O}_3)_3]_2$  ras udris Co(III)-is koordinaciul i ricxvi?

1) 3; 2) 6; \* 3) 4; 4) 8.

169. anionuria koordinaciul i naerTi, romel Sic:

1) kompl eqswarmomqnel Tan koordinirebul ia neutral uri ligandebi;

2) kompl eqswarmomqnel is irgvl iv koordinirebul ia anionuri ligandebi;

3) kaTionuri kompl eqswarmomqnel is muxtisa da anionuri ligandebis muxtebis j ami dadebiTi sididea;

4) kompl eqswarmomqmnel is muxtisa da anionuri l igandebis muxtebis j ami uaryofiTi sididea. \*

170. ionSi  $[\text{Co}(\text{NH}_3)_2(\text{H}_2\text{O})_2\text{Cl}(\text{NO}_3)]^+$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 4; 2) +2, 6; 3) +3, 4; 4) +3, 6;\*

171. ionSi  $[\text{Cr}(\text{H}_2\text{O})_2(\text{NH}_3)_2\text{Cl}_2]^+$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 4; 2) +2, 2; 3) +3, 4; 4) +3, 6.\*

172. ionSi  $[\text{Fe}(\text{CN})_6]^{4-}$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 4; 2) +2, 6; 3) +3, 4; 4) +3, 6.

173. ionSi  $[\text{Fe}(\text{CN})_6]^{3-}$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 3; 2) +2, 6; 3) +3, 3; 4) +3, 6.\*

174. kompl eqsur naerTSi  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 2; 2) +1, 2; 3) +2, 4; 4) +4, 4.

175. kompl eqsur naerTSi  $[\text{Cd}(\text{en})_2(\text{CN})_2]$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 2; 2) +2, 4; 3) +2, 6; 4) +4, 6.

176. kompl eqsur naerTSi  $[\text{Co}(\text{NH}_3)_3(\text{H}_2\text{O})_3]\text{Cl}_3$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 2; 2) +2, 4; 3) +3, 6; 4) +4, 6.

177. kompl eqsur naerTSi  $\text{K}[\text{Fe}(\text{CN})_4(\text{H}_2\text{O})_2]$  kompl eqswarmomqmnel is Jangvis xarisxi da koordinaciul i ricxvia:

1) +2, 2; 2) +2, 4; 3) +2, 6; 4) +3, 6.\*

178. kompl eqsebi qel aturia, Tu:

1) l igandebi monodentaturia;

2) kompl eqswarmomqmnel i bi- an pol identatur l igandTan cikl s warmomqmnis;\*

3) l igandebi el eqtronul i wyvil ebiT amyareben bmas;

4) kompl eqswarmomqmnel i gansxvavebul l igandebis ukavSirdeba.

179. ra aris qel atoTerapiis arisi?

1) qel aturi kompl eqsebis warmomqmnis;

2) toqsikur l iTonebTan mdgradi, wyal Si xsnadi kompl eqsebis warmomqmnis;\*

3) biol igandebiT kompl eqswarmomqmnis;

4) biometal ebiT kompl eqswarmomqmnis.

180. romel hibridul mdgomareobaSia Ag  $[\text{Ag}(\text{NH}_3)_2]^+$  kompl eqsur ionSi?

1)  $sp^3$  2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$

181. romel hibridul mdgomareobaSia Zn  $[\text{Zn}(\text{NH}_3)_4]^{2+}$  kompl eqsur ionSi?

1)  $sp^3$  2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$

182. romel hibridul mdgomareobaSia Hg  $[\text{HgI}_4]^{2-}$  kompl eqsur ionSi?

1)  $sp^3$  2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$

183. romel hibridul mdgomareobaSia Co  $[\text{CoF}_6]^{3-}$  kompl eqsur ionSi?

1)  $sp^3$  2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$  \*

184. romel hibridul mdgomareobaSia Cr  $[\text{Cr}(\text{NH}_3)_6]^{3+}$  kompl eqsur ionSi?



1)  $sp^3$  2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$  \*

185. romel hibridul mdgomareoba Sia Be  $[BeF_4]^{2-}$  kompl eqsur ion Si?

1)  $sp^3$  \* 2)  $sp$  3)  $sp^3d$  4)  $sp^3d^2$

186. romel hibridul mdgomareoba Sia Pt  $[Pt(NH_3)_4]^{2+}$  kompl eqsur ion Si?

1)  $sp^3$  2)  $sp$  3)  $sp^2d$  \* 4)  $sp^3d^2$

187. romel i Rac reacii sa Tvis moqmed masa Ta kanoni Caiwereba, rogorc  $v = kC_A^2C_B^{2.5}$ . qvemo T Camo Tvl il Tagan romel i debul ebaa samar TI iani am reacii sa Tvis?

1) pirvel i reagentis yovel i 2 mol ekul a erTdroul ad urTierTqmedebs meore reagentis 2,5 mol ekul asTan;

2) pirvel i reagentis yovel i 4 mol ekul a erTdroul ad urTierTqmedebs meore reagentis 5 mol ekul asTan;

3) reagentebs ar Sei ZI eba hqondeT wil aduri rigi;

4) es reacii a rTul i meqanizmi T mimdinareobs.\*

188. qvemo T Camo Tvl il Tagan romel i debul ebaa samar TI iani?

1) reacii si Cqaris konstanta araa damokidebul i reacii si pirobebze;

2) reagentebs mol ekul ebs Soris yovel i Sej axebe ar iwvevs produqtis warmoqmnas;\*

3) el ementarul i reaciebi ufro gavrcel ebul ia, vidre mra val stadiani;

4) katal izatori ar cvl is homogenuri reacii si meqanizms.

189. qvemo T Camo Tvl il Tagan romel i debul ebaa arasamar TI iani?

1) reacii si Cqaris konstanta damokidebul ia reacii si pirobebze;

2) reagentebs mol ekul ebs Soris yovel i Sej axebe ar iwvevs produqtis warmoqmnas;

3) el ementarul i reaciebi ufro gavrcel ebul ia, vidre mra val stadiani;\*

4) katal izatori cvl is homogenuri reacii si meqanizms.

190. qvemo T Camo Tvl il Tagan romel i debul ebaa arasamar TI iani?

1) reacii si Cqaris konstanta araa damokidebul i reacii si pirobebze;\*

2) reagentebs mol ekul ebs Soris yovel i Sej axebe ar iwvevs produqtis warmoqmnas;

3) el ementarul i reaciebi nakl eb gavrcel ebul ia, vidre mra val stadiani;

4) katal izatori regenerirdeba homogenuri reacii si daskvni T stadiaze.

191. qvemo T Camo Tvl il Tagan romel i debul ebaa arasamar TI iani?

1) reacii si Cqaris konstanta damokidebul ia reacii si pirobebze;

2) reagentebs mol ekul ebs Soris Ti Toeul i Sej axebe iwvevs produqtis warmoqmnas;\*

3) mra val stadiani reaciebi ufro gavrcel ebul ia, vidre el ementarul i;

4) katal izatori cvl is homogenuri reacii si meqanizms.

192. romel i Rac homogenuri reacii nel a warimar Teba oTaxis temperaturaze, magram maRal temperaturebze misi si Cqare izrdeba. ra aris mizezi?

1) maRal temperaturebze wonasworobis damyareba aRar xdeba;

2) maRal temperaturebze mol ekul ebs qaoturi Sej axebebis al baToba mcirdeba, xol o mowesrigebul i Sej axebebis a – izrdeba;

3) maRal temperaturebze mol ekul ebs kinetikuri energia mcirdeba;

4) მაშალ ტემპერატურებზე მოლ ეკულ ების კინეტიკური ენერჯია და შეჯ აქეების ალ ბატობა იზრდება.\*

193. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+B \rightleftharpoons C+Q$  (სადაც  $Q$  გამოყოფილი სიტბოს რადენობაა). რას შეცვლის კატალიზატორი?

- 1) როგორც სიტბოს რადენობას, ისე რეაქციის სიყვარეს;
- 2) არც სიტბოს რადენობას და არც რეაქციის სიყვარეს;
- 3) არც სიტბოს რადენობას და არც აქტივაციის ენერჯიას;
- 4) მოლოდ აქტივაციის ენერჯიას, მაგრამ არა სიტბოს რადენობას.\*

194. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+B \rightleftharpoons C$ ; როგორია რეაქციის რიგი, ტუ მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A$ ?

- 1) პირველი რიგის;
- 2) ნული ოვანი რიგის;
- 3) ფსევდოპირველი რიგის;\*
- 4) მოკმედ მასატა კანონის ცანავერი მოცემული რეაქციისატვის მკდარია.

195. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+2B \rightleftharpoons C$ ; როგორია რეაქციის რიგი, ტუ მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A C_B$ ?

- 1) მეორე რიგის;\*
- 2) ნული ოვანი რიგის;
- 3) ფსევდოპირველი რიგის;
- 4) მოკმედ მასატა კანონის ცანავერი მოცემული რეაქციისატვის მკდარია.

196. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $2A+B \rightleftharpoons C$ ; როგორია რეაქციის რიგი  $A$  რეაგენტისატვის, ტუ მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A C_B$ ?

- 1) პირველი რიგის;\*
- 2) ნული ოვანი რიგის;
- 3) ფსევდოპირველი რიგის;
- 4) მოკმედ მასატა კანონის ცანავერი მოცემული რეაქციისატვის მკდარია.

197. განვიხილ ოტ ჰიპოტეტური ჰომოგენური ელემენტარული რეაქცია:  $A+B \rightleftharpoons C$ ; რა შეიძლება იტყვას რეაქციის რიგის ტაობაზე, ტუ მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A^2 C_B$ ?

- 1) პირველი რიგის;
- 2) მეორე რიგის;
- 3) მესამე რიგის;\*
- 4) მოკმედ მასატა კანონის ცანავერი მოცემული რეაქციისატვის მკდარია.

198. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+2B \rightleftharpoons C$ ; როგორია რეაქციის რიგი  $B$  რეაგენტისატვის, ტუ მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A^2 C_B$ ?

- 1) პირველი რიგის;\*
- 2) მეორე რიგის;
- 3) მესამე რიგის;
- 4) მოკმედ მასატა კანონის ცანავერი მოცემული რეაქციისატვის მკდარია.

199. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+2B \rightleftharpoons C$ ; მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A^2 C_B$ . ამ რეაქციის მსვლი ელ ობის შესახებ კვებოტმოტანილ მოსაზრებატაგან რომელია მკდარი?

- 1) ეს მრავალსტადიანი რეაქციაა;
- 2) ამ რეაქციას გააჩნია სუალედური პროდუქტები;
- 3) ამ რეაქციისატვის მოკმედ მასატა კანონი უნდა ცაივროს, როგორც  $v=kC_A C_B^2$ ;\*
- 4) ეს მესამე რიგის რეაქციაა.

200. განვიხილ ოტ ჰიპოტეტური ჰომოგენური რეაქცია:  $A+2B \rightleftharpoons C$ ; მოკმედ მასატა კანონი მოცემული რეაქციისატვის ცაივრება, როგორც  $v=kC_A C_B^2$ . ამ რეაქციის მსვლი ელ ობის შესახებ კვებოტმოტანილ მოსაზრებატაგან რომელია მკდარი?

- 1) ეს შეიძლება იყოს მრავალსტადიანი რეაქცია;

- 2) am reacȳias SeiZl eba gaaCndes Sual eduri produqtebi;
- 3) gadaWriT SeiZl eba iTqvas, rom es el ementarul i reacȳiaa;\*
- 4) es mesame rigis reacȳiaa.

201. ganvixil oT hipoteturi homogenuri reacȳia:  $A+2B \rightarrow C$ ; moqmed masaTa kanoni mocemul i reacȳiisaTvis Caiwereba, rogorc  $v=kC_A C_B$ . am reacȳiis msvl el obis Sesaxeb qvemoTmotanil mosazrebaTagan romel ia mcdari?

- 1) es mraval stadiani reacȳia;
- 2) am reacȳias SeiZl eba gaaCndes Sual eduri produqtebi;
- 3) gadaWriT SeiZl eba iTqvas, rom es araa el ementarul i reacȳiaa;\*
- 4) es mesame rigis reacȳiaa.\*

202. ganvixil oT hipoteturi homogenuri reacȳia:  $A+B \rightarrow C$ ; romel iRac  $T_1$  temperaturaze moqmed masaTa kanoni mocemul i reacȳiisaTvis Caiwereba, rogorc  $v=kC_A C_B$ , xol o romel iRac  $T_2$  temperaturaze ( $T_1 < T_2$ ) -  $v=kC_A^{0.75} C_B$ . am reacȳiis msvl el obis Sesaxeb qvemoTmotanil mosazrebaTagan romel ia mcdari?

- 1)  $T_2$  temperaturaze es mraval stadiani reacȳiaa;
- 2) gadaWriT SeiZl eba iTqvas, rom es reacȳia saertod araa el ementarul i;\*
- 3)  $T_1$  temperaturaze es SeiZl eba iyos el ementarul i reacȳia;
- 4) temperatura gavl enas axdens reacȳiis meqanizmze.

203. ganvixil oT hipoteturi sametapiani reacȳia. pirvel i etapis aqtivaciis energiaa 1566 kJ/mol i, meore etapis - 200 kJ/mol i, mesame etapis - 192 kJ/mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;\*
- 2) meore etapi;
- 3) mesame etapi;
- 4) am reacȳias ar aqvs mal imitebel i stadia.

204. ganvixil oT hipoteturi sametapiani reacȳia. pirvel i etapis aqtivaciis energiaa 176 kJ/mol i, meore etapis - 185 kJ/mol i, mesame etapis - 179 kJ/mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;
- 2) meore etapi;
- 3) mesame etapi;
- 4) am reacȳias ar aqvs mal imitebel i stadia.\*

205. ganvixil oT hipoteturi sametapiani reacȳia. pirvel i etapis aqtivaciis energiaa 156 kJ/mol i, meore etapis - 2000 kJ/mol i, mesame etapis - 182 kJ/mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;
- 2) meore etapi;\*
- 3) mesame etapi;
- 4) am reacȳias ar aqvs mal imitebel i stadia.

206. ganvixil oT hipoteturi sametapiani reacȳia. pirvel i etapis aqtivaciis energiaa 566 kJ/mol i, meore etapis - 700 kJ/mol i, mesame etapis - 1922 kJ/mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;
- 2) meore etapi;
- 3) mesame etapi;\*
- 4) am reacȳias ar aqvs mal imitebel i stadia.

207. ganvixil oT hipoteturi sametapiani reacȳia. pirvel i etapis aqtivaciis energiaa 166 kJ/mol i, meore etapis - 172 kJ/mol i, mesame etapis - 175 kJ/mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;
- 2) meore etapi;
- 3) mesame etapi;
- 4) am reacȳias ar aqvs mal imitebel i stadia.\*

208. ganvixil oT hipoTeturi sametapiani reaqlia. pirvel i etapis aqtivaciis energiaa 4523 kj /mol i, meore etapis – 2000 kj /mol i, mesame etapis – 1192 kj /mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;\*      2) meore etapi;      3) mesame etapi;  
4) am reaqlias ar aqvs mal imitebel i stadia.

209. ganvixil oT hipoTeturi sametapiani reaqlia. pirvel i etapis aqtivaciis energiaa 66 kj /mol i, meore etapis – 200 kj /mol i, mesame etapis – 12 kj /mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;      2) meore etapi;\*      3) mesame etapi;  
4) am reaqlias ar aqvs mal imitebel i stadia.

210. ganvixil oT hipoTeturi sametapiani reaqlia. pirvel i etapis aqtivaciis energiaa 1122 kj /mol i, meore etapis – 1200 kj /mol i, mesame etapis – 1292 kj /mol i. romel ia mal imitebel i stadia?

- 1) pirvel i etapi;      2) meore etapi;      3) mesame etapi;  
4) am reaqlias ar aqvs mal imitebel i stadia.\*

211. ganvixil oT hipoTeturi sametapiani reaqlia. ra SeiZl eba iTqvas pirvel i etapis aqtivaciis energiaz, Tu meore etapis aqtivaciis energiaa 200 kj /mol i, mesame etapis – 192 kj /mol i da mal imitebel i stadiaa pirvel i etapi?

- 1) pirvel i etapis aqtivaciis energia mniSvel ovdad unda aRematebodes 200 kj /mol s;\*  
2) pirvel i etapis aqtivaciis energia daaxl oebiT unda udrides 200 kj /mol s;  
3) pirvel i etapis aqtivaciis energia mniSvel ovdad mcire unda iyos, vidre 200 kj /mol i;  
4) pirvel i etapis aqtivaciis energia mcired unda aRematebodes 200 kj /mol s.

212. ganvixil oT reaqlia:  $H_2 + I_2 \rightarrow 2HI$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa mcdari?

- 1)  $v = -d[H_2]/dt$ ;      2)  $v = +d[HI]/dt$ ; \*      3)  $v = -d[I_2]/dt$ ;      4)  $v = +d[HI]/2dt$ .

213. ganvixil oT reaqlia:  $2H_2 + O_2 \rightarrow 2H_2O$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa mcdari?

- 1)  $v = -d[H_2]/dt$ ; \*      2)  $v = -d[H_2]/2dt$ ;      3)  $v = -d[O_2]/dt$ ;      4)  $v = +d[H_2O]/2dt$ .

214. ganvixil oT reaqlia:  $2SO_2 + O_2 \rightarrow 2SO_3$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa swori?

- 1)  $v = -d[O_2]/2dt$ ;      2)  $v = +d[SO_3]/dt$ ;      3)  $v = -d[SO_2]/dt$ ;      4)  $v = +d[SO_3]/2dt$ . \*

215. ganvixil oT reaqlia:  $4FeO + O_2 \rightarrow 2Fe_2O_3$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa swori?

- 1)  $v = -d[O_2]/dt$ ; \*      2)  $v = +d[Fe_2O_3]/dt$ ;      3)  $v = -2d[O_2]/dt$ ;      4)  $v = +d[FeO]/2dt$ .

216. ganvixil oT reaqlia:  $2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa mcdari?

- 1)  $v = +d[H_2]/3dt$ ;      2)  $v = +d[AlCl_3]/dt$ ; \*      3)  $v = -d[Al]/2dt$ ;      4)  $v = -d[HCl]/6dt$ .

217. ganvixil oT reaqlia:  $NH_4NO_3 \rightarrow NH_3 + HNO_3$ . qvemoT CamoTvl il Tagan, reaqlia siCqaris romel i gamosaxul ebaa swori?

- 1)  $v = -d[NH_3]/dt$ ;      2)  $v = +d[HI]/dt$ ;      3)  $v = -d[HNO_3]/dt$ ;      4)  $v = +d[NH_3]/dt$ . \*

218. ganvixil oT hipoTeturi reaqlia:  $A + B \rightarrow C + D$ . A-s koncentraciis gaormageba reaqlia siCqares aotxmagebs, rol o B-s koncentraciis gaormageba reaqlia

siCqares daaxl oebiT 1,4-j er zrdis. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=1,4kC_A^2C_B$ ; 2)  $v=5,6kC_A^2C_B$ ; 3)  $v=kC_A^2C_B^{1/2}$ ; \* 4)  $v=kC_A C_B$ .

219. ganvixil oT hipoteturi reaqcia:  $A+B \rightarrow C+D$ . A-s koncentraciis gaormageba reaqciis siCqares aormagebs, rol o B-s koncentraciis gaormageba reaqciis siCqares 4-j er zrdis. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=1,4kC_A^2C_B$ ; 2)  $v=kC_A C_B$ ; 3)  $v=kC_A C_B^{1/2}$ ; 4)  $v=kC_A C_B^2$ . \*

220. ganvixil oT hipoteturi reaqcia:  $A+B \rightarrow C+D$ . A-s koncentraciis gaormageba reaqciis siCqares ar cvl is, rol o B-s koncentraciis gaormageba reaqciis siCqares daax. 1,4-j er zrdis. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=kC_B^{1/2}$ ; \* 2)  $v=2,8kC_A^2C_B$ ; 3)  $v=kC_A C_B^{1/2}$ ; 4)  $v=kC_A C_B$ .

221. ganvixil oT hipoteturi reaqcia:  $A+B \rightarrow C+D$ . A-s koncentraciis gaormageba reaqciis siCqares aotxmagebs, rol o B-s koncentraciis gaormageba reaqciis siCqares ar cvl is. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=kC_A^2C_B$ ; 2)  $v=5,6kC_A^2C_B$ ; 3)  $v=kC_A^2$ ; \* 4)  $v=kC_A C_B$ .

222. ganvixil oT hipoteturi reaqcia:  $A+B \rightarrow C+D$ . A-s koncentraciis gaormageba reaqciis siCqares rvaj er, rol o B-s koncentraciis gaormageba ki reaqciis siCqares daax. 1,7-j er zrdis. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=1,7kC_A^2C_B$ ; 2)  $v=kC_A^3C_B^{3/2}$ ; \* 3)  $v=kC_A^2C_B^{1/2}$ ; 4)  $v=kC_A C_B$ .

223. ganvixil oT hipoteturi reaqcia:  $A+B \rightarrow C+D$ . A-s koncentraciis gaormageba reaqciis siCqares aormagebs, rol o B-s koncentraciis gaotxmageba reaqciis siCqares 16-j er zrdis. qvemoT CamoTvl il Tagan, romel ia am reaqciis moqmed masaTa kanoni?

1)  $v=kC_A^2C_B$ ; 2)  $v=16kC_A^2C_B$ ; 3)  $v=kC_A^2C_B^{1/2}$ ; 4)  $v=kC_A C_B^2$ . \*

224. ganvixil oT hipoteturi reaqcia:  $2A+B \rightarrow C$ . moqmed masaTa kanoni Caiwereba, rogorc  $v=kC_A^{1,5}C_B$ . qvemoT CamoTvl il Tagan, romel i Seesebameba reaqciis j amur rigsa da reaqciis rigs A-s mixedviT?

1) j amuri: 3, A-s mixedviT: 2; 3) j amuri: 2,5; A-s mixedviT: 2;

2) j amuri: 2,5; A-s mixedviT: 1,5; \* 4) j amuri: 3, A-s mixedviT: 1,5.

225. ganvixil oT hipoteturi reaqcia:  $A+2B \rightarrow C$ . moqmed masaTa kanoni Caiwereba, rogorc  $v=kC_A^{2,5}C_B$ . qvemoT CamoTvl il Tagan, romel i Seesebameba reaqciis j amur rigsa da reaqciis rigs A-s mixedviT?

1) j amuri: 3, A-s mixedviT: 2; 3) j amuri: 2,5; A-s mixedviT: 2;

2) j amuri: 2,5; A-s mixedviT: 2,5; 4) j amuri: 3,5, A-s mixedviT: 2,5. \*

226. ganvixil oT hipoteturi reaqcia:  $2A+B \rightarrow 2C$ . moqmed masaTa kanoni Caiwereba, rogorc  $v=kC_A C_B$ . qvemoT CamoTvl il Tagan, romel i Seesebameba reaqciis j amur rigsa da reaqciis rigs A-s mixedviT?

1) j amuri: 3, A-s mixedviT: 2; 3) j amuri: 2; A-s mixedviT: 1; \*

2) j amuri: 2; A-s mixedviT: 1,5; 4) j amuri: 3, A-s mixedviT: 1.

227. განვიხილეთ ჰიპოთეტური რეაქცია:  $2A+4B \rightarrow C$ . მოკმედ მასატა კანონი ცაიწრება, როგორც  $v=kC_A^{1,5}C_B^{3,5}$ . ღწემოტ გამოტვილ ილ ტაგან, რომელი წეწეწბამება რეაქციის  $j$  ამური რისა და რეაქციის რის  $A$ -ს მიწედვიტ?

1)  $j$  ამური: 5,  $A$ -ს მიწედვიტ: 2; 3)  $j$  ამური: 5;  $A$ -ს მიწედვიტ: 1,5; \*

2)  $j$  ამური: 6;  $A$ -ს მიწედვიტ: 1,5; 4)  $j$  ამური: 5,  $A$ -ს მიწედვიტ: 2,5.

228. განვიხილეთ ჰიპოთეტური რეაქცია:  $A+3B \rightarrow C$ . მოკმედ მასატა კანონი ცაიწრება, როგორც  $v=kC_A^{1,5}C_B$ . ღწემოტ გამოტვილ ილ ტაგან, რომელი წეწეწბამება რეაქციის  $j$  ამური რისა და რეაქციის რის  $B$ -ს მიწედვიტ?

1)  $j$  ამური: 4,  $B$ -ს მიწედვიტ: 2; 3)  $j$  ამური: 2,5;  $B$ -ს მიწედვიტ: 3;

2)  $j$  ამური: 2,5;  $B$ -ს მიწედვიტ: 1; \* 4)  $j$  ამური: 2,5,  $A$ -ს მიწედვიტ: 1,5.

229. განვიხილეთ ჰიპოთეტური რეაქცია:  $2A+B \rightarrow C$ . მოკმედ მასატა კანონი ცაიწრება, როგორც  $v=kC_A^{1,5}$ . ღწემოტ გამოტვილ ილ ტაგან, რომელი წეწეწბამება რეაქციის  $j$  ამური რისა და რეაქციის რის  $A$ -ს მიწედვიტ?

1)  $j$  ამური: 3,  $B$ -ს მიწედვიტ: 1; 3)  $j$  ამური: 1,5;  $B$ -ს მიწედვიტ: 0; \*

2)  $j$  ამური: 2,5;  $B$ -ს მიწედვიტ: 0,5; 4)  $j$  ამური: 3,  $B$ -ს მიწედვიტ: 1,5.

230. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $A+B \rightarrow C+D$ ; (II ეტაპი)  $D+A \rightarrow C+E+B$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; 2)  $B$ ; \* 3)  $D$ ; 4)  $E$ .

231. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $A \rightarrow C+D$ ; (II ეტაპი)  $D+E \rightarrow C+B$ . (III ეტაპი)  $D+B \rightarrow C$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; 2)  $B$ ; 3)  $D$ ; 4) არცერთი. \*

232. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $A \rightarrow C+D$ ; (II ეტაპი)  $D+E \rightarrow C+B$ . (III ეტაპი)  $D+B \rightarrow E$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; 2)  $B$ ; 3)  $D$ ; 4)  $E$ . \*

233. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $B \rightarrow C+D$ ; (II ეტაპი)  $D+A \rightarrow C+E$ . (III ეტაპი)  $D+B \rightarrow E+A$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; \* 2)  $B$ ; 3)  $D$ ; 4)  $E$ .

234. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $A+F \rightarrow C$ ; (II ეტაპი)  $C+A \rightarrow D+E+F$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; 2)  $F$ ; \* 3)  $D$ ; 4)  $E$ .

235. განვიხილეთ ჰომოგენური რეაქციები: (I ეტაპი)  $A+B \rightarrow C+D$ ; (II ეტაპი)  $D+A \rightarrow C+E$ . რომელია ამ პროცესის კატალიზატორი?

1)  $A$ ; 2)  $B$ ; 3)  $D$ ; 4) არცერთი. \*

236. ტუ არენიუსის განტოლ ებას წარმოადგენს წარწვიწრის წრეწრე  $(y=ax+b)$ , ღწემოტ გამოტვილ ილ ტაგან რომელი წეწეწბამება  $y$ -ს?

1)  $\ln A$ ; 2)  $\ln k$ ; \* 3)  $-E_a/RT$ ; 4)  $E_a/RT$ .

237. ტუ არენიუსის განტოლ ებას წარმოადგენს წარწვიწრის წრეწრე  $(y=ax+b)$ , ღწემოტ გამოტვილ ილ ტაგან რომელი წეწეწბამება  $x$ -ს?

1)  $\ln A$ ; 2)  $\ln k$ ; 3)  $1/T$ ; \* 4)  $E_a/RT$ .

238. ტუ არენიუსის განტოლ ებას წარმოადგენს წარწვიწრის წრეწრე  $(y=ax+b)$ , ღწემოტ გამოტვილ ილ ტაგან რომელი წეწეწბამება  $b$ -ს?

1)  $\ln A$ ; \* 2)  $\ln k$ ; 3)  $-E_a/RT$ ; 4)  $E_a/RT$ .

239. Tu areniusis gantol ebas warmovadgenT wrfivi saxiT ( $y=ax+b$ ), qvemoT CamoTvl il Tagan romel i Seesabameba a-s?

1)  $\ln A$ ; 2)  $\ln k$ ; 3)  $-E_a/RT$ ; 4)  $-E_a/R$ . \*

240. areniusis gantol ebas mixedviT, rogor Seicvl eba reaqciis siCqaris konstanta, Tu aqtivaciis energia Semcirdeba?

1) gairdeba; \* 2) Semcirdeba; 3) ar Seicvl eba; 4) kanonzomiereba ar Seini Sneba.

241. areniusis gantol ebas mixedviT, rogor Seicvl eba reaqciis siCqaris konstanta, Tu temperatura Semcirdeba 20K-iT?

1) gairdeba; 2) Semcirdeba; \* 3) ar Seicvl eba; 4) kanonzomiereba ar Seini Sneba.

242. qvemoT CamoTvl il Tagan, romel ia pirvel i rigis reaqciis siCqare integral uri formiT?

1)  $C_A = -kt + C_{0,A}$ ; 2)  $\log C_A = -kt/2,303 + \log C_{0,A}$ ; \* 3)  $1/C_A = kt + 1/C_{0,A}$ ; 4) arcerTi.

243. qvemoT CamoTvl il Tagan, romel ia nul ovani rigis reaqciis siCqare integral uri formiT?

1)  $C_A = -kt + C_{0,A}$ ; \* 2)  $\log C_A = -kt/2,303 + \log C_{0,A}$ ; 3)  $1/C_A = kt + 1/C_{0,A}$ ; 4) arcerTi.

244. qvemoT CamoTvl il Tagan, romel ia meore rigis reaqciis siCqare integral uri formiT?

1)  $C_A = -kt + C_{0,A}$ ; 2)  $\log C_A = -kt/2,303 + \log C_{0,A}$ ; \* 3)  $1/C_A = kt + 1/C_{0,A}$ ; 4) arcerTi.

245. qvemoT CamoTvl il Tagan, romel ia pirvel i rigis reaqciis siCqaris konstantis ganzomil eba?

1)  $1/wm$ ; \* 2)  $1/\text{mol } i \times wm$ ; 3)  $1/\text{mol } i^2 \times wm$ ; 4) arcerTi.

246. qvemoT CamoTvl il Tagan, romel ia meore rigis reaqciis siCqaris konstantis ganzomil eba?

1)  $1/wm$ ; 2)  $1/\text{mol } i \times wm$ ; \* 3)  $1/\text{mol } i^2 \times wm$ ; 4) arcerTi.

247. qvemoT CamoTvl il Tagan, romel ia mesame rigis reaqciis siCqaris konstantis ganzomil eba?

1)  $1/wm$ ; 2)  $1/\text{mol } i \times wm$ ; 3)  $1/\text{mol } i^2 \times wm$ ; \* 4) arcerTi.

248. qvemoT CamoTvl il Tagan, romel ia pirvel i rigis reaqciis naxevardaSl is periodi?

1)  $t_{1/2} = C_{0,A}/2k$ ; 2)  $t_{1/2} = (k C_{0,A})^{-1}$ ; 3)  $t_{1/2} = 0,636/k$ ; \* 4) arcerTi.

249. qvemoT CamoTvl il Tagan, romel ia meore rigis reaqciis naxevardaSl is periodi?

1)  $t_{1/2} = C_{0,A}/2k$ ; 2)  $t_{1/2} = (k C_{0,A})^{-1}$ ; \* 3)  $t_{1/2} = 0,636/k$ ; 4) arcerTi.

250. qvemoT CamoTvl il Tagan, romel ia nul ovani rigis reaqciis naxevardaSl is periodi?

1)  $t_{1/2} = C_{0,A}/2k$ ; \* 2)  $t_{1/2} = (k C_{0,A})^{-1}$ ; 3)  $t_{1/2} = 0,636/k$ ; 4) arcerTi.

251. qvemoT CamoTvl il Tagan, romel ia pirvel i rigis reaqciis preeqspencial uri mamravl is ganzomil eba?

1)  $1/wm$ ; \* 2)  $1/\text{mol } i \times wm$ ; 3)  $1/\text{mol } i^2 \times wm$ ; 4) arcerTi.

252. qvemoT CamoTvl il Tagan, romel ia meore rigis reaqciis preeqspencial uri mamravl is ganzomil eba?

1)  $1/\omega m$ ;            2)  $1/\text{mol } i \times \omega m$ ; \*    3)  $1/\text{mol } i^2 \times \omega m$ ;    4) arcerTi.

253. qvemoT CamoTvl il Tagan, romel ia mesame rigis reaqciis preeqsponencial uri mamravl is ganzomil eba?

1)  $1/\omega m$ ;            2)  $1/\text{mol } i \times \omega m$ ;    3)  $1/\text{mol } i^2 \times \omega m$ ; \*    4) arcerTi.

254. Tu garkveul momentSi Seqcevadi reaqciis wil adi Seadgens 25-s da wonasworobis konstanta ki - 32-s, sait aris gadaxril i wonasworoba am momentSi?

1) produqtebisaken; \*

2) reagentebisaken;

3) mocemul i momenti Seesabameba wonasworobas;

4) pasuxisaTvis saWiroa temperaturis codna.

255. Tu garkveul momentSi Seqcevadi reaqciis wil adi Seadgens 55-s da wonasworobis konstanta ki - 52-s, sait aris gadaxril i wonasworoba am momentSi?

1) produqtebisaken;

2) reagentebisaken; \*

3) mocemul i momenti Seesabameba wonasworobas;

4) pasuxisaTvis saWiroa temperaturis codna.

256. Tu garkveul momentSi Seqcevadi reaqciis rogorc wil adi, ise wonasworobis konstanta Seadgens 52-s, sait aris gadaxril i wonasworoba am momentSi?

1) produqtebisaken;

2) reagentebisaken;

3) mocemul i momenti Seesabameba wonasworobas; \*

4) pasuxisaTvis saWiroa temperaturis codna.

257. Tu garkveul momentSi Seqcevadi reaqciis wil adi Seadgens 135-s da wonasworobis konstanta ki - 132-s, sait aris gadaxril i wonasworoba am momentSi?

1) produqtebisaken;

2) reagentebisaken; \*

3) mocemul i momenti Seesabameba wonasworobas;

4) pasuxisaTvis saWiroa temperaturis codna.

258. Tu garkveul momentSi Seqcevadi reaqciis wil adi Seadgens 250-s da wonasworobis konstanta ki - 332-s, sait aris gadaxril i wonasworoba am momentSi?

1) produqtebisaken; \*

2) reagentebisaken;

3) mocemul i momenti Seesabameba wonasworobas;

4) pasuxisaTvis saWiroa temperaturis codna.

259. Tu garkveul momentSi Seqcevadi reaqciis wil adi Seadgens 125-s, xol o wonasworoba am momentSi gadaxrilia produqtebisaken, qvemoT CamoTvl il Tagan, romel i SeiZl eba iyos wonasworobis konstantis mniSvnel oba?

1) 140; \*    2) 15;    3) 125;            4) pasuxisaTvis saWiroa temperaturis codna.

260. Termodinamika ar iZl eva Sesazl ebl obas ganisazRvros:



- 1) spontanuri (Tvi Tmimdinare) procesebis mimarTul eba.
  - 2) procesis warmarTvis zRvari;
  - 3) procesis mimdinareobis meqani zmi;\*
  - 4) procesis energetikul i bal ansi.
261. Termodinamika ar iZl eva SesaZl ebl obas ganisazRvros:
- 1) spontanuri (Tvi Tmimdinare) procesebis mimarTul eba.
  - 2) procesis mimdinareobis siCqare; \*
  - 3) procesis siTburi efeqti;
  - 4) procesis energetikul i bal ansi.
262. CamoTvl il i sidideebidan romel i ar aris mdgomareobis funqcia?
- 1) enTal pia;
  - 2) Sinagani energia;
  - 3) entropia;
  - 4) siTbo.\*
263. CamoTvl il i sidideebidan romel i ar aris mdgomareobis funqcia?
- 1) enTal pia;
  - 2) muSaoba; \*
  - 3) entropia;
  - 4) izobarul i siTbo.
264. rogori gamosaxul eba aqvs izobarul i procesebisaTvis Termodinamikis I sawyiss?
- 1)  $Q_p = \Delta H$ ;
  - 2)  $Q_p = \Delta E$ ;
  - 3)  $Q_p = W$ ;
  - 4)  $Q_p = p\Delta V$ .
265. Termodinamikis romel i sawyisis maTematikur gamosaxul ebas warmoadgens  $Q_p = \Delta H$ ?
- 1) Termodinamikis II kanonis;
  - 2) Termodinamikis I sawyiss;
  - 3) Termodinamikis I sawyiss izobarul i procesebisaTvis; \*
  - 4) Termodinamikis I sawyiss izoqorul i procesebisaTvis.
266. rogori gamosaxul eba aqvs Termodinamikis I kanons izoqorul i procesebisaTvis?
- 1)  $Q_p = \Delta H$ ;
  - 2)  $Q_v = \Delta E$ ;
  - 3)  $Q_v = \Delta E + A$ ;
  - 4)  $Q_v = \Delta E + p\Delta V$ .
267. Termodinamikis romel i sawyisis maTematikur gamosaxul ebas warmoadgens  $Q_v = \Delta E$ ?
- 1) Termodinamikis II kanonis;
  - 2) Termodinamikis I sawyiss;
  - 3) Termodinamikis I sawyiss izobarul i procesebisaTvis;
  - 4) Termodinamikis I sawyiss izoqorul i procesebisaTvis. \*
268. romel i formul iT gamoisaxeba anal izurad Termodinamikis II kanoni izol irebul i sistemisaTvis?
- 1)  $\Delta S \geq 0$ ;
  - 2)  $Q = \Delta E + A$ ;
  - 3)  $\Delta G = \Delta E - T\Delta S$ ;
  - 4)  $Q = \Delta E + p\Delta V$ .
269. romel i formul iT gamoisaxeba anal izurad Termodinamikis II kanoni Caketil i sistemisaTvis?
- 1)  $\Delta S \geq 0$ ;
  - 2)  $S = Q/T$ ;
  - 3)  $\Delta G = \Delta E - T\Delta S$ ;
  - 4)  $Q = \Delta E + p\Delta V$ .
270. egzoTermul ia procesi, roml isTvisac:
- 1)  $\Delta G > 0$ ;
  - 2)  $\Delta H = 0$ ;
  - 3)  $\Delta H > 0$ ;
  - 4)  $\Delta H < 0$ .\*
271. egzergonul ia procesi, roml isTvisac:
- 1)  $\Delta G < 0$ ;
  - 2)  $\Delta H = 0$ ;
  - 3)  $\Delta H > 0$ ;
  - 4)  $\Delta H < 0$ .
272. endergonul ia procesi, roml isTvisac:
- 1)  $\Delta G > 0$ ;
  - 2)  $\Delta H = 0$ ;
  - 3)  $\Delta H > 0$ ;
  - 4)  $\Delta H < 0$ .
273. rogor aris dakavSirebul i sistemis entropia Termodinamikur al baTobasTan?

- 1)  $S=K/\ln W$     2)  $S=K\ln W$ ;    3)  $S=\ln W$ ;    4)  $K=S \ln W$ .
274. rogor aris dakavSirebul i Termodinamikuri al baToba sistemis entropiasTan?
- 1)  $S=K/\ln W$     2)  $S=K\exp(W)$ ;    3)  $S=\ln W$ ;    4)  $W=\exp(S/K)$ . \*
275. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $SO_3(a)$ ; \*    2)  $SO_2(a)$ ;    3)  $P_4(my)$ ;    4)  $H_2(a)$ .
276. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $SO_3(Tx)$ ;    2)  $SO_2(a)$ ; \*    3)  $P_4(my)$ ;    4)  $H_2(a)$ .
277. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $O_3(a)$ ;    2)  $NH_3(a)$ ; \*    3)  $O(a)$ ,    4)  $I_2(my)$ .
278. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze nakl ebi entropia?
- 1)  $O_3(a)$ ;    2)  $NH_3(a)$ ;    3)  $O(a)$ ,    4)  $I_2(my)$ . \*
279. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $N_2O_3(a)$ ; \*    2)  $NH_3(a)$ ;    3)  $O(a)$ ,    4)  $I_2(my)$ .
280. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $S_8(my)$ ; 2)  $SO_2(a)$ ;    3)  $Br_2(Tx)$ ;    4)  $CH_4(a)$ .\*
281. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze meti entropia?
- 1)  $S_8(my)$ ; 2)  $N_2O_4(a)$ ; \* 3)  $Br_2(Tx)$ ;    4)  $CH_4(a)$ .
282. Tanabari raodenobiT aRebul i qvemoT CamoTvli il i nivTierebebi dan romel saqvs yvel aze nakl ebi entropia?
- 1)  $S_8(my)$ ; \*    2)  $SO_2(a)$ ;    3)  $Br_2(Tx)$ ;    4)  $CH_4(a)$ .
283. mocemul i pirobebidan romel ia aucil ebel i imisaTvis, rom Seqcevadi reaqcia pirdapiri mimarTul ebiT warimarTos?
- 1)  $\Delta S > 0$ ; 2)  $\Delta H < 0$ ;    3)  $\Delta G < 0$ ; \*    4)  $\Delta H > 0$ .
284. mocemul i pirobebidan romel ia aucil ebel i imisaTvis, rom Seqcevadi reaqcia Sebrunebul i mimarTul ebiT warimarTos?
- 1)  $\Delta S > 0$ ; 2)  $\Delta H < 0$ ;    3)  $\Delta G < 0$ ;    4)  $\Delta G > 0$ . \*
285. procesis TviTneburimimdinareobis Sesazl ebl oba arsebobs, roca:
- 1)  $\Delta H > 0$ ; 2)  $G = 0$ ;    3)  $\Delta S > 0$ ; \*    4)  $\Delta G > 0$ ;
286. qvemoT mocemul i pirobebidan, roml is dros aris reaqcia Seuqcevadi:
- 1)  $\Delta G > 0$ ,  $\Delta H > 0$ ; 2)  $\Delta H > 0$ ,  $\Delta S > 0$ ;    3)  $\Delta H < 0$ ,  $\Delta S < 0$ ;    4)  $\Delta H < 0$ ,  $\Delta S > 0$ .\*
287. romel i piroba ar iTvl eba sistemaTa standartul mdgomareobad qimiaSi?
- 1)  $T = 298K$ ;    2)  $P = 101,3kpa$ ;    3)  $pH = 7$ ; \* 4) nivTierebis raodenoba 1 mol i.
288. romel i piroba iTvl eba sistemaTa standartul mdgomareobad qimiaSi?
- (a)  $T = 298K$ ;    (b)  $P = 101,3kpa$ ;    (g)  $V = 1l$ ;    (d)  $\rho = 1kg/m^3$ .
- 1) a da b; \*    2) mxol od a;    3) mxol od b;    4) a da g.
289. romel i piroba iTvl eba sistemaTa standartul mdgomareobad qimiaSi?
- (a)  $T = 298K$ ;    (b)  $V = 1l$ ; (g)  $\rho = 1kg/m^3$ .

- 1) a da b; 2) mxol od a; \* 3) mxol od b; 4) a da g.
290. romel i pirobebi ar Seesabameba Termodinamikur wonasworobas?
- 1) sistemis Tvissebebi ucvl el ia droSi garemosTan nivTierabis, energiisa da informaciis gacvl is xarj ze;\*
  - 2) sistemaSi ar arsebobs nivTierabis nakadi;
  - 3) sistemaSi ar arsebobs energiis nakadi;
  - 4) entropia maqsimal uria.
291. romel i pirobebi Seesabameba Termodinamikur wonasworobas?
- 1) sistemis Tvissebebi ucvl el ia droSi garemosTan nivTierabis, energiisa da informaciis gacvl is xarj ze;
  - 2) sistemaSi arsebobs nivTierabis nakadi;
  - 3) sistemaSi arsebobs energiis nakadi;
  - 4) Tavisufal i energia minimal uria. \*
292. eqstensiuri Termodinamikuri parametri ar aris:
- 1) mocul oba; 2) mol uri enTal pia; \* 3) energia; 4) entropia.
293. eqstensiuri Termodinamikuri parametri ar aris:
- 1) wneva; \* 2) enTal pia; 3) energia; 4) entropia.
294. intensiuri Termodinamikuri parametria:
- 1) mocul oba; 2) masa; 3) energia; 4) koncentracia. \*
295. intensiuri Termodinamikuri parametri ar aris:
- 1) mocul oba; \* 2) simkvrive; 3) wneva; 4) koncentracia.
296. qvemoTCamoTvl il Tagan romel i araa mdgomareobis funqcia?
- 1) Sinagani energia; 2) siTbo; \* 3) enTal pia; 4) entropia.
297. qvemoTCamoTvl il Tagan romel ia gadasvl is funqcia?
- 1) Sinagani energia; 2) siTbo; \* 3) enTal pia; 4) entropia.
298. qvemoTCamoTvl il Tagan romel i araa mdgomareobis funqcia?
- 1) Sinagani energia; 2) gibsis Tavisufal i energia; 3) enTal pia; 4) muSaoba.\*
299. qvemoTCamoTvl il Tagan romel ia gadasvl is funqcia?
- 1) Sinagani energia; 2) gibsis Tavisufal i energia; 3) enTal pia; 4) muSaoba.\*
300. qvemoTCamoTvl il Tagan romel ia Termodinamikis II kanonis formul ireba?
- 1) sistemis Sinagani energia ar icvl eba;
  - 2) sistemasa da garemos Soris energiis mimocvl a mimdinareobs TbogadacemiTa da Sesrul ebul i muSaobiT;
  - 3) siTbo TavisTavad gadaecema Tbil i sxeul idan civs;\*
  - 4) absol utur nul ze entropia mudmivia.
300. qvemoTCamoTvl il Tagan romel ia Termodinamikis III kanonis formul ireba?
- 1) sistemis Sinagani energia ar icvl eba;
  - 2) sistemasa da garemos Soris energiis mimocvl a mimdinareobs TbogadacemiTa da Sesrul ebul i muSaobiT;
  - 3) siTbo TavisTavad gadaecema Tbil i sxeul idan civs;
  - 4) absol utur nul ze entropia mudmivia.\*
301. ra ewodeba Termodinamikur funqcias, romel ic gamoiTvl eba formul iT  $E+pV$ , sadac E Sinagani energiaa, p – wneva, V – mocul oba?
- 1) entropia; 2) gibsis Tavisufal i energia; 3) enTal pia; \* 4) muSaoba.

302. ra ewodeba Termodinamikur funqcias, romel ic gamoiTvl eba formul iT  $E+pV-TS$ , sadac E Sinagani energiaa, p – wneva, V – mocul oba, T-temperatura, S-entropia?

1) entropia; 2) gibsis Tavisufal i energia; \* 3) enTal pia; 4) muSaoba.

303. ra ewodeba Termodinamikur funqcias, romel ic gamoiTvl eba formul iT  $H-pV$ , sadac H enTal piaa, p – wneva, V – mocul oba?

1) Sinagani energia; \* 2) gibsis Tavisufal i energia; 3) enTal pia; 4) muSaoba.

304. Termodinamika ar iZl eva SesaZl ebl obas ganisazRvros:

1) spontanuri (TviTmimdinare) procesebis mimarTul eba.

2) procesis warmarTvis zRvari;

3) procesis mimdinareobis meqani zmi.

4) procesis ganmavl obaSi STanTqmul i an gamosxivebul i qvantebis sixSire.\*

305. CamoTvl il i sidi debidan romel i warmoadgens Termodinamikul parametrs?

1) enTal pia; 2) wneva;\* 3) entropia; 4) siTbo.

306. warmoqmni enTal pia ewodeba:

1) martivi nivTierebebidan 1 mol i nivTierebis warmoqmni reaqciis enTal pi as;

2) reaqciis enTal pi as, romel ic 1 mol i reaqciis produqtebis warmoqmni enTal pi ebis j amis tol ia;

3) rTul i nivTierebebidan 1 mol i martivi nivTierebebis warmoqmni reaqciis enTal pi as;

4) nebsmieri reaqci iT nivTierebebis warmoqmni enTal pi as.

307. CamoTvl il i airebidan roml is warmoqmni standartul i enTal piaa nul is tol i?

1) Jangbadis;\* 2) naxSirbadis di oqsidis; 3) amiakis; 4) naxSirbadis monoqsidis.

308. romel SemTxvevaSi warimarTeba reaqcia nebsmier temperaturaze?

1)  $\Delta H^0 < 0, \Delta S^0 > 0$ ;\* 2)  $\Delta H^0 < 0, \Delta S^0 < 0$ ; 3)  $\Delta H^0 > 0, \Delta S^0 > 0$ ; 4)  $\Delta H^0 > 0, \Delta S^0 < 0$ .

309. procesis TviTnebur i warmarTvis SesaZl ebl oba ar arsebobs, roca:

1)  $\Delta H^0 < 0, \Delta S^0 > 0$ ; 2)  $\Delta H^0 < 0, \Delta S^0 < 0$ ; 3)  $\Delta H^0 > 0, \Delta S^0 > 0$ ; 4)  $\Delta H^0 > 0, \Delta S^0 < 0$ .\*

310. qvemoT mocemul i romel i reaqciisTvisaa  $\Delta S > 0$ ?

1)  $SO_{3(TX)} + H_2O_{(TX)} = H_2SO_{4(TX)}$ ; 2)  $2Hg_{(T)} + O_{2(a)} = 2HgO_{(my)}$ ;

3)  $2HgO_{(my)} = 2Hg_{(T)} + O_{2(a)}$ ;\* 4)  $S_{(my)} + O_{2(a)} \rightarrow SO_{2(a)}$ .

311. mocemul qim i ur reaqciaSi:  $\frac{1}{2}C_{(my)} + \frac{1}{2}CO_{2(a)} = CO_{(a)}$  rogor icvl eba entropia?

1) ar icvl eba; 2) dasawisSi mcirdeba, Semdeg ucvl el i rCeba;

3) mcirdeba; 4) izrdeba.\*

312. mocemul qim i ur reaqciaSi:  $C_{(my)} + O_{2(a)} = CO_{2(a)}$  rogor icvl eba entropia?

1) izrdeba; 2) mcirdeba; 3) ar icvl eba;\*

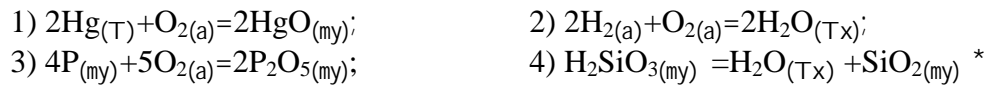
4) DasawisSi izrdeba, Semdeg mcirdeba;

313. qvemoT CamoTvl il i procesebidan romel SemTxvevaSi aqvs adgil i entropiis maqsimal ur dadebiT cvl il ebas?

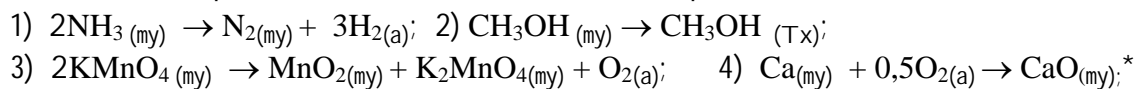
1)  $CH_3OH_{(my)} \rightarrow CH_3OH_{(a)}$ ; 2)  $CH_3OH_{(my)} \rightarrow CH_3OH_{(TX)}$ ;

3)  $3H_2(a) + N_2(a) \rightarrow 2NH_3(a)$ ; 4)  $2NH_3(a) \rightarrow 3H_2(a) + N_2(a)$ ;

314. qvemoT mocemul i romel i reaqciisTvisaa  $\Delta S > 0$ ?



315. romel i procesi mimdinareobs entropiis Semcirebi T?



316. rogor icvl eba entropia reaciaSi:  $\text{B}_2\text{O}_3 + \text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{B}$ ?

1) umniSvnel od icvl eba;\* 2) mkveTrad mcirdeba; 3) mkveTrad izrdeba;  
 4) pasuxisaTvis aucil ebel ia gibsis energiis cvl il ebis codna.

317. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = +193\text{kJ/mol}$  da  $S_m^0 = +200\text{kJ/K mol}$  ?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris; \*
- 4) TavisTavad mimdinareobs nebismier temperaturaze.

318. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = -163\text{kJ/mol}$  i da  $S_m^0 = +20\text{kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 4) TavisTavad mimdinareobs nebismier temperaturaze. \*

319. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = -123\text{kJ/mol}$  i da  $S_m^0 = -120\text{kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar; \*
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 4) TavisTavad mimdinareobs nebismier temperaturaze;

320. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = +165\text{kJ/mol}$  i da  $S_m^0 = -147\text{kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze; \*
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 4) TavisTavad mimdinareobs nebismier temperaturaze.

321. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = +22\text{kJ/mol}$  da  $S_m^0 = +2000\text{kJ/K mol}$  ?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris; \*
- 4) TavisTavad mimdinareobs nebismier temperaturaze.

322. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = -13\text{kJ/mol}$  i da  $S_m^0 = +300\text{kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 4) TavisTavad mimdinareobs nebismier temperaturaze. \*

323. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = -183 \text{ kJ/mol}$  i da  $S_m^0 = -10 \text{ kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar; \*
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze;
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 4) TavisTavad mimdinareobs nebismier temperaturaze.

324. mimdinareobs Tu ara procesi TavisTavad, Tu  $H_m^0 = +115 \text{ kJ/mol}$  i da  $S_m^0 = -12 \text{ kJ/K mol}$  i?

- 1) garkveul temperaturamde aris, Semdeg – aRar;
- 2) ar mimdinareobs TavisTavad nebismier temperaturaze; \*
- 3) garkveul temperaturamde ar aris, Semdeg ki aris;
- 3) TavisTavad mimdinareobs nebismier temperaturaze.

325. Termodinamikis II kanonis mixedviT, Sinagani energiis ra nawil ia xel misawvdomi muSaobis Sesasrul ebl ad?

- 1) xel misawvdomi a mTI ianad;
- 2) Sinagani energia ar SeiZI eba moxmardes muSaobis Sesrul ebas;
- 3) bmul i energia;
- 4) Tavisufal i energia. \*

326. Termodinamikis II kanonis mixedviT, Sinagani energiis ra nawil ia xel miuwvdomel i muSaobis Sesasrul ebl ad?

- 1) xel misawvdomi a mTI ianad;
- 2) Sinagani energia ar SeiZI eba moxmardes muSaobis Sesrul ebas;
- 3) bmul i energia; \*
- 4) Tavisufal i energia.

327. rogor aris dakavSirebul i Tavisufal i energiis cvl il eba procesis TavisTavad mimdinareobasTan?

- 1) procesi TavisTavad mimdinareobs, Tu Tavisufal i energia ar icvl eba;
- 2) procesi TavisTavad mimdinareobs, Tu Tavisufal i energia mcirdeba; \*
- 3) procesi TavisTavad mimdinareobs, Tu Tavisufal i energia izrdeba;
- 4) Tavisufal i energiis cvl il eba procesis TavisTavad mimdinareobasTan dakavSirebul ia mxol od entropiis mudmivobis sas.

328. Sinagani energia ar moicavs:

- 1) sistemis sivrceSi mdebareobis potenciur energias;\*
- 2) Sigamol ekul ur, Sigatomur da birTvul energias;
- 3) sistemis yvel a nawil akis gadataniTi, brunviTi da rxeviTi moZraobis energias.
- 4) nivTierebis Semadgenel i atomebis, mol ekul ebis, ionebis da el ementarul i nawil akebis yvel a saxis urTierTqmedebaTa energiebis j ams.

329. romel i formul irebaa swori?

- 1) reaquiis siTburi efeqti araa damokidebul i procesis gzaze (Sual edur stadienze) da ganisazRvreba sistemis sawyisi da sabol oo mdgomareobiT;
- 2) reaquiis siTburi efeqti aRebul nivTierebaTa warmoqmnis enTal piebis j amsa da reaquiis produqtebis warmoqmnis enTal piebis j ams Soris sxvaobis tol ia;

- 3) reaqqiis siTburi efeqti miRebul nivTierebaTa wwis enTal piebis j amsa da aRebul i nivTierebebis wwis enTal piebis j ams Soris sxvaobis tol ia;
- 4) izol irebul sistemaSi Sinagani energia ar icvl eba.\*
330. izobarul da izoqorul siTbur efeqtebs Soris sxvaoba tol ia:
- 1) sistemis mier Sestrul ebul i muSaobis;\* 2) nul is;
- 3) sistemis entropiis cvl il ebis; 4) gibsis energiis cvl il ebis.
331. entropiis cvl il ebis mixedviT SesaZI ebel ia procesis mimarTul ebis gansazRvra, Tu sistema aris :
- 1) Ria; 2) Caketil i; 3) izol irebul i;\* 4) nebismieri.
332. Caketil sistemaSi procesis mimarTul ebisa da wonasworobis kriteriumia:
- 1) Sinagani energia; 2) enTal pia; 3) gibsis energia;\* 4) entropia.
333. CamoTvl il i mosazrebebidan romel ia araswori?
- 1) gibsis Tavisufal i energia damokidebul ia procesSi monawil e nivTierebebis bunebaze;
- 2) Caketil sistemaSi procesis mimarTul ebisa da wonasworobis kriteriumia entropia;\*
- 3) gibsis Tavisufal i energiis cvl il eba tol ia maqsimal uri muSaobis, romel ic sistemas SeuZI ia Seasrul os izoTermul -izobarul procesSi;
- 4) gibsis Tavisufal i energia damokidebul ia procesSi monawil e nivTierebebis raodenobebze.
334. entropiis mniSvnel oba damokidebul i ar aris:
- 1) nivTierebis bunebaze; 2) mocul obaze;\*
- 3) sistemis sirTul eze; 4) temperaturaze;
335. romel i mosazrebaa mcdari?
- 1) sistemis mdgomareoba stacional uria, Tu misi Tvisebebi ucvl el ia droSi da mudmivobis SenarCuneba xdeba sistemasa da garemos Soris nivTierebis, energiisa da informaciis gacvl is xarj ze;
- 2) nebismier sistemaSi Sinagani energia mudmivia;\*
- 3) enTal pia mdgomareobis funqciaa, roml is cvl il eba izobarul procesSi sistemis mier miRebul i siTbos tol ia;
- 4) izobarul -izoTermul pirobebSi maqsimal uri muSaoba gibsis energiis danakargze ( $-\Delta G$ ) nakl ebia, Tu procesi Seuqcevadia.
336. romel i mosazrebaa mcdari?
- 1) Sinagani energia mdgomareobis funqciaa, roml is cvl il eba izobarul procesSi sistemis mier miRebul i siTbos tol ia;\*
- 2) Termodinamikuri wonasworobisas sistemis entropia mudmivi da maqsimal uria;
- 3) TavisTavad mimdinare reaqqiebisatvis Tavisufal i energiis cvl il eba uaryofiTia;
- 4) sistemebs Soris urTierTqmedebisas eqstensiuri parametrebis mniSvnel obebi ikribeba, xol o intensiuri – gasaSual deba.
337. romel i mosazrebaa mcdari?
- 1) sistema Caketil ia, Tu igi garemosTan axorciel ebs mxol od energiis gacvl as;
- 2) sistemas, roml is yvel a nawil is qimiuri Sedgenil oba da fizikuri

Tvisebebi erTnairia da maT Soris arsebobs gamyofi zedapiri, homogenuri ewodeba;\*

3) sistemis enTal piis absol uturi mniSvnel obis gansazRvra SeuZI ebel ia;

4) enTal pia damokidebul ia nivTierebis raodenobaze, temperaturasa da wnevaze.

338. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba gogirdmJavas warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $2H(a)+S(my)+4O(a) \rightarrow H_2SO_4(Tx)$ ;      2)  $H_2(a)+S(my)+2O_2(a) \rightarrow H_2SO_4(Tx)$ ; \*

3)  $H_2(a)+S(a)+2O_2(a) \rightarrow H_2SO_4(Tx)$ ;      4)  $H_2SO_4(a) \rightarrow H_2(a)+S(my)+2O_2(a)$ .

339. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba azotmJavas warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $H(a)+N(a)+3O(a) \rightarrow HNO_3(Tx)$ ;      3)  $H_2(a)+N_2(a)+3O_2(a) \rightarrow 2HNO_3(Tx)$ ;

3)  $1/2H_2(a)+1/2N_2(a)+3/2O_2(a) \rightarrow HNO_3(Tx)$ ; \*      4)  $HNO_3(a) \rightarrow 1/2H_2(a)+1/2N_2(a)+3/2O_2(a)$ .

340. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba gogirdovanmJavas warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $2H(a)+S(my)+3O(a) \rightarrow H_2SO_3(Tx)$ ;      3)  $2H_2(a)+2S(my)+3O_2(a) \rightarrow 2H_2SO_3(Tx)$ ;

3)  $H_2(a)+S(my)+3/2O_2(a) \rightarrow H_2SO_3(Tx)$ ; \*      4)  $H_2SO_4(a) \rightarrow H_2(a)+S(my)+2O_2(a)$ .

341. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba azotovanmJavas warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $1/2H_2(a)+1/2N_2(a)+O_2(a) \rightarrow HNO_2(Tx)$ ; \*      2)  $H_2(a)+N_2(a)+3O_2(a) \rightarrow 2HNO_3(Tx)$ ;

3)  $H_2(a)+N_2(a)+2O_2(a) \rightarrow 2HNO_2(Tx)$ ;      4)  $HNO_2(a) \rightarrow 1/2H_2(a)+1/2N_2(a)+2O_2(a)$ .

342. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba natriumis karbonatis warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $2Na(my)+C(my)+3O(a) \rightarrow Na_2CO_3(my)$ ;      2)  $2Na(my)+C(my)+3/2O_2(a) \rightarrow Na_2CO_3(Tx)$ ; \*

3)  $Na_2(my)+C(my)+3/2O_2(a) \rightarrow Na_2CO_3(my)$ ;      4)  $Na_2CO_3(my) \rightarrow 2Na(my)+C(my)+2O_2(a)$ .

343. qvemoT CamoTvl il Tagan, romel i reaqciis mixedviT xorciel deba magniumis sul fatis warmoqmnis enTal piis gamoTvl a? (frCxil ebSi miTiTebul ia fazuri mdgomareoba.)

1)  $Mg(a)+S(my)+4O(a) \rightarrow MgSO_4(my)$ ;      2)  $Mg(my)+S(my)+2O_2(a) \rightarrow MgSO_4(my)$ ; \*

3)  $Mg(my)+S(a)+2O_2(a) \rightarrow MgSO_4(Tx)$ ;      4)  $MgSO_4(a) \rightarrow Mg(my)+S(my)+2O_2(a)$ .

344. ganvixil oT Semdegi reaqcia:  $H_2(a)+Cl_2(a) \rightarrow 2HCl(a)$ ;  $H=-92kj$ . cnobil ia, rom reaqcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori?

1) reaqcia endoTermul ia, ase, rom sareaqcio aris temperatura gaiZRdeba;

2) reaqcia egzoTermul ia, ase, rom sareaqcio aris temperatura gaiZRdeba; \*

3) reaqcia endoTermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;

4) reaqcia egzoTermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;



345. ganvixil oT hipoteturi reakcia:  $A_2(a)+B_2(a) \rightarrow 2AB(a)$ ;  $H=+24\text{kJ}$ . cnobil ia, rom reakcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori?

- 1) reakcia endotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 2) reakcia egzotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 3) reakcia endotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;\*
- 4) reakcia egzotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;

346. ganvixil oT hipoteturi reakcia:  $2AB(a)+2D_2(a) \rightarrow 2AD_2(a)+B_2(a)$ ;  $H=-123\text{kJ}$ . cnobil ia, rom reakcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori?

- 1) reakcia endotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 2) reakcia egzotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba; \*
- 3) reakcia endotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;
- 4) reakcia egzotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba.

347. ganvixil oT hipoteturi reakcia:  $A_2(a)+D(my) \rightarrow A_2D(a)$ ;  $H=0\text{kJ}$ . cnobil ia, rom reakcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori?

- 1) reakcia endotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 2) reakcia egzotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 3) reakcia endotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;
- 4) sareaqcio aris temperatura ar Seicvl e ba; \*

348. ganvixil oT hipoteturi reakcia:  $H_2(a)+Cl_2(a) \rightarrow 2HCl(a)$ ;  $H=-92\text{kJ}$ . cnobil ia, rom reakcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori Sebrunebul i reakciisaTvis?

- 1) Sebrunebul i reakcia endotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 2) Sebrunebul i reakcia egzotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 3) Sebrunebul i reakcia endotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba; \*
- 4) Sebrunebul i reakcia egzotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;

349. ganvixil oT hipoteturi reakcia:  $A_2(a)+B_2(a) \rightarrow 2AB(a)$ ;  $H=122\text{kJ}$ . cnobil ia, rom reakcia tardeba Termoizol aciis pirobebSi. qvemoT moyvanil Tagan, romel i mosazrebaa swori Sebrunebul i reakciisaTvis?

- 1) Sebrunebul i reakcia endotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba;
- 2) Sebrunebul i reakcia egzotermul ia, ase, rom sareaqcio aris temperatura gai z r de ba; \*
- 3) Sebrunebul i reakcia endotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba;
- 4) Sebrunebul i reakcia egzotermul ia, ase, rom sareaqcio aris temperatura Semcirdeba.

350. ganvixil oT reaqciebi: (a)  $P_4+10Cl_2 \rightarrow 4PCl_5+Q_1$ , (b)  $P_4+6Cl_2 \rightarrow 4PCl_3+Q_2$ , (g)  $PCl_3+Cl_2 \rightarrow PCl_5+Q_3$ . qvemoT CamoTvl il Tagan, romel i gamosaxavs j amuri procesis enTal piis cvl il ebas?

1)  $-(Q_1+Q_2)$ ; 2)  $-(Q_2+4Q_3)$ ; \* 3)  $-(Q_1+4Q_3)$ ; 4)  $-(Q_1+Q_3)$ .

351. ganvixil oT reaqciebi: (a)  $C+1/2O_2 \rightarrow CO+Q_1$ , (b)  $CO+1/2O_2 \rightarrow CO_2+Q_2$  (g)  $C+O_2 \rightarrow CO_2+Q_3$ . qvemoT CamoTvl il Tagan, romel i gamosaxavs j amuri procesis enTal piis cvl il ebas?

1)  $-(Q_1+Q_2)$ ; \* 2)  $-(Q_2+Q_3)$ ; 3)  $-(Q_1+Q_3)$ ; 4)  $Q_1-Q_3$ .

352. ganvixil oT hipoTeturi reaqcia:  $A_2B_3(my)+3DB(a) \rightarrow 3DB_2(a)+2A(my)$ . cnobil ia, rom  $H_f^0(A_2B_3, my)=-825\text{ kJ/mol}$ ;  $H_f^0(DB, Tx)=-150,5\text{ kJ/mol}$ ;  $H_f^0(DB_2, a)=-393,5\text{ kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad? Amartivi nivTierebaa.

1)  $H_f^0(A)$ ;

2) A-s aorTql ebis siTbo normal ur pirobebSi;

3) monacemebi sakmarisia.

4) DB-s kondensaciis siTbo normal ur pirobebSi. \*

353. ganvixil oT hipoTeturi reaqcia:  $A_2B_3(my)+3DB(a) \rightarrow 3DB_2(a)+2A(my)$ . cnobil ia, rom  $H_f^0(A_2B_3, my)=-825\text{ kJ/mol}$ ;  $H_f^0(DB, a)=-150,5\text{ kJ/mol}$ ;  $H_f^0(DB_2, a)=-393,5\text{ kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad? Amartivi nivTierebaa.

1)  $H_f^0(A)$ ;

2) DB-s kondensaciis siTbo normal ur pirobebSi.

3)  $H_f^0(B_2)$ ;

4) monacemebi sakmarisia. \*

354. ganvixil oT hipoTeturi reaqcia:  $A_2B_3(my)+3DB(a) \rightarrow 3DB_2(Tx)+2A(my)$ . cnobil ia, rom  $H_f^0(A_2B_3, my)=-825\text{ kJ/mol}$ ;  $H_f^0(DB, a)=-150,5\text{ kJ/mol}$ ;  $H_f^0(DB_2, a)=-393,5\text{ kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad? Amartivi nivTierebaa.

1)  $H_f^0(A)$ ;

2) DB-s kondensaciis siTbo normal ur pirobebSi.

3)  $DB_2$ -s kondensaciis siTbo normal ur pirobebSi. \*

4) monacemebi sakmarisia.

355. ganvixil oT hipoTeturi reaqcia:  $A_2B_3(my)+3DB(a) \rightarrow 3DB_2(Tx)+2A(my)$ . cnobil ia, rom  $H_f^0(A_2B_3, my)=-825\text{ kJ/mol}$ ;  $H_f^0(DB, a)=-150,5\text{ kJ/mol}$ ;  $H_f^0(DB_2, Tx)=-393,5\text{ kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad? ArTul i nivTierebaa.

1)  $H_f^0(A)$ ; \*

2) DB-s kondensaciis siTbo normal ur pirobebSi.

3)  $DB_2$ -s kondensaciis siTbo normal ur pirobebSi.

4) monacemebi sakmarisia.

356. ganvixil oT reaqcia:  $Fe_2O_3(my)+3CO(a) \rightarrow 3CO_2(a)+2Fe(my)$ . cnobil ia, rom  $H_f^0(Fe_2O_3, my)=-825\text{ kJ/mol}$ ;  $H_f^0(CO, Tx)=-150,5\text{ kJ/mol}$ ;  $H_f^0(CO_2, a)=-393,5\text{ kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad?

- 1)  $H_f^0(\text{Fe})$ ;
- 2) rkinis aorTql ebis siTbo normal ur pirobebSi;
- 3)  $H_f^0(\text{O}_2)$ ;
- 4) naxSirbadis monoqsidis kondensaciis siTbo normal ur pirobebSi. \*
357. ganvixil oT reaqcia:  $\text{Fe}_2\text{O}_3(\text{my})+3\text{CO}(\text{a}) \rightarrow 3\text{CO}_2(\text{a})+2\text{Fe}(\text{my})$ . cnobil ia, rom  $H_f^0(\text{Fe}_2\text{O}_3, \text{my})=-825\text{kJ/mol}$ ;  $H_f^0(\text{CO}, \text{a})=-150,5\text{kJ/mol}$ ;  $H_f^0(\text{CO}_2, \text{a})=-393,5\text{kJ/mol}$ . qvemoT CamoTvl il Tagan, kidev romel i monacemia saWiro reaqciis siTburi efeqtis gamosaTvl el ad?
- 1)  $H_f^0(\text{Fe})$ ;
- 2) monacemebi sakmarisia; \*
- 3)  $H_f^0(\text{O}_2)$ ;
- 4) naxSirbadis monoqsidis kondensaciis siTbo normal ur pirobebSi. \*
358. Caketil i sistemis mier garemoze Sesrul ebul i muSaobis ricxviTi mniSvnel obis modul ia  $|w|=25\text{j}$ . sistemis mier garemodan miRebul i siTbo Seadgens  $|q|=54\text{j}$  oul s. qvemoTCamoTvl il Tagan, romel i Seesabameba sistemis Sinagani energiis cvl il ebas?
- 1) 79j ; 2) 29j ; \* 3) -29j ; 4) -79j .
359. Caketil sistemaze garemos mier Sesrul ebul i muSaobis ricxviTi mniSvnel obis modul ia  $|w|=25\text{j}$ . sistemis mier garemodan miRebul i siTbo Seadgens  $|q|=54\text{j}$  oul s. qvemoTCamoTvl il Tagan, romel i Seesabameba sistemis Sinagani energiis cvl il ebas?
- 1) 79j ; \* 2) 29j ; 3) -29j ; 4) -79j .
360. Caketil i sistemis mier garemoze Sesrul ebul i muSaobis ricxviTi mniSvnel obis modul ia  $|w|=25\text{j}$ . sistemis mier garemosaTvis gacemul i siTbo Seadgens  $|q|=54\text{j}$  oul s. qvemoTCamoTvl il Tagan, romel i Seesabameba sistemis Sinagani energiis cvl il ebas?
- 1) 79j ; 2) 29j ; 3) -29j ; 4) -79j . \*
361. Caketil i sistemis mier garemoze Sesrul ebul i muSaobis ricxviTi mniSvnel obis modul ia  $|w|=45\text{j}$ . ras udris sistemis mier garemodan miRebul i siTbo, Tu cnobil ia, rom Sinagani energiis cvl il eba Seadgens +80 j oul s?
- 1) 35j ; 2) 125j ; \* 3) -125j ; 4) -35j .
362. Caketil sistemaze garemos mier Sesrul ebul i muSaobis ricxviTi mniSvnel obis modul ia  $|w|=32\text{j}$ . ras udris sistemis mier garemosaTvis gacemul i siTbo, Tu cnobil ia, rom Sinagani energiis cvl il eba Seadgens +10 j oul s?
- 1) 22j ; 2) 42j ; 3) -22j ; \* 4) -42j .
363. ganvixil oT romel ime el ementis daJangvis reaqcia:  $2\text{A}(\text{my})+\text{O}_2(\text{a}) \rightarrow 2\text{AO}(\text{my})$ ;  $H=-700\text{kJ}$ . qvemoT CamoTvl il Tagan, romel ia Semdegi reaqciis siTburi efeqti:  $\text{AIO}(\text{my}) \rightarrow \text{A}(\text{my}) +1/2\text{O}_2(\text{a})$ ?
- 1) -700kj ; 2) +700kj ; 3) +350kj ; \* 4) +1400kj .
364. ganvixil oT romel ime el ementis daJangvis reaqcia:  $4\text{A}(\text{my})+3\text{O}_2(\text{a}) \rightarrow 2\text{A}_2\text{O}_3(\text{my})$ ;  $H=-500\text{kJ}$ . qvemoT CamoTvl il Tagan, romel ia Semdegi reaqciis siTburi efeqti:  $\text{A}_2\text{O}_3(\text{my}) \rightarrow 2\text{A}(\text{my}) +3/2\text{O}_2(\text{a})$ ?
- 1) -250kj ; 2) +250kj ; \* 3) +400kj ; 4) +800kj . \*

365. ganvixil oT hipoteturi reaqcia:  $2A(my) + 5/2B_2(a) \rightarrow A_2B_5(my)$ ;  $H = -800kj$ . qvemoT CamoTvl il Tagan, romel ia Semdegi reaqciis siTburi efeqti:  $A_2O_3(my) \rightarrow 2Al(my) + 5/2B_2(a)$ ?

1)  $-200kj$ ; 2)  $+200kj$ ; 3)  $+400kj$ ; 4)  $+800kj$ . \*

366. ganvixil oT reaqcia:  $2C_2H_6(a) + 7O_2(a) \rightarrow 4CO_2(a) + 6H_2O(a)$ ;  $H = -3100kj$ . qvemoT CamoTvl il Tagan, romel ia Semdegi reaqciis siTburi efeqti:  $2CO_2(a) + 3H_2O(a) \rightarrow C_2H_6(a) + 7/2O_2(a)$ ?

1)  $+1550kj$ ; \* 2)  $-1550kj$ ; 3)  $+3100kj$ ; 4)  $+6200kj$ .

367. ganvixil oT reaqcia:  $2H_2(a) + O_2(a) \rightarrow 2H_2O(a)$ ;  $H = -572kj$ . qvemoT CamoTvl il Tagan, romel ia Semdegi reaqciis siTburi efeqti:  $H_2O(a) \rightarrow H_2(a) + 1/2O_2(a)$ ?

1)  $-286kj$ ; 2)  $+286kj$ ; \* 3)  $+572kj$ ; 4)  $+1144kj$ .

368. ganvixil oT reaqciebi: (a)  $P_4 + 10Cl_2 \rightarrow 4PCl_5$ , (b)  $P_4 + 6Cl_2 \rightarrow 4PCl_3$ , (g)  $PCl_3 + Cl_2 \rightarrow PCl_5$ . romel i maTgani unda ganixil ebodes j amur procesad saimisod, rom SesaZl ebel i gaxdes hesis kanonis gamoyeneba?

1) a; \* 2) b; 3) g; 4) arcerTi.

369. ganvixil oT reaqciebi: (a)  $C + 1/2O_2 \rightarrow CO$ , (b)  $CO + 1/2O_2 \rightarrow CO_2$ , (g)  $C + O_2 \rightarrow CO_2$ . romel i maTgani unda ganixil ebodes j amur procesad saimisod, rom SesaZl ebel i gaxdes hesis kanonis gamoyeneba?

1) a; 2) b; 3) g; \* 4) arcerTi.

370. ganvixil oT reaqciebi: (a)  $N_2 + 2O_2 \rightarrow 2NO_2$ , (b)  $N_2 + O_2 \rightarrow 2NO$ , (g)  $NO + 1/2O_2 \rightarrow NO_2$ . romel i maTgani unda ganixil ebodes j amur procesad saimisod, rom SesaZl ebel i gaxdes hesis kanonis gamoyeneba?

1) a; \* 2) b; 3) g; 4) arcerTi.

371. ganvixil oT reaqciebi: (a)  $SO_2 + 1/2O_2 \rightarrow SO_3$ , (b)  $S + 3/2O_2 \rightarrow SO_3$ , (g)  $S + O_2 \rightarrow SO_2$ . romel i maTgani unda ganixil ebodes j amur procesad saimisod, rom SesaZl ebel i gaxdes hesis kanonis gamoyeneba?

1) a; 2) b; \* 3) g; 4) arcerTi.

372. reaqciis produqtebis j amuri enTal pia  $-34kj$ -ia, xol o reagentebisa  $-40kj$ . rogoria reaqciis siTburi efeqti?

1) egzotermul ia; 2) endotermul ia; \* 3) siTburi efeqti nul ia; 4) egzergonul ia.

373. reaqciis produqtebis j amuri enTal pia  $-54kj$ -ia, xol o reagentebisa  $-44kj$ . rogoria reaqciis siTburi efeqti?

1) egzotermul ia; \* 2) endotermul ia; 3) siTburi efeqti nul ia; 4) egzergonul ia.

374. reaqciis produqtebis j amuri enTal pia  $-114kj$ -ia, xol o reagentebisa  $-114kj$ . rogoria reaqciis siTburi efeqti?

1) egzotermul ia; 2) endotermul ia; 3) siTburi efeqti nul ia; \* 4) egzergonul ia.

375. reaqciis produqtebis j amuri enTal pia  $-34kj$ -ia, xol o reaqcia endotermul ia. rogoria reaqciis reagentebis j amuri enTal pia?

1) reaqciis reagentebis j amuri enTal pia  $-35kj$  an nakl ebia; \*

2) reaqciis reagentebis j amuri enTal pia  $-33kj$  an metia;

3) reaqciis reagentebis j amuri enTal pia  $35kj$  an nakl ebia;

- 4) reaŋciis reagentebis j amuri enTal pia 33kj an metia.
376. reaŋciis produŋtebis j amuri enTal pia 4kj -ia, xol o reaŋcia egzoTermul ia. rogoria reaŋciis reagentebis j amuri enTal pia?
- 1) reaŋciis reagentebis j amuri enTal pia -5kj an nakl ebia;
  - 2) reaŋciis reagentebis j amuri enTal pia -3kj an metia;
  - 3) reaŋciis reagentebis j amuri enTal pia 5kj an nakl ebia;
  - 4) reaŋciis reagentebis j amuri enTal pia 5kj an metia. \*
377. reaŋciis produŋtebis j amuri enTal pia 20kj -ia, xol o reaŋcia endoTermul ia. rogoria reaŋciis reagentebis j amuri enTal pia?
- 1) reaŋciis reagentebis j amuri enTal pia -21kj an nakl ebia;
  - 2) reaŋciis reagentebis j amuri enTal pia -19kj an metia;
  - 3) reaŋciis reagentebis j amuri enTal pia 19kj an nakl ebia; \*
  - 4) reaŋciis reagentebis j amuri enTal pia 21kj an metia.
378. CamoTvl il Tagan, romel i qimiuri procesia ufro metad al baTuri, Tu igi xorciel deba: (a) entropiis zrdiT, (b) enTal piis zrdiT, (g) Sinagani energiis SemicirebiT?
- 1) mxol od a; 2) mxol od b; 3) a da g; \* 4) b da g.
379. CamoTvl il Tagan, romel i qimiuri procesia ufro nakl eb al baTuri, Tu igi xorciel deba: (a) entropiis zrdiT, (b) enTal piis zrdiT, (g) Sinagani energiis SemicirebiT?
- 1) mxol od a; 2) mxol od b; \* 3) a da g; 4) b da g.
380. CamoTvl il Tagan, romel i qimiuri procesia ufro metad al baTuri, Tu igi xorciel deba: (a) entropiis SemicirebiT, (b) enTal piis zrdiT, (g) Sinagani energiis SemicirebiT?
- 1) mxol od g; \* 2) mxol od b; 3) a da g; 4) b da g.
381. CamoTvl il Tagan, romel i qimiuri procesia ufro metad al baTuri, Tu igi xorciel deba: (a) entropiis zrdiT, (b) enTal piis SemicirebiT, (g) Sinagani energiis zrdiT?
- 1) mxol od a; 2) mxol od b; 3) a da g; 4) a da b. \*
382. CamoTvl il Tagan, romel i qimiuri procesia ufro nakl eb al baTuri, Tu igi xorciel deba: (a) entropiis SemicirebiT, (b) enTal piis SemicirebiT, (g) Sinagani energiis zrdiT?
- 1) mxol od a; 2) mxol od b; 3) a da g; \* 4) b da g.
383. CamoTvl il Tagan, romel i qimiuri procesia ufro nakl eb al baTuri, Tu igi xorciel deba: (a) entropiis SemicirebiT, (b) enTal piis zrdiT, (g) Sinagani energiis SemicirebiT?
- 1) mxol od a; 2) a da b; \* 3) a da g; 4) b da g.
384. ratomaa myari nivTierebebis entropia, rogorc wesi, airadi fazis nivTierebebis entropiaze nakl ebi?
- 1) myari nivTierebebis struŋtura nakl ebaa mowesrigebul i;
  - 2) airadi nivTierebebis struŋtura nakl ebaa mowesrigebul i; \*
  - 3) myari nivTierebebi xasiaTdeba brounis moZraobiT;
  - 4) airadi nivTierebis mikromdgomareobebis raodenoba nakl ebia.
385. ratomaa myari nivTierebebis entropia, rogorc wesi, Txevadi fazis nivTierebebis entropiaze nakl ebi?

- 1) myari nivTierebebis struqtura nakl ebaa mowesrigebul i;
- 2) Txevadi nivTierebebis struqtura metadaa mowesrigebul i;
- 3) Txevadi nivTierebebis mikromdgomareobebis raodenoba metia; \*
- 4) Txevadi nivTierebebis mikromdgomareobebis raodenoba nakl ebia.
386. ratomaa Txevadi nivTierebebis entropia, rogorc wesi, airadi fazis nivTierebebis entropiaze nakl ebi?
- 1) myari nivTierebebis struqtura nakl ebaa mowesrigebul i;
- 2) Txevadi nivTierebebis struqtura nakl ebadaa mowesrigebul i;
- 3) Txevadi nivTierebebis mikromdgomareobebis raodenoba metia;
- 4) Txevadi nivTierebebis mikromdgomareobebis raodenoba nakl ebia. \*
387. romel fazaSia mikromdgomareobebis raodenoba meti?
- 1) Txevadi;                    2) airadi; \*                    3) myari;                    4) erTnairia.
388. romel fazaSia mikromdgomareobebis raodenoba nakl ebi?
- 1) Txevadi;                    2) airadi;                    3) myari; \*                    4) erTnairia.
389. qvemoT CamoTvl il Tagan, romel fazaSia mikromdgomareobebis raodenoba nakl ebi, vidre erT-erT fazaSi da meti, vidre sxva fazaSi?
- 1) Txevadi; \*                    2) airadi;                    3) myari;                    4) aseTi faza ar arsebobs.
390. rogor aris damokidebul i sistemis qaosurobis xarisxi sistemis mikromdgomareobebis raodenobaze?
- 1) rac metia mikromdgomareobaTa raodenoba, miT metia sistemis qaosuroba;\*
- 2) rac nakl ebia mikromdgomareobaTa raodenoba, miT metia sistemis qaosuroba;
- 3) rac metia mikromdgomareobaTa raodenoba, miT nakl ebia sistemis qaosuroba;
- 4) zogadi saxis damokidebul eba ar SeiniSneba.
391. qvemoT CamoTvl il Tagan, romel i mosazrebaa mcdari?
- 1) absol utur nul ze maRal temperaturebze SeuZl ebel ia mTl iani Sinagani energiis moxmareba muSaobis Sesasrul ebl ad;
- 2) ar arsebobs procesi, roml is meSveobiTac SesaZl ebel ia izol irebul i sistemis entropiis Semicireba;
- 3) SeuZl ebel ia siTbos gadacema Tbil i sxel idan civze; \*
- 4) cal keul , ideal ur SemTxvevaSi sistemas SeiZl eba gaaCndes nul ovani entropia.
392. CamoTvl il Tagan, romel i tipis homogenuri reaqciebi iwvevs, rogorc wesi, entropiis zrdas: (a) Canacvl ebis, (b) mierTebis, (g) dissociaciis?
- 1) mxol od a; 2) mxol od b; 3) mxol od g; \* 4) a da g.
393. CamoTvl il Tagan, romel i tipis homogenuri reaqciebi iwvevs, rogorc wesi, entropiis Semicirebas: (a) Canacvl ebis, (b) mierTebis, (g) dissociaciis?
- 1) mxol od a; 2) mxol od b; \* 3) mxol od g; 4) a da g.
394. CamoTvl il Tagan, romel i tipis homogenuri reaqciebi iwvevs, rogorc wesi, entropiis umniSvnel o cvl il ebas: (a) Canacvl ebis, (b) mierTebis, (g) dissociaciis?
- 1) mxol od a; \* 2) mxol od b; 3) mxol od g; 4) a da g.

395. CamoTvl il Tagan, romel i tipis procesebi iwvevs, rogorc wesi, entropiis zrdas: (a) Canacvl ebis reaqciebi, (b) aorTql eba, (g) polimerizaciis reaqciebi?

1) mxol od a; 2) mxol od b;\* 3) mxol od g; 4) arcerTi.

396. CamoTvl il Tagan, romel i tipis reaqciebi iwvevs, rogorc wesi, entropiis Semicirebas: (a) Canacvl ebis, (b) mierTebis, (g) polimerizaciis?

1) mxol od a; 2) mxol od b; 3) mxol od g; 4) b da g. \*

397. CamoTvl il Tagan, romel i tipis reaqciebi iwvevs, rogorc wesi, entropiis zrdas: (a) hidrol izis, (b) mierTebis, (g) dissociaciis?

1) mxol od a; 2) mxol od b; 3) mxol od g; 4) a da g. \*

398. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) SO<sub>2</sub>; 3) P<sub>2</sub>O<sub>5</sub>; 3) N<sub>2</sub>; \* 4) O<sub>3</sub>.

399. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) SO<sub>2</sub>; 3) P<sub>2</sub>O<sub>5</sub>; 3) N<sub>2</sub>O; 4) O<sub>2</sub>. \*

400. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) S; \* 3) P<sub>2</sub>O<sub>5</sub>; 3) NO; 4) Fe<sub>2</sub>O<sub>3</sub>.

401. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) SO<sub>2</sub>; 3) P<sub>4</sub>; \* 3) N<sub>2</sub>O<sub>3</sub>; 4) O<sub>3</sub>.

402. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) SO<sub>3</sub>; 3) P<sub>2</sub>O<sub>5</sub>; 3) Na; \* 4) O<sub>3</sub>.

403. qvemoT CamoTvl il Tagan, romel i nivTierebis warmoqmnis enTal piaa nul is tol i?

1) SO<sub>2</sub>; 3) P<sub>2</sub>O<sub>5</sub>; 3) NCl<sub>3</sub>; 4) arcerTis. \*

404. rogori tipisaa sistema, Tu misi entropiis cvl il eba damokidebul ia mxol od temperaturaze da araa damokidebul i sistemis nawil akebis mol ebis ricxvis cvl il ebaze?

1) Ria; 2) izol irebul i; 3) Caketil i; \* 4) Ria an Caketil i.

405. rogori tipisaa sistema, Tu misi entropiis cvl il eba damokidebul ia rogorc temperaturaze, ise sistemis nawil akebis mol ebis ricxvis cvl il ebaze?

1) Ria; 2) izol irebul i; 3) Caketil i; 4) Ria an Caketil i. \*

406. rogori tipisaa sistema, Tu arcerT process SeuZl ia misi entropiis Semicireba?

1) Ria; 2) izol irebul i;\* 3) Caketil i; 4) Ria an Caketil i.

407. rogori tipisaa sistema, Tu misi erTi komponentis raodenoba Semicirda 1,2 mol idan 0,02 mol amde, meoris gaizarda 44,04 mol idan 45,22 mol amde, xol o sistemis mier miRebul i siTbos raodenobam Seadgina 45j ?

1) Ria; 2) izol irebul i; 3) Caketil i; 4) Ria an Caketil i. \*

408. როგორი ტიპისაა სისტემა, თუ მისი ენთალპია არ იცვლება, ხოლო ენთროპია შემცირდა?

1) რია; 2) იზოირებული; 3) ცაკეტილი; 4) რიანაცაკეტილი.\*

409. როგორი ტიპისაა სისტემა, თუ მისი ენთროპია ცვლილება დამოკიდებულია სისტემის ნაწილაკების მოცულობის ცვლილებაზე, ისე, რომ სისტემაში არ მიმდინარეობს ქიმიური რეაქცია?

1) რია; \* 2) იზოირებული; 3) ცაკეტილი; 4) რიანაცაკეტილი.

410. რას უდრის კალციუმის ჰიდროქსიდის ( $M=74$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი მართლმართლმდებარებს ფაზის მართლმართლმდებარებს?

1) 74;\* 2) 37; 3) 18,5; 4) 20.

411. რას უდრის მაგნიუმის ჰიდროქსიდის ( $M=58$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი მართლმართლმდებარებს ფაზის მართლმართლმდებარებს?

1) 58;\* 2) 29; 3) 19,3; 4) 14,5.

412. რას უდრის ფოსფორმართლმდებარებს ( $M=98$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი ნატრიუმის ჰიდროქსიდთან ურთიერთმდებარებს ნატრიუმის ჰიდროფოსფატს ურთიერთმდებარებს?

1) 98; 2) 49;\* 3) 32,7; 4) 24,5.

413. რას უდრის ფოსფორმართლმდებარებს ( $M=98$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი ნატრიუმის ჰიდროქსიდთან ურთიერთმდებარებს ნატრიუმის ფოსფატს ურთიერთმდებარებს?

1) 98; 2) 49; 3) 32,7;\* 4) 24,5.

414. რას უდრის კალიუმის დიკრომატის ( $M=294$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი არმდებარებს მართლმართლმდებარებს?

1) 294; 2) 98; 3) 49;\* 4) 73,5.

415. რას უდრის კალიუმის პერმანგანატის ( $M=158$  გ/მოლი) ეკვივალენტის მოლური მასა (გ/მოლი ეკვ), თუ იგი არმდებარებს მართლმართლმდებარებს?

1) 158; 2) 79; 3) 52,7; 4) 31,6.\*

416. კვანძის მოცულობის სიდიდეებიდან აირების დაწყებული ეკვივალენტის მოლური მასის მნიშვნელობები:

1) 11,2 ლ  $O_2$ , 22,4 ლ  $H_2$ ; 2) 11,2 ლ  $O_2$ , 11,2 ლ  $H_2$ ;

3) 5,6 ლ  $O_2$ , 11,2 ლ  $H_2$ ;\* 4) 22,4 ლ  $O_2$ ; 22,4 ლ  $H_2$ .

417. ერთნაირია თუ განსხვავებულია ნაერთები  $CrCl_3$  და  $Cr_2(SO_4)_3$  :

ა) კრისტალური ეკვივალენტის მოცულობის მნიშვნელობები; ბ) ამ ნაერთების ეკვივალენტის მოცულობის მნიშვნელობები?

1) ა) ერთნაირია, ბ) ერთნაირია; 2) ა) ერთნაირია, ბ) განსხვავებულია;\*

3) ა) განსხვავებულია, ბ) ერთნაირია; 4) ა) განსხვავებულია, ბ) განსხვავებულია.

418. ლითონის ეკვივალენტის მოლური მასა 12 გ/მოლი ეკვ. როგორია ლითონის ოქსიდის ეკვივალენტის მოლური მასის მნიშვნელობა (გ/მოლი ეკვ)?

1) 24; 2) 28; 3) 20;\* 4) 40.

419. ლითონის ოქსიდის ეკვივალენტის მოლური მასა 20 გ/მოლი ეკვ. როგორია ლითონის ეკვივალენტის მოლური მასის მნიშვნელობა (გ/მოლი ეკვ)?

1) 28; 2) 14; 3) 12;\* 4) 40.

420. რომელი ტიპის გარდაქმნის ეკვივალენტის კანონი?



$$1) \frac{m_1}{m_2} = \frac{M_{\text{ekv.2}}}{MM_{\text{ekv.1}}}; \quad 2) m_1 M_{\text{ekv.1}} = m_2 M_{\text{ekv.2}}; \quad 3) \frac{m_1}{m_2} = \frac{M_{\text{ekv.1}}}{MM_{\text{ekv.2}}}; *$$

$$4) m_1 \cdot m_2 = M_{\text{ekv.1}} \cdot M_{\text{ekv.2}}$$

421. romel i reaquiisaTvis emTxveva ekvival entobis wertil i neutral izaciis wertil s?

- 1) ZmarmJavas gatitvris dros natriumis tutiT;
- 2) azotmJavas gatitvris dros natriumis tutiT;\*
- 3) amiakis wyal xsnaris gatitvris dros maril mJavaTi;
- 4) fosformJavasa da natriumis tutis urTierTqmedebiT saSual o maril is warmoqmniis dros.

422. ras udris natriumis dihidrofosfatis ekvival entobis ricxvi reaquiisaSi:  
 $\text{NaH}_2\text{PO}_4 + \text{NaOH} \rightarrow \text{Na}_2\text{HPO}_4 + \text{H}_2\text{O} ?$

- 1) 1;\*
- 2) 2;
- 3) 3;
- 4) 1/3.

423. ras udris fosformJavas (M=98 g/mol i) ekvival entis mol uri masa (g/mol i ekv), Tu igi kal iumis tutesTan urTierTqmedebs kal iumis dihidrofosfatis warmoqmniT?

- 1) 49;
- 2) 98;\*
- 3) 32,7;
- 4) 31.

424. ras udris natriumis bromatisa da kal iumis iodidis ekvival entobis faqtorebi reaquiisaSi:  $\text{NaBrO}_3 + \text{KI} + \text{H}_2\text{SO}_4 \rightarrow \text{NaBr} + \text{I}_2 + \text{K}_2\text{SO}_4 + \text{H}_2\text{O} ?$

- 1) 5, 1;
- 2) 6, 1;
- 3) 1/6, 1; \*
- 4) 1/6, 2.

425. ras udris natriumis hidrokarbonatis (M= 84 g/mol i) ekvival entis mol uri masa (g/mol i ekv), Tu igi kal ciumis tutesTan urTierTqmedebs kal ciumis karbonatis warmoqmniT?

- 1) 84;
- 2) 24;
- 3) 42;\*
- 4) 168.

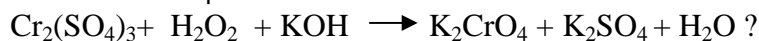
425. ras udris wyal badis peroqsidisa da gogirdwyal badis ekvival entobis faqtorebi reaquiisaSi:  $\text{H}_2\text{O}_2 + \text{H}_2\text{S} + \text{H}_2\text{SO}_4 + \text{H}_2\text{O} \rightarrow$

- 1) 1, 1/4;
- 2) 1/2, 1/8;\*
- 3) 2, 8;
- 4) 1/2, 1/4.

426. el ementis oqsidis ekvival entis mol uri masaa 31. daadgineT el ementi.

- 1) Na;\*
- 2) P;
- 3) N;
- 4) Cu.

427. ras udris qromis sul fatis ekvival entobis faqtorebi reaquiisaSi:



- 1) 3;
- 2) 1/3;
- 3) 6;
- 4) 1/6.\*

428. rogor icvl eba gaxsnil i nivTierebis raodenoba xsnaris ganzavebisas?

- 1) izrdeba;
- 2) ar icvl eba; \*
- 3) mcirdeba;
- 4) j er izrdeba, Semdeg mcirdeba.

429. rogor icvl eba gaxsnil i nivTierebis masuri wili xsnaris ganzavebisas?

- 1) izrdeba;
- 2) ar icvl eba;
- 3) mcirdeba; \*
- 4) j er izrdeba, Semdeg mcirdeba.

430. rogor icvl eba gaxsnil i nivTierebis masuri wili xsnaris dakoncentrierebisas?

- 1) izrdeba; \*
- 2) ar icvl eba;
- 3) mcirdeba;
- 4) j er izrdeba, Semdeg mcirdeba.

431. qvemoT CamoTvl il Tagan, ras axasiaTebis raul is kanoni?

- 1) xsnaris komponentis najeri orTql is wnevas; \*
- 2) airis xsnadobas;
- 3) najeri orTql is Sedgenil obas;
- 4) parcial ur wnevas.

432. qvemoT CamoTvl il Tagan, romel s axasiaTebis henris kanoni?

- 1) xsnaris komponentis naj eri orTql is wnevas; 2) airis xsnadobas; \* 3) naj eri orTql is Sedgenil obas; 4) parcial ur wnevas.
433. ra ewodeba gaxsnil i nivTierebis mol ebis ricxvis fardobas gamxsnel is kil ogramebis ricxvTan?
- 1) mol aroba; 2) mol al oba; \* 3) mol uri wil i; 4) titri.
434. ra ewodeba gaxsnil i nivTierebis mol ebis ricxvis fardobas xsnaris l itrebis ricxvTan?
- 1) mol aroba; \* 2) mol al oba; 3) mol uri wil i; 4) titri.
435. ra ewodeba gaxsnil i nivTierebis ekvivalentis mol ebis ricxvis fardobas xsnaris l itrebis ricxvTan?
- 1) mol aroba; 2) mol al oba; 3) mol uri wil i; 4) normal oba. \*
436. ra ewodeba gaxsnil i nivTierebis mol ebis ricxvis fardobas gamxsnel isa da gaxsnil i nivTierebebis mol ebis ricxvis j amTan?
- 1) mol aroba; 2) mol al oba; 3) mol uri wil i; \* 4) titri.
437. qvemoT CamoTvl il Tagan, xsnaris Sedgenil obis raodenobrivi gamosaxvis romel i sidide gamoiyeneba osmosuri wnevis gasazRvrisas?
- 1) mol aroba; \* 2) mol al oba; 3) mol uri wil i; 4) titri.
438. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturaze nakl ebia. ra SeiZl eba iTqvas maril is hidrataciis energiaz?
- 1) igi kristal uri mesris daSl is energiaz nakl ebia; \*
- 2) igi kristal uri mesris daSl is energiaz metia;
- 3) igi kristal uri mesris daSl is energiis tol ia;
- 4) misi hidrataciis energia nul is tol ia.
439. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturaze metia. ra SeiZl eba iTqvas maril is hidrataciis energiaz?
- 1) igi kristal uri mesris daSl is energiaz nakl ebia;
- 2) igi kristal uri mesris daSl is energiaz metia; \*
- 3) igi kristal uri mesris daSl is energiis tol ia;
- 4) misi hidrataciis energia nul is tol ia.
440. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturis tol ia. ra SeiZl eba iTqvas maril is hidrataciis energiaz?
- 1) igi kristal uri mesris daSl is energiaz nakl ebia;
- 2) igi kristal uri mesris daSl is energiaz metia;
- 3) igi kristal uri mesris daSl is energiis tol ia; \*
- 4) misi hidrataciis energia nul is tol ia.
441. ratom ar civdeba xsnari, sawyis sufta gamxsnel Tan SedarebiT, roca gaxsnil i nivTiereba airad fazaSia?
- 1) airi gaxsnis Semdeg myar mdgomareobaSi gadadis;
- 2) airis kristal uri mesris daSl is energia mcirea;
- 3) airis gaxsna ar saWiroebs energiis daxarj vas misi kristal uri struqturis destruqciisaTvis; \*
- 4) airis hidrataciis energia nul is tol ia.

442. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturaze nakl ebia. sufTa gamxsnel Tan SedarebiT, moimatebs Tu moikl ebs xsnaris duRil is temperatura?

- 1) yovel Tvis moikl ebs;
- 2) Tu maril i amorful ia, maSin moimatebs;
- 3) moimatebs mxol od uiSviaTesi, araionuri tipis maril ebisaTvis;
- 4) yovel Tvis moimatebs. \*

443. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturaze nakl ebia. gamxsnel Tan SedarebiT, moimatebs Tu moikl ebs xsnaris kristal izaciis temperatura?

- 1) yovel Tvis moikl ebs; \*
- 2) Tu maril i amorful ia, maSin moimatebs;
- 3) moimatebs mxol od uiSviaTesi, araionuri tipis maril ebisaTvis;
- 4) yovel Tvis moimatebs.

444. romel ime maril is wyal Si gaxsnis Sedegad miRebul i xsnaris temperatura gamxsnel is sawyis temperaturaze nakl ebia. ra SeiZl eba iTqvas maril is kristal uri mesris daSl is energiaze?

- 1) igi hidrataciis energiaze nakl ebia;
- 2) igi hidrataciis energiaze metia; \*
- 3) igi hidrataciis energiis tol ia;
- 4) misi kristal uri mesris daSl is energia nul is tol ia.

445. qvemoT CamoTvl il Tagan romel movl enas ukavSirdeba gamxsnel is gadatana dabal i koncentraciis xsnaridan maRal i koncentraciis xsnarisaken naxebradSeRwevadi membranis gavliT?

- 1) xsnaris gaj ereba; 2) ganzaveba; 3) difuzia 4) osmosi \*

446. qvemoT CamoTvl il Tagan romel movl enas ukavSirdeba gaxsnil i nivTierebis gadatana maRal i koncentraciis xsnaridan dabal i koncentraciis xsnarisaken?

- 1) xsnaris gaj ereba; 2) ganzaveba; 3) difuzia; \* 4) osmosi.

447. mol ekul uri kristal uri struqturis mqone myari nivTierebebis an susti mol ekul aTaSorisi bmebis mqone siTxeebis gaxsnis procesi egzoTermul ia, radgan:

- 1)  $|\Delta H_{kr.mesr.}| > |\Delta H_{sol v.}|$ ; 2)  $|\Delta H_{kr.mesr.}| < |\Delta H_{sol v.}|$ ; \*
- 3)  $\Delta H_{kr.mesr.} = 0$ ; 4)  $\Delta H_{sol v.} = 0$ .

448. rogor icvl eba enTal pia da entropia siTxeebSi myari da Txevadi nivTierebebis gaxsnis as?

- 1) enTal pia SeiZl eba Semcirdes an gaiyardos, entropia mcirdeba;
- 2) enTal pia izrdeba, entropia izrdeba;
- 3) enTal pia SeiZl eba Semcirdes an gaiyardos, entropia izrdeba; \*
- 4) enTal pia SeiZl eba Semcirdes an gaiyardos, entropia ar icvl eba.

449. rogor icvl eba enTal pia da entropia siTxeebSi airebis gaxsnis as?

- 1) enTal pia mcirdeba, entropia mcirdeba; \*
- 2) enTal pia mcirdeba, entropia izrdeba;
- 3) enTal pia izrdeba, entropia mcirdeba;
- 4) enTal pia izrdeba, entropia izrdeba.

450. CamoTvl il i mosazrebebidan romel ia araswori?

- 1) Termodinamikuri Tval sazrisiT gaxsna TviTmimdinare procesia;
- 2) xsnaris warmoqmnis Termodinamikuri pirobaa gibsis energiis Semcireba;
- 3) el eqtrol itTa xsnarebSi gamxsnel i is nivTierebaa, romel ic meti raodenobiT aris xsnarSi;\*
- 4) Tu gaxsnis procesi endoTermul ad mimdinareobs, TAS meti unda iyos  $\Delta H$ -ze.

451. CamoTvl il i mosazrebebidan romel ia araswori?

- 1) airTa xsnadoba temperaturis gazrdiT izrdeba;\*
- 2) henris kanoni ar srul deba, Tu gaxsnil i airis mol ekul ebi gamxsnel Tan urTierTqmedebs;
- 3) henris kanonis gamovl inebaa kesonuri daavadeba;
- 4) henris kanoni mxol od ganzavebul i xsnarebisaTvis aris samarTI iani.

452. seCenovis kanonis Tanaxmad, airTa xsnadoba siTxeebSi:

- 1) el eqtrol itebis damatebisas ar icvl eba;
- 2) el eqtrol itebis damatebisas izrdeba;
- 3) el eqtrol itebis damatebisas mcirdeba;\*
- 4) damokidebul i ar aris narevis saerTo wnevasa da sxva komponentebis individual obaze.

453. wyal s ar axasiaTebis:

- 1) MmaRal i siTbotevadoba;
- 2) aorTql ebis mcire siTbo;\*
- 3) maRal i diel eqtrikul i SeRwevadoba;
- 4) pol aroba.

454. xsnari ideal uria, Tu:

- 1) komponentebis Soris xorciel deba qimiuri urTierTqmedeba;
- 2) Serevisas gvaqvs siTburi efeqti;
- 3) komponentebis Soris arsebobs urTierTqmedebis Zal ebi;
- 4) Serevisas ar icvl eba jamuri mocul oba.\*

455. CamoTvl il i mosazrebebidan romel ia araswori?

- 1) ebul ioskopuri da krioskopul i mudmivebis sidide damokidebul ia gaxsnil i nivTierebis bunebaze;\*
- 2) nivTierebis mol uri masis gamoTvl is meTods, gayinvis temperaturis dawevis mniSvnel obis gansazRvriT, krioskopuri meTodi ewodeba;
- 3) sufTa gamxsnel Tan SedarebiT xsnaris duRil is temperaturis aweva da gayinvis temperaturis daweva gaxsnil i nivTierebis mol al uri koncentracis proporciul ia;
- 4) ganzavebul i xsnarebisaTvis gamxsnel is najeri orTql is fardobiTi Semcireba gaxsnil i nivTierebis mol uri wil is tol ia.

456. qvemoT moyvanil i debul ebebidan romel ia swori?

- 1) ebul ioskopuri da krioskopul i mudmivebis sidide damokidebul ia gamxsnel is bunebaze;\*
- 2) mudmivi temperaturis dros xsnaris zemoT gamxsnel is najeri orTql is wnevis fardobiTi daweva gaxsnil i araaqrol adi nivTierebis masis tol ia;
- 3) sufTa gamxsnel Tan SedarebiT xsnaris duRil is temperaturis aweva da gayinvis temperaturis daweva gaxsnil i nivTierebis masis proporciul ia;
- 4) nivTierebis mol uri masis gamoTvl is meTods, gayinvis temperaturis dawevis mniSvnel obis gansazRvriT, ebul ioskopuri meTodi ewodeba.

457. qvemoT moyvanil i debul ebebidan romel ia araswori?

1) naxevradSeRwevadi membranis gavl iT gamxsnel is mol ekul ebis TavistTavad difuzias osmosi ewodeba;

2) osmosuri wneva gamoiTvl eba formul iT:  $\pi=c(x)RT$ ;

3) el eqtrol itebisaTvis osmosuri wneva dakavSirebul ia mis mol ur koncentraciasTan difuziis koeficientiT;\*

4) uj redis drekadoba ganpirobepul ia osmosuri wneviT.

458. ramdenjer aRemateba rkinis (111) ql oridis 1 mol i/l koncentraciis xsnaris osmosuri wneva imave koncentraciis Saqris wyal xsnaris osmosur wnevas?

1) 3-j er; 2) 4-j er;\* 3) 2-j er; 3) erTnairia.

459. ramdenjer aRemateba rkinis (111) sul fatis 1 mol i/l koncentraciis xsnaris osmosuri wneva imave koncentraciis Saqris wyal xsnaris osmosur wnevas?

1) 3-j er; 2) 4-j er; 3) 5-j er;\* 3) erTnairia.

460. ramdenjer aRemateba kal ciumis nitratis 1 mol i/l koncentraciis xsnaris osmosuri wneva imave koncentraciis Saqris wyal xsnaris osmosur wnevas?

1) 3-j er;\* 2) 4-j er; 3) 5-j er; 3) erTnairia.

461. ramdenjer aRemateba al uminis ql oridis 1 mol i/l koncentraciis xsnaris osmosuri wneva imave koncentraciis Saqris wyal xsnaris osmosur wnevas?

1) 3-j er; 2) 4-j er;\* 3) 5-j er; 3) erTnairia.

462. CamoTvl il i faqtorebidan romel zea damokidebul i osmosuri wneva?

1) mocul obis erTeul Si gaxsnil i nivTierabis masaze;

2) mocul obis erTeul Si gaxsnil i nivTierabis nawil akTa mocul obaze;

3) gaxsnil i nivTierabis bunebase;

4) temperaturaze.\*

463. qvemoT CamoTvl il i nivTierabis erTnairi mol uri koncentraciis xsnarebis romel i ganl ageba Seesabameba osmosuri wnevis Semicirebas?

1)  $CH_3COOH - NaCl - C_6H_{12}O_6 - CaCl_2$ ;

2)  $C_6H_{12}O_6 - CH_3COOH - NaCl - CaCl_2$ ;

3)  $CaCl_2 - NaCl - CH_3COOH - C_6H_{12}O_6$ ,\*

4)  $CaCl_2 - CH_3COOH - C_6H_{12}O_6 - NaCl$ .

464. qvemoT CamoTvl il i nivTierabis erTnairi mol uri koncentraciis xsnarebis romel i ganl ageba Seesabameba osmosuri wnevis gazrdas?

1)  $CH_3COOH - NaCl - C_6H_{12}O_6 - CaCl_2$ ;

2)  $C_6H_{12}O_6 - CH_3COOH - NaCl - CaCl_2$ ;

3)  $CaCl_2 - NaCl - CH_3COOH - C_6H_{12}O_6$ ,

4)  $CaCl_2 - CH_3COOH - C_6H_{12}O_6 - NaCl$ .

465. xsnarebs ewodeba izotonuri, Tu maT aqvT:

1) gaxsnil i nivTierabis erTnairi masuri wil i;

2) erTnairi mol al uri koncentracia;

3) gaxsnil i nivTierabis erTnairi mol uri wil i;

4) erTnairi osmosuri wneva.\*

466. CamoTvl il i mosazrebebidan romel ia araswori?

1) difuzia mimdinareobs maRal i koncentraciidan dabal i koncentraciis mimaRTul ebiT;

2) TviTmimdinare difuzias maRal i koncentraciis xsnaridan dabal i koncentraciis xsnarSi, naxevradSeRwevadi membranis gavl iT, osmosi ewodeba;\*

3) vant-hofis kanoni amyarebs damokidebul ebas osmosur wnevasa da gaxsnil i nivTierebis mol ur koncentracias Soris;

4) gamxsnel is najeri orTql is wnevis fardobiTi Semcireba araaqrol adi arael eqtrol itis xsnaris zedapirze gaxsnil i nivTierebis mol uri wil is tol ia.

467. vant-hofis kanoni el eqtrol itebisaTvis Semdegnairad Caiwereba:

1)  $= c(x)RT$ ; 2)  $= mRT/Mv$ ; 3)  $= mRT/Mv$ ; 4)  $= c(x)RT$ .\*

468. CamoTvl il i mosazrebebidan romel ia swori?

1) osmosuri wneva tol ia im wnevisa, romel sac Seqmnida gaxsnil i nivTiereba, Tu igi ideal uri airis saxiT daikavebda xsnaris mocul obas imave temperaturaze;\*

2) Tu xsnari sisxl is mimaRT hipertonus ia, adgil i aqvs hemol izs;

3) araaqrol adi nivTierebis xsnaris zedapirze najeri orTql is wneva metia, vidre sufTa gamxsnel is zedapirze;

4) gamxsnel is najeri orTql is fardobiTi Semcireba araaqrol adi arael eqtrol itis xsnaris zedapirze gaxsnil i nivTierebis masuri wil is tol ia.

469. protol ituri TeoriiT wyal xsnarSi amfol itebs miekuTvneba:

1)  $\text{HCO}_3^-$ ; \* 2)  $\text{H}_3\text{PO}_4$ ; 3)  $\text{SO}_4^{2-}$  4)  $\text{SO}_3^{2-}$  .

470. qvemoT CamoTvl il i nawil akebidan:  $\text{H}_2\text{SO}_4$ ,  $\text{HCOOH}$ ,  $\text{OH}^-$ ,  $\text{HPO}_4^{2-}$ ,  $\text{HCO}_3^-$ , wyal xsnarSi protol ituri TeoriiT ramdenia amfol iti?

1) 1; 2) 2; \* 3) 3; 4) 0.

471. qvemoT dasaxel ebul i ionebidan romel s SeuZl ia gamovides rogorc brensted-I ouris fuZis, ise brensted-I ouris mJavas rol Si?

1)  $\text{HSO}_4^-$ ; \* 2)  $\text{NH}_4^+$ ; 3)  $\text{H}_3\text{PO}_4$ ; 4)  $\text{S}^{2-}$ .

472. brensted-I ouris Teoriis mixedviT, CamoTvl il i nawil akebidan romel i avl ens erTdroul ad rogorc mJavas, ise fuZis Tvisebebs?

1)  $\text{HS}^-$ ; \* 2)  $\text{S}^{2-}$ ; 3)  $\text{HCl}$ ; 4)  $\text{H}_3\text{O}^+$ .

473. brensted-I ouris Teoriis mixedviT, CamoTvl il i nawil akebidan romel i avl ens erTdroul ad rogorc mJavas, ise fuZis Tvisebebs?

1)  $\text{H}_2\text{S}$ ; 2)  $\text{S}^{2-}$ ; 3)  $\text{HCl}$ ; 4)  $\text{H}_2\text{O}$ .\*

474. brensted-I ouris Teoriis mixedviT, CamoTvl il i nawil akebidan romel i avl ens erTdroul ad rogorc mJavas, ise fuZis Tvisebebs?

1)  $\text{OH}^-$ ; 2)  $\text{S}^{2-}$ ; 3)  $\text{HCO}_3^-$ ; \* 4)  $\text{H}_3\text{O}^+$ .

475. brensted-I ouris Teoriis mixedviT, CamoTvl il i nawil akebidan romel i avl ens erTdroul ad rogorc mJavas, ise fuZis Tvisebebs?

1)  $\text{OH}^-$ ; 2)  $\text{HSO}_4^-$ ; \* 3)  $\text{H}_2\text{CO}_3$ ; 4)  $\text{H}_3\text{O}^+$ .

476. qvemoT CamoTvl il i nawil akebidan:  $\text{HSO}_4^-$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{OH}^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{HCl}$  wyal xsnarSi protol ituri TeoriiT ramdenia amfol iti?

- 1) 1; 2) 2; \* 3) 3; 4) 4.
477. qvemoT CamoTvl il i nawil akebidan:  $\text{SO}_4^-$ ,  $\text{CH}_3\text{COO}^-$ ,  $\text{OH}^-$ ,  $\text{HPO}_4^{2-}$ ,  $\text{HS}^-$  wyal xsnarSi protol ituri TeoriiT ramdenia amfol iti?
- 1) 1; 2) 2; \* 3) 3; 4) 4.
478. qvemoT CamoTvl il i nawil akebidan:  $\text{HCO}_3^-$ ,  $\text{H}_2\text{O}$ ,  $\text{OH}_3^+$ ,  $\text{HPO}_3^{2-}$ ,  $\text{NH}_3$  wyal xsnarSi protol ituri TeoriiT ramdenia mJava?
- 1) 1; 2) 2; 3) 3; 4) 4. \*
479. qvemoT CamoTvl il i nawil akebidan:  $\text{HSO}_4^-$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{OH}^-$ ,  $\text{PO}_4^{3-}$ ,  $\text{HCl}$  wyal xsnarSi protol ituri TeoriiT ramdenia mJava?
- 1) 1; 2) 2; 3) 3; \* 4) 4.
480. qvemoT CamoTvl il i nawil akebidan:  $\text{HSO}_4^-$ ,  $\text{CH}_3\text{COO}^-$ ,  $\text{OH}^-$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{HCl}$  wyal xsnarSi protol ituri TeoriiT ramdenia fuZe?
- 1) 1; 2) 2; 3) 3; 4) 4. \*
481. qvemoT CamoTvl il i nawil akebidan:  $\text{SO}_4^{2-}$ ,  $\text{CH}_3\text{COOH}$ ,  $\text{OH}_3^+$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{NH}_3$  wyal xsnarSi protol ituri TeoriiT ramdenia fuZe?
- 1) 1; 2) 2; 3) 3; \* 4) 4.
482. brensted-l ouris Teoriis mixedviT, ras warmoadgens gogirdmJavaSi gaxsnili ZmarmJava?
- 1) mJavas 2) fuZes \* 3) amfol its 4) maril s
483. brensted-l ouris Teoriis mixedviT, ras warmoadgens Txevad amiakSi gaxsnil i ZmarmJava?
- 1) mJavas \* 2) fuZes 3) amfol its 4) maril s
484. brensted-l ouris Teoriis mixedviT, koncentrirebul gogirdmJavaSi ra warmoadgens gogirdmJavas SeuRI ebul fuZes?
- 1)  $\text{H}_3\text{SO}_4^+$  2)  $\text{H}_2\text{SO}_4$  3)  $\text{HSO}_4^-$  \* 4)  $\text{SO}_4^-$
485. brensted-l ouris Teoriis mixedviT, koncentrirebul gogirdmJavaSi ra warmoadgens gogirdmJavas SeuRI ebul mJavas?
- 1)  $\text{H}_3\text{SO}_4^+$  \* 2)  $\text{H}_2\text{SO}_4$  3)  $\text{HSO}_4^-$  4)  $\text{SO}_4^-$
486. brensted-l ouris Teoriis mixedviT, ras warmoadgens hidrokarbonat-ioni wyal Si?
- 1) mJavas 2) fuZes 3) amfol its \* 4) maril s
487. brensted-l ouris Teoriis mixedviT, qvemoTCamoTvl il Tagan romel i warmoadgens fuZes Txevad amiakSi?
- 1)  $\text{NaOH}$  2)  $\text{NaCl}$  3)  $\text{NaNO}_3$  4)  $\text{NaNH}_2$  \*
488. brensted-l ouris Teoriis mixedviT, ras warmoadgens Txevad amiakSi gaxsnil i natriumis tute?
- 1) mJavas 2) fuZes 3) amfol its 4) maril s \*
489.  $\text{H}_2\text{AsO}_4^-$ -is SeuRI ebul i fuZea:
- 1)  $\text{H}_3\text{AsO}_4$ ; 2)  $\text{HAsO}_4^-$ ; 3)  $\text{HAsO}_4^{2-}$ ; \* 4)  $\text{AsO}_4^{3-}$ ;
490.  $\text{H}_2\text{PO}_4^-$ -is SeuRI ebul i fuZea:
- 1)  $\text{H}_3\text{PO}_4$ ; 2)  $\text{HPO}_4^-$ ; 3)  $\text{HPO}_4^{2-}$ ; \* 4)  $\text{PO}_4^{3-}$ ;
491. CamoTvl il i nawil akebidan romel ia anionuri mJava?
- 1)  $\text{OH}^-$ ; 2)  $\text{H}_2\text{CO}_3$ ; 3)  $\text{HS}^-$ ; \* 4)  $\text{NH}_4^+$ ;
492. CamoTvl il i ionebidan romel ia anionuri mJava?

- 1)  $\text{OH}^-$ ;            2)  $\text{H}_2\text{PO}_4^-$ ; \*    3)  $\text{NH}_4^+$ ;        4)  $\text{NH}_2\text{-NH}_3^+$ ;  
 493. CamoTvl il i ionebidan romel ia kationuri fuZe?  
 1)  $\text{OH}^-$ ;            2)  $\text{H}_2\text{PO}_4^-$ ;    3)  $\text{NH}_4^+$ ;        4)  $\text{NH}_2\text{-NH}_3^+$ ; \*  
 494. CamoTvl il i naerTebidan romel ia l uisis mJava?  
 1)  $\text{H}_3\text{BO}_3$ ; 2)  $\text{BF}_3$ ; \* 3)  $\text{NH}_3$ ; 4)  $\text{NaCl}$ ;  
 495. qvemoT moyvanil i nawil akebidan romel ia l uisis mJava?  
 1)  $\text{H}_2\text{O}$ ; 2)  $\text{F}^-$ ;        3)  $\text{NH}_3$ ;        4)  $\text{BCl}_3$ . \*  
 496. CamoTvl il i naerTebidan romel ia l uisis mJava?  
 1)  $\text{H}_3\text{BO}_3$ ; 2)  $\text{AlCl}_3$ ; \* 3)  $\text{NH}_3$ ; 4)  $\text{NaCl}$ ;  
 498. CamoTvl il i naerTebidan romel ia areniuis mJava?  
 1)  $\text{H}_3\text{BO}_3$ ; \* 2)  $\text{BF}_3$ ; 3)  $\text{NH}_3$ ; 4)  $\text{NaCl}$ ;  
 499. CamoTvl il i naerTebidan romel ia brenstedis mJava?  
 1)  $\text{K}_3\text{BO}_3$ ; 2)  $\text{BF}_3$ ; 3)  $\text{H}_3\text{O}^+$ ; \* 4)  $\text{NaCl}$ ;  
 500. CamoTvl il i naerTebidan romel ia l uisis fuZe?  
 1)  $\text{H}_3\text{BO}_3$ ; 2)  $\text{BF}_3$ ; 3)  $\text{NH}_3$ ; \* 4)  $\text{NaCl}$ ;  
 501. CamoTvl il i naerTebidan romel ia brenstedis fuZe?  
 1)  $\text{H}_3\text{BO}_3$ ; 2)  $\text{BF}_3$ ; 3)  $\text{NH}_3$ ; \* 4)  $\text{NaCl}$ ;  
 502. xisti mJavaa:  
 1)  $\text{Mg}^{2+}$ ; \* 2)  $\text{Ag}^+$ ;            3)  $\text{Pt}^{2+}$ ;            3)  $\text{Ba}^{2+}$ .  
 503. xisti fuZea:  
 1)  $\text{SO}_4^{2-}$ ; 2)  $\Gamma$ ;        3)  $\text{NH}_3$ ; \*    4)  $\text{PH}_3$ .  
 504. ra axasiaTebis rbil fuZeebs?  
 1) donorul i atomebis mcire zomebi; 2) maRal i pol aroba;  
 3) maRal i el eqtrouaryofiToba; 4) maRal i pol arizebadoba.\*  
 505. ra axasiaTebis rbil mJavebs?  
 1) aqceptorul i atomebis mcire zomebi;  
 2) aqceptorul i atomebis maRal i el eqtrouaryofiToba;  
 3) aqceptorul i atomebis maRal i Jangvis xarisxi;  
 4) maRal i pol arizebadoba.\*  
 506. ra axasiaTebis xist fuZeebs?  
 1) donorul i atomebis mcire zomebi; \*  
 2) maRal i el eqtrouaryofiToba;  
 3) maRal i pol aroba; 4) maRal i pol arizebadoba.  
 507. ra axasiaTebis xist mJavebs?  
 1) aqceptorul i atomebis mcire zomebi; \*  
 2) aqceptorul i atomebis dabal i el eqtrouaryofiToba;  
 3) aqceptorul i atomebis dabal i Jangvis xarisxi;  
 4) maRal i pol arizebadoba.  
 508.  $\text{H}^+$  aris:  
 1) xisti mJava; \* 2) rbil i mJava; 3) xisti fuZe; 4) rbil i fuZe.  
 509.  $\text{H}^-$  aris:  
 1) xisti mJava; 2) rbil i mJava; 3) xisti fuZe; 4) rbil i fuZe.\*  
 510.  $\text{OH}^-$  aris:  
 1) xisti mJava; 2) rbil i mJava; 3) xisti fuZe; \* 4) rbil i fuZe.  
 511. Tu  $[\text{H}^+]=10^{-3}$  mol / l ,  $[\text{OH}^-]$  ionTa koncentracia tol i iqneba:



- 1)  $10^{-11}$ ;\* 2)  $10^{-7}$ ; 3)  $10^{-12}$ ; 4)  $10^{-3}$ .
512. Tu  $[H^+]=10^{-2}$  mol /l ,  $[OH^-]$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-7}$ ; 3)  $10^{-12}$ ;\* 4)  $10^{-3}$ .
513. Tu  $[OH^-]=10^{-5}$  mol /l ,  $[H^+]$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-7}$ ; 3)  $10^{-12}$ ; 4)  $10^{-9}$ .\*
514. Tu  $[OH^-]=10^{-4}$  mol /l ,  $[H^+]$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-7}$ ; 3)  $10^{-10}$ ;\* 4)  $10^{-3}$ .
515. Tu  $[OH^-]=10^{-1}$  mol /l ,  $[H^+]$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-7}$ ; 3)  $10^{-13}$ ;\* 4)  $10^{-3}$ .
516. xsnars aqvs Zl ieri tute reaqcia Tu misi pH aris:  
1) 12,4;\* 2) 7,9; 3) 6,2; 4) 1,7.
517. xsnars aqvs Zl ieri mJava reaqcia Tu misi pH aris:  
1) 11,2; 2) 7,3; 3) 6,5; 4) 1,0.\*
518. xsnars aqvs susti tute reaqcia Tu misi pH aris:  
1) 11,2; 2) 7,4;\* 3) 6,9; 4) 1,1.
519. xsnars aqvs susti mJava reaqcia Tu misi pH aris:  
1) 11,2; 2) 7,3; 3) 6,8;\* 4) 1,4.
520. Tu xsnaris pH=4, misi pOH tol i iqneba:  
1) 10;\* 2) 11; 3) 6; 4) 4.
521. Tu pH=5,  $OH^-$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-9}$ ;\* 3)  $10^{-5}$ ; 4)  $10^{-7}$ .
522. Tu pH=2,  $OH^-$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-7}$ ; 3)  $10^{-12}$ ;\* 4)  $10^{-2}$ .
523. Tu pH=11,  $[OH^-]$  ionTa koncentracia tol i iqneba:  
1)  $10^{-11}$ ; 2)  $10^{-3}$ ;\* 3)  $10^{-4}$ ; 4)  $10^{-10}$ .
524. Seuries tol i mocul obis A xsnari, romel Sic  $[H^+]=2 \cdot 10^{-4}$  mol /l da B xsnari, romel Sic  $[H^+]=2 \cdot 10^{-8}$  mol /l . miRebul i xsnaris pH tol ia:  
1) 4;\* 2) 8; 3) 12; 4) 6.
525. CamoTvl il i biol ogiuri siTxeebidan roml is pH aris yvel aze dabal i?  
1) pankreatul i wveni; 2) kuWis wveni;\*  
3) wvri l i nawl avis wveni; 4) zurgis tvinis siTxe.
526. henderson-hasel baxis gantol ebis mixedviT, SeiniSneba Semdegi kanonzomiereba:  
1) mJava miT sustia, rac metia SeuRI ebul i fuZisa da aradisoci rebul i mJavas wonasworul i koncentraciebis fardoba;  
2) mJava miT Zl ieria, rac metia SeuRI ebul i fuZisa da aradisoci rebul i mJavas wonasworul i koncentraciebis fardoba; \*  
3) mJava miT Zl ieria, rac metia mJavas sawyisi koncentracia;  
4) mJava miT Zl ieria, rac ufro nakl ebia mJavas sawyisi koncentracia.
527. henderson-hasel baxis gantol ebis mixedviT, SeiniSneba Semdegi kanonzomiereba:  
1) susti mJavas SeuRI ebul i fuZe aseve sustia;  
2) susti mJavas SeuRI ebul i fuZe Zl ieri fuZea; \*

- 3) Zl ieri mJavas SeuRI ebul i fuZe aseve Zl ieria;
- 4) rac ufro nel a disocirdeba mJava, miT ufro dabal ia pH.
528. qvemoT CamoTvl il Tagan, romel i daskvna ar gamomdinareobs henderson-hasel baxis gantol ebidan?
- 1) rac nakl ebia mJavas disociaciis konstanta, miT Zl ieria mJava; \*
- 2) mJavas naxevardisociaciisas,  $pK_a = pH$ ;
- 3) Zl ieri mJavas SeuRI ebul i fuZe sustia;
- 4) rac metia mJavas disociaciis konstanta, miT Zl ieria mJava.
529. qvemoT CamoTvl il Tagan romel i maril is ekval entobis ricxvi emTxveva rkina(II)-is oqsidis ekval entobis ricxvs?
- 1) FeN; 2) FeS<sub>2</sub>; 3) FeS; \* 4) FePO<sub>4</sub>.
530. qvemoT CamoTvl il Tagan romel i maril is ekval entobis ricxvi emTxveva qrom(III)-is oqsidis ekval entobis ricxvis naxevars?
- 1) Cr<sub>2</sub>S<sub>3</sub>; 2) Cr(PO<sub>3</sub>)<sub>3</sub>; \* 3) K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>; 4) CrSO<sub>4</sub>.
531. qvemoT CamoTvl il Tagan romel i maril is ekval entobis ricxvi emTxveva magniumis oqsidis ekval entobis ricxvs?
- 1) CrN; 2) FeS<sub>2</sub>; 3) Al<sub>2</sub>S<sub>3</sub>; 4) FeSO<sub>4</sub>. \*
532. qvemoT CamoTvl il Tagan romel i oqsidis ekval entobis ricxvi emTxveva rkina(II)-is ql oridis ekval entobis ricxvs?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Fe<sub>3</sub>O<sub>4</sub>; 3) Cr<sub>2</sub>O<sub>3</sub>; 4) Ag<sub>2</sub>O. \*
533. CamoTvl il Tagan romel i maril is ekval entobis ricxvi aRemateba xuTs?
- 1) FeN; 2) FeS<sub>2</sub>; 3) Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>; \* 4) FePO<sub>4</sub>.
534. CamoTvl il Tagan romel i oqsidis ekval entobis ricxvia eqvsze nakl ebi?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Fe<sub>3</sub>O<sub>4</sub>; 3) Cr<sub>2</sub>O<sub>3</sub>; 4) MgO. \*
535. CamoTvl il Tagan romel i oqsidis ekval entobis ricxvi aRemateba eqvss?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Fe<sub>3</sub>O<sub>4</sub>; \* 3) Cr<sub>2</sub>O<sub>3</sub>; 4) MgO.
536. CamoTvl il Tagan romel i naerTis ekval entobis ricxvia umciresi?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Fe<sub>3</sub>O<sub>4</sub>; 3) N<sub>2</sub>O; \* 4) SO<sub>2</sub>.
537. CamoTvl il Tagan romel i naerTis ekval entobis ricxvia udidesi?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Mn<sub>3</sub>O<sub>4</sub>; \* 3) NO; 4) SO<sub>2</sub>.
538. CamoTvl il Tagan romel i naerTis ekval entobis ricxvia udidesi?
- 1) Al<sub>2</sub>O<sub>3</sub>; 2) Mn<sub>3</sub>O<sub>4</sub>; 3) N<sub>2</sub>O<sub>5</sub>; \* 4) SO<sub>2</sub>.
539. qvemoT CamoTvl il Tagan romel i naerTis ekval entobis ricxvi emTxveva qrom(III)-is oqsidis ekval entobis ricxvs?
- 1) FeS<sub>2</sub>; 2) CrPO<sub>3</sub>; 3) NO<sub>2</sub>; 4) SO<sub>3</sub>. \*
540. CamoTvl il Tagan, romel gamxnel Si ixsneba pentani ukeT?
- 1) CH<sub>3</sub>COOH; 2) C<sub>6</sub>H<sub>5</sub>CHO; 3) C<sub>6</sub>H<sub>12</sub>; \* 4) H<sub>2</sub>O.
541. CamoTvl il Tagan, romel gamxnel Si ixsneba amiaki ukeT?
- 1) CH<sub>3</sub>COOH; \* 2) C<sub>6</sub>H<sub>5</sub>CH<sub>3</sub>; 3) C<sub>6</sub>H<sub>12</sub>; 4) PH<sub>3</sub>.
542. CamoTvl il Tagan, romel gamxnel Si ixsneba heqsani uaresad?
- 1) CH<sub>3</sub>COOH; \* 2) C<sub>6</sub>H<sub>5</sub>CH<sub>3</sub>; 3) C<sub>6</sub>H<sub>12</sub>; 4) PH<sub>3</sub>.
543. CamoTvl il Tagan, romel gamxnel Si ixsneba amiaki uaresad?
- 1) CH<sub>3</sub>COOH; 2) C<sub>6</sub>H<sub>5</sub>COOH; 3) C<sub>6</sub>H<sub>12</sub>; \* 4) H<sub>2</sub>O.
544. buferul i sistemebis komponentebi ar SeiZl eba iyos?
- 1) susti mJava da misi anioni;

- 2) susti fuZe da misi kationi;  
 3) susti fuZe da misi anioni; \*  
 4) amfol itebis ionebi an mol ekul ebi.
545. buferul i sistemebis komponentebi ar SeiZl eba iyos?  
 1) Zl ieri mJava da misi anioni; \*  
 2) susti mJava da misi anioni;  
 3) susti fuZe da misi kationi;  
 4) amfol itebis ionebi an mol ekul ebi.
546. protol izur reaqciebs ar miekuTvneba:  
 1) neutral izaciis reaqciebi;  
 2) el eqtronebis gadataniT mimdinare reaqciebi; \*  
 3) buferul sistemebSi mimdinare reaqciebi;  
 4) sol vol izis (hidrol izis) reaqciebi.
547. qvemoT CamoTvl il i buferul i sistemebidan organizmSi ar gvxxvdeba:  
 1) fosfaturi; 2) acetaturi; \*  
 3) cil ovani buferi; 4) hidrokarbonatul i.
548. romel i maxasiaTebi is mudmivobas uzrunvel yofs organizmSi buferul i xsnari:  
 1) osmosuri wnevis; B2) temperaturis;  
 3) hidrostatikuri wnevis; 4) pH-is.\*
549. mJava buferul i sistema ar aris:  
 1) acetaturi; 2) hidrokarbonatul i;  
 3) hidrofosfaturi; 4) amiakuri.\*
550. fuZe buferul i sistemaa:  
 1) hidrokarbonatul i; 2) hidrofosfaturi;  
 3) amiakuri; \* E 4) hemogl obinuri.
551. moyvanil i debul ebebidan romel ia araswori?  
 1) buferul i xsnari \_ es aris xsnari, romel ic Seicavs misi ganzavebisas an masze mcire raodenobiT Zl ieri mJavis an tutis damatebisas pH-is mudmivi mniSvnel obis SenarCunebis unaris mqone wonasworul protol itur sistemas;  
 2) protol ituri buferul i xsnaris komponenteb waroadgens el eqtronis donori (l uisis fuZe) da el eqtronis aqceptori (l uisis mJava); \*  
 3) fuZe buferul sistemebs uwodeben xsnarebs, roml ebic Seicavs sust fuZes (protonis aqceptori) da mis maril s Zl ier mJavasTan (protonis donori);  
 4) buferul i tevadoba ewodeba Zl ieri mJavis an Zl ieri tutis mol i-ekvival entebis ricxvs, romel ic unda daematos 1 l buferul xsnars, raTa misi pH erTi erTeul iT Seicval os.
552. buferul i tevadoba damokidebul ia:  
 1) xsnarSi komponentTa koncentraciaze; \*  
 2) xsnarSi komponentTa masaze;  
 3) xsnarSi komponentTa masur Tanafardobaze;  
 4) xsnarSi komponentTa mocul obaze.
553. sixl is SratSi Tanafardoba ( $\text{HCO}_3^-/\text{H}_2\text{CO}_3$ ) normaSi tol ia:  
 1) 20:1; \* 2) 1:20; 3) 4:1; 4) 1:4.

554. fosfaturi buferul i sistema ( $\text{HPO}_4^{2-}/\text{H}_2\text{PO}_4^-$ ) moqmedebs fiziol ogiur areebSi, romel TaTvisac:

1)  $\text{pH} < 6$ ; 2)  $\text{pH} > 9$ ; 3)  $\text{pH} = 9,3-11,3$ ; 4)  $\text{pH} = 6,2-8,2$ .\*

555. hidrokarbonatul i buferul i sistema ( $\text{HCO}_3^-/\text{H}_2\text{CO}_3$ ) moqmedebs fiziol ogiur areebSi, romel TaTvisac:

1)  $\text{pH} = 8,2-10,2$ ; 2)  $\text{pH} = 5,4-7,4$ .\* 3)  $\text{pH} = 9,3-11,3$ ; 4)  $\text{pH} = 6,2-8,2$ .

556. buferul i tevadoba miT didia:

1) rac metia komponentTa masebi;

2) rac nakl ebia komponentTa koncentracia;

3) komponentebis koncentraciaTa fardoba rac ufro axl osaa erTTan; \*

4) komponentebis koncentraciaTa fardoba rac ufro gansxvavebul ia erTisagan.

557. buferul i xsnaris ganzavebisas:

1) buferul i tevadoba ar icvl eba; 2) buferul i tevadoba mcirdeba;\*

3)  $\text{pH}$  mcirdeba; 4)  $\text{pH}$  izrdeba.

558. fosfatur buferul sistemaSi ( $\text{H}_2\text{PO}_4^-/\text{HPO}_4^{2-}$ ) dihidrofosfat-ioni:

1) protonis donoria;\*

2) protonis aqceptorია;

3) mJangavia; 4) aRmdgenia.

559. fosfatur buferul sistemaSi ( $\text{H}_2\text{PO}_4^-/\text{HPO}_4^{2-}$ ) hidrofosfat-ioni:

1) protonis donoria; 2) protonis aqceptorია;\*

3) mJangavia; 4) aRmdgenia.

560. hidrokarbonatul buferul sistemaSi ( $\text{HCO}_3^-/\text{H}_2\text{CO}_3$ ) hidrokarbonat-ioni:

1) protonis donoria; 2) protonis aqceptorია;\*

3) mJangavia; 4) aRmdgenia.

561. hidrokarbonatul buferul sistemaSi ( $\text{HCO}_3^-/\text{H}_2\text{CO}_3$ ) naxSi rmJava:

1) protonis donoria;\*

2) protonis aqceptorია;

3) mJangavia; 4) aRmdgenia.

562. fuZe-mJavuri wonasworobis regul ireba organizmSi ar xdeba:

1) Jangva-aRdgeniT i reaqciebiT;\*

2) buferul i sistemebiT;

3) Tirkmel ebis saSual ebiT; 4) fil tvebis saSual ebiT.

563. ra sididis gamoTvl aris SeuZl ebel i Hhenderson-hasel baxis gantol ebis safuZvel ze?

1) nebismieri mJavas  $\text{pK}_a$  an fuZis  $\text{pK}_b$ ; 2) xsnaris  $\text{pH}$ ;

3) komponentebis Tanafardoba; 4) buferul i tevadoba.\*

564. rogorc mJangavi, ise aRmdgeni SeiZl eba iyos:

1) Mn; 2)  $\text{TiCl}_4$ ; 3)  $\text{H}_2\text{O}_2$ ; \* 4)  $\text{H}_2\text{CrO}_4$ .

565. rogorc mJangavi, ise aRmdgeni SeiZl eba iyos:

1) Zn; 2)  $\text{FeSO}_4$ ; \* 3)  $\text{NH}_3$ ; 4)  $\text{HNO}_3$ .

566. aRmdgeni ar SeiZl eba iyos:

1)  $\text{F}_2$ ; \* 2)  $\text{NH}_3$ ; 3)  $\text{MnSO}_4$ ; 4)  $\text{H}_2\text{O}_2$ .

567. kal iumis permanganatSi ( $\text{KMnO}_4$ ) manganumis Jangvis xarixia:

1) +5; 2) +6; 3) +7; \* 4) +8.

568. kal iumis manganatSi ( $\text{K}_2\text{MnO}_4$ ) manganumis Jangvis xarixia:

1) +5; 2) +6; \* 3) +7; 4) +8.

569. kal iumis diqromatSi ( $K_2Cr_2O_7$ ) qromis Jangvis xarisxia:

1) +5; 2) +6;\* 3) +7; 4) +8.

570. kal iumis qromatSi ( $K_2CrO_4$ ) qromis Jangvis xarisxia:

1) +5; 2) +6;\* 3) +7; 4) +8.

571. reaqcia  $Cl_2 + H_2O \rightarrow HCl + HClO$  aris:

- 1) Sigamol ekul uri Jangva-aRdgenis;
- 2) mol ekul aTSorisi Jangva-aRdgenis;
- 3) disproporciis;\*
- 4) es reaqcia ar aris Jangva-aRdgenis.

572. reaqcia  $2P_2O_3 + 6H_2O \rightarrow PH_3 + 3H_3PO_4$  aris:

- 1) Sigamol ekul uri Jangva-aRdgenis;
- 2) mol ekul aTSorisi Jangva-aRdgenis;
- 3) disproporciis; \*
- 4) es reaqcia ar aris Jangva-aRdgenis.

573. reaqcia  $NH_4NO_2 \rightarrow N_2 + 2H_2O$  aris:

- 1) Sigamol ekul uri Jangva-aRdgenis;\*
- 2) mol ekul aTSorisi Jangva-aRdgenis;
- 3) disproporciis;
- 4) es reaqcia ar aris Jangva-aRdgenis.

574. ganvixil oT reaqciebi: (i)  $Cl_2 + KOH \rightarrow KCl + KClO + H_2O$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania disproporciis reaqcia?

1) i \* 2) ii 3) iii 4) arcerTi

575. ganvixil oT reaqciebi: (i)  $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania disproporciis reaqcia?

1) i 2) ii 3) iii 4) arcerTi \*

576. ganvixil oT reaqciebi: (i)  $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania Sigamol ekul uri Jangva-aRdgenis reaqcia?

1) i 2) i da iii \* 3) ii da iii 4) iii

577. ganvixil oT reaqciebi: (i)  $Cl_2 + KOH \rightarrow KCl + KClO + H_2O$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania mol ekul aTSorisi Jangva-aRdgenis reaqcia?

1) i 2) ii \* 3) iii 4) arcerTi

578. ganvixil oT reaqciebi: (i)  $Cl_2 + KOH \rightarrow KCl + KClO + H_2O$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania Sigamol ekul uri Jangva-aRdgenis reaqcia?

1) i 2) ii 3) iii \* 4) arcerTi

579. ganvixil oT reaqciebi: (i)  $Cl_2 + KOH \rightarrow KCl + KClO + H_2O$ ; (ii)  $4NH_3 + 7O_2 \rightarrow 4NO_2 + 6H_2O$ ; (iii)  $NH_4NO_3 \rightarrow N_2O + 2H_2O$ . romel i maTgania mol ekul aTSorisi Jangva-aRdgenis reaqcia?

1) i 2) ii \* 3) iii 4) arcerTi

580. ganvixil oT reaqciebi: (i)  $NH_4NO_3 \rightarrow NH_3 + HNO_3$ ; (ii)  $2SO_2 + O_2 \rightarrow 2SO_3$ ; (iii)  $2KClO_3 \rightarrow 2KCl + 3O_2$ . romel i maTgania disproporciis reaqcia?

1) i 2) ii 3) iii 4) arcerTi \*

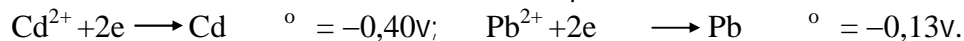
581. el eqtrul i potencial i ar SeiZl eba iyos:

1) Jangva-aRdgeni Ti; 2) membranul i;

3) fuZe-mJavuri;\* 4) el eqtrodul i.

582. daadgineT, romel i mimaTul ebiT warimarTeba reaqcia:

$\text{CdCl}_2 + \text{Pb} \rightleftharpoons \text{PbCl}_2 + \text{Cd}$  standartul pirobebSi, Tu:



1) marj vniv; 2) arc erTi mimaTul ebiT;

3) marcxniv;\* 4) damokidebul ia koncentraciaze.

583. daadgineT, romel i mimaTul ebiT warimarTeba reaqcia:

$2\text{Fe}(\text{NO}_3)_3 + 2\text{KCl} \rightleftharpoons 2\text{Fe}(\text{NO}_3)_2 + \text{Cl}_2 + 2\text{KNO}_3$  standartul pirobebSi, Tu:



1) marj vniv; 2) arc erTi mimaTul ebiT;

3) marcxniv; \* 4) damokidebul ia koncentraciaze.

584. romel produqtebamde SeiZi eba wyal i daiJangos?

1)  $\text{OH}^- + \text{H}_2$ ; 2)  $\text{O}_2 + \text{H}^+$ ;\* 3)  $2\text{OH}^-$ ; 4)  $\text{O}_2 + \text{H}_2$

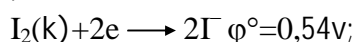
585. rac ufro metia oqsred-potencial is mniSvnel oba, miT ufro:

1) Zi ieria mJangavi;\* 2) sustia mJangavi;

3) Zi ieria mJangavis SeuRI ebul i aRmdgeni.

4) mdgradia sistema.

586. romel nivTierebasTan: NaI, NaBr Seva reaqciaSi rkina(III)-is sul fati wyal xsnarSi, Tu:  $\text{Fe}^{3+} + e \rightarrow \text{Fe}^{2+} \quad \varphi^\circ = 0,77\text{v};$

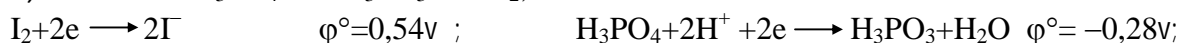


1) NaI;\* 2) NaBr; 3) arc erTTan; D4) orivesTan;

587. daadgineT qvemoT moyvanil i reaqciebis mimdinareobis mimaTul eba:

a)  $\text{H}_3\text{PO}_4 + 2\text{HI} \rightleftharpoons \text{H}_3\text{PO}_3 + \text{I}_2 + \text{H}_2\text{O}$

b)  $2\text{HCl} + \text{Sn} + \text{H}_3\text{PO}_4 \rightleftharpoons \text{H}_3\text{PO}_3 + \text{SnCl}_2$ , Tu:



1) a) reaqcia mimdinareobs marcxnidan marj vniv, b) reaqcia \_ marj vni dan marcxniv;

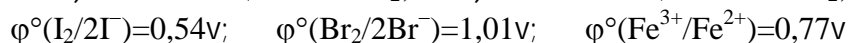
2) a) reaqcia mimdinareobs marj vni dan marcxniv, b) reaqcia \_ marcxnidan marj vniv;

3) orive reaqcia mimdinareobs marcxnidan marj vniv;

4) orive reaqcia mimdinareobs marj vni dan marcxniv.\*

588. daadgineT qvemoT moyvanil i reaqciebis mimdinareobis mimaTul eba:

a)  $2\text{Fe}^{3+} + 2\text{I}^- \rightleftharpoons 2\text{Fe}^{2+} + \text{I}_2$ ; b)  $2\text{Fe}^{3+} + 2\text{Br}^- \rightleftharpoons 2\text{Fe}^{2+} + \text{Br}_2$ , Tu:



1) a) reaqcia mimdinareobs marcxnidan marj vniv, b) reaqcia - marj vni dan marcxniv;\*

2) a) reaqcia mimdinareobs marj vni dan marcxniv, b) reaqcia \_ marcxnidan marj vniv;

3) orive reaqcia mimdinareobs marcxnidan marj vniv;

4) orive reaqcia mimdinareobs marj vni dan marcxniv.

589. standartul pirobebSi temperatura:

1) 273 K; 2) 288 K; 3) 298 K;\* 4) 300 K.

590. რომელი მათგანია სილიკატი გვხვდება მინის ელექტროდის მინის შემადგენლობაში?
- 1) Zn;
  - 2) Na; \*
  - 3) Al;
  - 4) Fe.
591. რომელი მათგანია სხვადასხვა მინის ელექტროდის ბურთულა?
- 1)  $H_2SO_4$ ;
  - 2) HCl;\*
  - 3)  $H_3PO_4$ ;
  - 4)  $HNO_3$ .
592. სითხის ზედპირული დაწმენვის ობიექტის დამოკიდებულება:
- 1) ტემპერატურაზე;
  - 2) გამყოფი ზედპირის ბუნებაზე;
  - 3) გახსნილი ნივთიერების კონცენტრაციაზე;
  - 4) ზედპირის ფართობზე.\*
593. ჰეტეროგენური სისტემა თავისი ენერჯის შემცირებას აწვევს:
- 1) გამყოფი ზედპირის ფართობის შემცირებით ან ზედპირული დაწმენვის ობიექტის გაწმენდა;
  - 2) გამყოფი ზედპირის ფართობის გაწმენდა ან ზედპირული დაწმენვის შემცირებით;
  - 3) გამყოფი ზედპირის ფართობის გაწმენდა ან ზედპირული დაწმენვის გაწმენდა;
  - 4) გამყოფი ზედპირის ფართობის შემცირებით ან ზედპირული დაწმენვის შემცირებით.\*
594. ზედპირული ადაქტიური ნივთიერებები გამოსწორის ზედპირული დაწმენვის ობიექტის:
- 1) ამცირებს;\*
  - 2) ზრდის;
  - 3) არ ცვლის;
  - 4) ზრდის ან ამცირებს სხვადასხვა ფაქტორებზე დამოკიდებულებით.
595. ზედპირული ადაქტიური ნივთიერებები გამოსწორის ზედპირული დაწმენვის ობიექტის:
- 1) ამცირებს;
  - 2) არ ცვლის;\*
  - 3) არ ცვლის ან ამცირებს;
  - 4) ზრდის ან ამცირებს სხვადასხვა ფაქტორებზე დამოკიდებულებით.
596. ზედპირული ადაქტიური ნივთიერებები გამოსწორის ზედპირული დაწმენვის ობიექტის:
- 1) ამცირებს;
  - 2) არ ცვლის;
  - 3) ზრდის;\*
  - 4) ზრდის ან ამცირებს სხვადასხვა ფაქტორებზე დამოკიდებულებით.
597. ზედპირული ადაქტიური ნივთიერებებია:
- 1) არაორგანული მათგანია მარილები;
  - 2) კარბონმატები;\*
  - 3) არაორგანული ფუზები;
  - 4) არაორგანული მათგანია
598. ზედპირული ადაქტიური ნივთიერებებია:
- 1) ცილები;
  - 2) ფოსფორიპიდები;
  - 3) ცხიმოვანი მათგანია;
  - 4) არაორგანული მათგანია.\*
599. ზედპირული ადაქტიური ნივთიერებებია:
- 1) ამინები;
  - 2) ნაქსირული ები;\*
  - 3) სპირტები;
  - 4) ცხიმოვანი მათგანია მარილები.
600. მოყვანილი დებულებიდან რომელია არასწორი?
- 1) ალიფატური მათგანია ზედპირული ადაქტიურობა ნაქსირული ბადოვანი ჯალვის ერთი  $CH_2$ -ის ჯგუფით გაწმენდას 3-3,5-ჯერ იზრდება;
  - 2) ალიფატური მათგანია ადსორბცია მარალი კონცენტრაციებისა აწვევს ზრდის მნიშვნელობას;
  - 3) მყარ ადსორბენტებზე უპირატესად ადსორბირდება ის აირები, რომლებიც უფრო ზნელად კონდენსირდება სითხეებში;\*
  - 4) ტემპერატურის გაწმენდას ფიზიკური ადსორბცია მცირდება.

601. Tu sorbcicul i procesi iwyeba fazaTa gamyof zedapirze, ris Semdeg xdeba sorbatis mol ekul ebis Tavistavadi difuzia sorbentis mTel mocul obaSi, process ewodeba:

- 1) qemosorbacia;
- 2) zedapirul i sorbcia;
- 3) absorbacia;\*      4) adsorbacia.

602. Tu sorbcicul process Tan axl avs sorbatis mol ekul ebis koncentraciis Tavistavadi Secvl a fazaTa gamyof sazRvarze, process ewodeba:

- 1) mocul obiTi sorbcia;
- 2) qemosorbacia;
- 3) absorbacia;
- 4) adsorbacia.\*

603.  $\frac{\Delta\sigma}{\Delta c}$  gamosaxul ebas uwodeben:

- 1) zedapirul daWimul obas;
- 2) zedapirul energias;
- 3) zedapirul aqtivobas;\*
- 4) zedapirul adsorbacias.

604. Tu gibsis adsorbciis izoTermis gantol ebaSi  $\frac{\Delta\sigma}{\Delta c} < 0$ , maSin:

- 1) adsorbacia dadebiTia; \*
- 2) adgil i aqvs qemosorbacias;
- 3) adsorbacia uaryofiTia;
- 4) adgil i aqvs absorbacias.

605. Tu gibsis adsorbciis izoTermis gantol ebaSi  $\frac{\Delta\sigma}{\Delta c} > 0$ , maSin:

- 1) adsorbacia dadebiTia;
- 2) adgil i aqvs qemosorbacias;
- 3) adsorbacia uaryofiTia;\*
- 4) adsorbacia ar xorciel deba.

606. fizikuri adsorbciisaTvis damaxasiaTebel i ar aris:

- 1) Seqcevadoba;
- 2) specifikuroba;\*
- 3) egzoTermul oba;
- 4) adsorbentis adsorbatTan mol ekul aTSorisi urTierTqmedeba.

607. qemosorbacia xasiaTdeba:

- 1) l okal izebiT;\*
- 2) araspecificurobiT;
- 3) SeqcevadobiT;
- 4) adsorbentis adsorbatTan mol ekul aTSorisi urTierTqmedebiT.

608. adsorbacia damokidebul i ar aris:

- 1) temperaturaze;
- 2) adsorbentisa da adsorbatis bunebaze;
- 3) adsorbentis xvedriT zedapirze;
- 4) koncentraciaze, zRvrul i adsorbciis miRwevis Semdeg.\*

609. moyvanil i debul ebebidan romel ia araswori?

- 1) adsorbacia aris gaxsnili nivTierebis koncentraciis cvl il eba mSTanmTqmel is zedapirul fenaSi mocul obiT fazasTan SedarebiT;
- 2) adsorbacia SeiZl eba iyos rogorc dadebiTi, ise uaryofiTi;
- 3) adsorbacia Tavistavad mimdinare procesia;
- 4) nivTierebas, romel ic STanTqmul ia heterogenur fazaSi, sorbenti ewodeba.\*

610. adsorbacias myar adsorbentze raodenobrivad axasiaTeben xvedriTi adsorbciis sididiT, romel ic tol ia:

- 1) adsorbatis masisa adsorbentis erTeul masaze;
- 2) adsorbatis mocul obisa adsorbentis erTeul masaze;
- 3) adsorbatis raodenobisa adsorbentis erTeul masaze;\*
- 4) adsorbatis masisa adsorbentis erTeul mocul obaze.

611. gibsis adsorbciis izoTermis gantol ebaa:



$$1) A = A_{\max} \frac{Kc}{Kc + 1}; \quad 2) A = -\frac{c}{RT} \frac{d\sigma}{dc}; \quad *$$

$$3) AA = -\frac{RT}{c} \frac{d\sigma}{dc}; \quad 4) A = -\frac{c}{RT} \frac{dc}{d\sigma}$$

612. I engmiuris adsorbciis izoTermis gantol ebaa:

$$1) A = A_{\max} \frac{Kc}{Kc + 1}; \quad 2) A = \frac{x}{m} = Kc^n;$$

$$1) A = \frac{x}{m} = Kp^n; \quad 4) A = A_{\max} \frac{Kc + 1}{Kc}.$$

613. freindl ixis adsorbciis izoTermis gantol eba ar aris:

$$1) A = \frac{x}{m} = Km^n; \quad 2) A = \frac{x}{m} = Kc^n;$$

$$3) A = \frac{x}{m} = Kp^n; \quad 4) \lg A = \lg K + n \lg c.$$

614. freindl ixis adsorbciis izoTerma karg SesabamisobaSia eqsperimentul monacemebTan, roml ebic miRebul ia:

1) dabal i wnevebis pirobepSi; 2) nebismeri wnevebis pirobepSi;

3) maRal i wnevebis pirobepSi; 4) mudmivi wnevis pirobepSi.

615. I engmiuris adsorbciis izoTerma karg SesabamisobaSia eqsperimentul monacemebTan:

1) dabal i wnevebis pirobepSi; 2) nebismeri wnevebis pirobepSi;

3) saSual o wnevebis pirobepSi; 4) mudmivi wnevis pirobepSi.

616. panet-faiansis wesis Tanaxmad, myar adsorbentze upiratesad adsorbirdeba:

1) anionebi; 2) kationebi; 3) nebismeri ioni;

4) adsorbentis kristal ur strukturaSi arsebul i da maTi izomorful i ionebi.\*

617. qvemoT moyvanil romel rigSia ionebi ganl agebul i adsorbciis unaris Semcirebis mi marTul ebiT?

1) Th<sup>4+</sup>; Mg<sup>2+</sup>; Fe<sup>3+</sup>; K<sup>+</sup>; 2) Th<sup>4+</sup>; K<sup>+</sup>; Ca<sup>2+</sup>; Fe<sup>3+</sup>;

3) Th<sup>4+</sup>; Fe<sup>3+</sup>; Mg<sup>2+</sup>; Na<sup>+</sup>; 4) Ca<sup>2+</sup>; K<sup>+</sup>; Th<sup>4+</sup>; Fe<sup>3+</sup>.

618. erTmuxtiani ionebis SemTxvevaSi adsorbciul i unari miT metia:

1) rac ufro nakl ebia ionis radiusi;

2) rac ufro nakl ebia sol vatirebul i ionis radiusi;\*

3) rac maRal ia mapol arizebel i unari;

4) rac metia ionis hidrataciis xarisxi.

619. radgan airebis adsorbacia myar sxeul ebze egzoTermul ia, temperaturis gazrdisas fizikuri adsorbacia:

1) izrdeba; 2) mcirdeba; 3) j er izrdeba, Semdeg ki mcirdeba;

4) ar icvl eba.

620. ras warmoadgens monomol ekul uri Sre, rogorc faza?

1) uxeSdispersiul sistemas; 2) homogenur sistemas;

3) mikroheterogenul sistemas; \* 4) ul tramikroheterogenul sistemas.

621. ra mimarTebaSia fazaTa gamyofi zedapiri im fazebTan, roml ebsac igi hyofs?

1) odnav gansxvavdeba erT-erTisagan, mkveTrad – meorisagan;

2) mkveTrad gansxvavdeba orivesagan; \*

3) odnav gansxvavdeba orivesagan;

4) arcerTisagan gansxvavdeba.

622. ra icl eba fazis zomebis SemcirebiT?

1) j amuri masa; 2) j amuri mocul oba; 3) j amuri simkvrive; 4) zedapiris farTobi. \*

623. ra efeqti gaaCnia xvedriTi zedapiris gazrdas gamyofi zedapiris gavl enaze sistemis Tvissebebze?

1) sustdeba; 2) Zl ierdeba; \* 3) ar icvl eba; 4) j er sustdeba, mere izrdeba.

624. rogor icvl eba zedapirul i daWimul oba temperaturis matebasTan erTad?

1) 1) sustdeba; \* 2) Zl ierdeba; 3) ar icvl eba; 4) j er sustdeba, mere izrdeba.

625. ratom Rebul obs siTxis wveTi sferosebr formas?

1) tol i mocul obebisas sferos zedapiris farTobi maqsimal uria;

2) tol i mocul obebisas sferos zedapiris farTobi minimal uria; \*

3) sistemis stabil uroba izrdeba zedapirul i daWimul obis zrdasTan erTad;

4) sferul zedapirze airis wneva umni Svel oa.

626. wyal baduri bmis formirebiT mimdinare sorbciul i procesi warmoadgens

1) qemosorbciias; 2) fizikur adsorbciias; \* 3) hidrosorbciias; 4) akvasorbciias.

627. -400-dan -40 kj /mol amde energiis mqone bmis formirebiT mimdinare sorbciul i procesi warmoadgens

1) qemosorbacias; \* 2) fizikur adsorbacias; 3) zesorbacias; 4) es araa sorbcia.

628. qvemoT CamoTvl il Tagan romel ia hidrofili uri sorbenti?

1) sil ikagel i; \* 2) gaaqtivebul i naxSiri; 3) Tal ki; 4) fToropl asti.

629. qvemoT CamoTvl il Tagan romel i araa hidrofili uri sorbenti?

1) sil ikagel i; 2) gaaqtivebul i naxSiri; \* 3) Tixa; 4) ceol iTebi.

630. qvemoT CamoTvl il Tagan romel i araa hidrofili uri sorbenti?

1) al umogel i; 2) ceol iTebi; 3) Tal ki; \* 4) sil ikagel i.

631. qvemoT CamoTvl il Tagan romel i araa hidrofili uri sorbenti?

1) sil ikagel i; 2) ceol iTebi; 3) al umogel i; 4) fToropl asti. \*

632. sxva erTnair pirobebSi, ra maxasiaTebi is mqone airebi adsorbirdeba ufro iol ad?

1) advil ad kondensirebadi; \* 2) Znel ad kondensirebadi; 3) pol arul i mol ekul is mqone; 4) arapol arul i mol ekul is mqone.

633. ra ewodeba viwro forebSi STanTqmuli airis gadasvl as Txevad mdgomareobaSi?

1) forovani absorbcia; 2) kapil arul i kristalizacia; 3) kapil arul i forezi; 4) kapil arul i kondensacia. \*

634. ra ewodeba gamxsnel is zedapirul i daWimul obis Secvl is unars?

1) zedapirul i aqtiuroba; \* 2) dasvel eba; 3) emul gireba; 4) gaSroba.

635. sad ufro ukeT adsorbirdeba mciredpol arul gamxsnel Si arsebul i pol arul i adsorbntivi?

1) pol arul adsorbntze; \* 2) arapol arul adsorbntze; 3) Tanabrad kargad adsorbirdeba, adsorbntis tipis miuxedavad; 4) Tanabrad cudad adsorbirdeba, adsorbntis tipis miuxedavad;

636. sad ufro ukeT adsorbirdeba pol arul gamxsnel Si arsebul i arapol arul i adsorbntivi?

1) pol arul adsorbntze; 2) arapol arul adsorbntze; \* 3) Tanabrad kargad adsorbirdeba, adsorbntis tipis miuxedavad; 4) Tanabrad cudad adsorbirdeba, adsorbntis tipis miuxedavad;

637. ris xarj ze xorciel deba arapol arul i da mciredpol arul i qsenobiotikebis mocil eba organizmidan?

1) qsenobiotikebi, aRdgenis Sedegad, kargaven pol arul j gufs da iol ad wydebian l ipids.

2) qsenobiotikebi toqsikuroba iwvevs temperaturis matebas, ris Sedegadac maTi xsnadoba mkveTrad matul obs;

3) qsonobiotikebi organizms scil deba iseTi preparatis setanis Semdeg, razec isini ukeT adsorbirdeba;

4) qsenobiotikebs, Jangvis Sedegad, uCndeba pol arul i fragmenti, ris Sedegadac maTi xsnadoba wyl ian fazaSi izrdeba. \*

638. rogor adsorbirdeba arael eqtrol itebi?

1) anionebis saxiT; 2) kationebis saxiT; 3) anionebisa da kationebis Tanabari raodenobiT; 4) mol ekul ebis saxiT.\*

639. ratom aris rTul i myari adsorbentebis mier gaxsnil i nivTierebebis adsorbacia yvel aze rTul i sorbciul i procesi?

1) sistemis heterogenul obis gamo; 2) procesSi gamxsnel is mol ekul ebis monawil eobis gamo; \* 3) sakuTriv adsorbentis gaxsnis gamo; 4) gamol eqvis dawyebis gamo.

640. zogadad, rogor icvl eba adsorbacia temperaturis matebasTan erTad?

1) izrdeba; 2) mcirdeba; \* 3) ar icvl eba; 4) j er izrdeba, Semdeg mcirdeba.

641. ras warmoadgens ionTa l iotropiul i rigi?

1) ionTa ganl agebas xsnadobis mixedviT; 2) ionTa ganl agebas wyal badis Canacvl ebis unaris mixedviT; 3) ionTa ganl agebas gamol eqvis siiol is mixedviT; 4) ionTa ganl agebas adsorbciis unaris mixedviT.\*

642. romel ions gaaCnia ukeTesi adsorbciul i unari, Tu ar gaviTval iswinebT maT radiuss sol vatirebul mdgomareobaSi?

1)  $Al^{3+}$ ; \* 2)  $Fe^{2+}$ ; 3)  $Mg^{2+}$ ; 4)  $K^+$ .

643. romel ions gaaCnia uaresi adsorbciul i unari, Tu ar gaviTval iswinebT maT radiuss sol vatirebul mdgomareobaSi?

1)  $Al^{3+}$ ; 2)  $Fe^{2+}$ ; 3)  $Mg^{2+}$ ; 4)  $K^+$ . \*

644. erTnairmuxtian ionebs miT uaresi adsorbciul i unari gaaCnia, rac

- 1) mcirea maTi radiusi sol vatirebul mdgomareobaSi;
- 2) didia maTi radiusi sol vatirebul mdgomareobaSi; \*
- 3) mcirea maTi radiusi arasol vatirebul mdgomareobaSi;
- 4) didia maTi radiusi arasol vatirebul mdgomareobaSi.

645. I ioofil ur sistemebis ar axasiaTebis:

- 1) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;
- 2) Termodinamikuri aramdgradoba;\*
- 3) TviTdispergirebis unari;
- 4) dispersiul i fazis nawil akebis maRal i swrafva gamxsnel is mol ekul ebisadmi.

646. I iofohuri sistemebisaTvis damaxasiaTebel ia:

- 1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris Zl ieri urTierTqmedeba;
- 2) dispersiul i fazis nawil akebis sol vataciis dabal i xarisxi;\*
- 3) Termodinamikuri mdgradoba;
- 4) TviTdispergirebis unari.

647. romel i piroba aris arasworad miTitebul i kol oiduri xsnaris misaRebad?

- 1) dispersiul i fazis cudi xsnadoba dispersiul areSi;
- 2) nawil akTa kol oiduri dawil adebis xarisxis miRweva ( $10^{-7}$ - $10^{-9}$  m);
- 3) stabil izardoris arseboba;
- 4) ori komponentis arseboba, roml ebic erTmaneTSi kargad ixsneba.\*

648. kol oiduri sistemebis miRebis qvemoT CamoTvl ili xerxebidan romel i miekuTvneba fizikuri kondensaciis meTods?

- 1) hidrol izi;
- 2) gamxsnel is Secvl is meTodi;\*
- 3) ul trabgeriTi meTodi;
- 4) adsorbciul i peptizacia.

649. sinaTI is gabnevis intensivoba tol ia:

$$1) I = I_0 k \frac{c_v r^6}{\lambda^4} \quad * \quad 2) I = I_0 k \frac{c_v r^3}{\lambda^4} \quad 3) I = I_0 k \frac{c_v r^6}{\lambda^2} \quad 4) I = I_0 k \frac{c_v \lambda^6}{r^4}$$

650. romel i ar miekuTvneba el eqtrokinetikur movl enebis:

- 1) el eqtroforezi;
- 2) gadinebis potencial i
- 3) el eqtroosmosi;
- 4) difuziur-sedimentaciuri wonasworoba;\*

651. dispersiul i fazis gadaadgil eba dispersiul i aris mimarT el eqtrul i denis moqmedebiT aris:

- 1) el eqtroforezi;\*
- 2) el eqtroosmosi;

652. dispersiul i aris gadaadgil ebas fazis mimarT, el eqtrul i denis moqmedebiT, ewodeba:

- 1) el eqtroforezi;
- 2) el eqtroosmosi;\*
- 3) sedimentaciis potencial i;
- 4) gadinebis potencial i

653. Rrubel Si:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;\*
- 2) dispersiul i faza airia, sadispersio are ki - siTxe;
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

654. kvaml Si:

- 1) dispersiul i faza myaria, sadispersio are ki – siTxe;
- 2) dispersiul i faza myaria, sadispersio are ki – airi;\*
- 3) dispersiul i faza, sadispersio are ki – myari;
- 4) dispersiul i faza siTxea, sadispersio are ki – airi.

655. kol oiduri nawil aki (granul a) ewodeba:

- 1) agregats; 2) micel as;
- 3) agregats adsorbciul SresTan erTad; \*
- 4) birTvsa da difuziur Sres.

656. micel uri Teoriis Tanaxmad, kol oidur nawil akze muxti warmoiqmneba:

- 1) nawil akis zedapirze ionebis SerCeviTi adsorbciit; \*
- 2) osmosuri wnevis gavl eniT;
- 3) myari fazis zedapiridan ionebis difuziit;
- 4) brounis moZraobiT.

657. ionuri stabilizatorebis Semcveli kol oiduri xsnarebi agregatul ad aramdgradebia, rodesac maTi micel ebis  $\xi$ -potencial ia:

- 1) 25 mv; \* 2) 35 mv; 3) 45 mv; 4) 55 mv.

658.  $\xi$ -potencial i ar aris:

- 1) el eqtruli potencial i el eqtrul vel Si moZraobis unaris mqone nawil aksa da garemomcvel siTxes Soris;
- 2) granul is potencial i;
- 3) potencial i adsorbciul da difuziur fenebs Soris;
- 4) maqsimal uri potencial Ta sxvaoba myar zedapirsa da yvel a antiions Soris. \*

659. el eqtrokinetikuri potencial i warmoiqmneba:

- 1) potencial ganmsazRvrel i ionisa da antiionis sazRvarze;
- 2) granul asa da difuziuri Sris sazRvarze; \*
- 3) micel isa da intermicel arul i aris sazRvarze;
- 4) agregatisa da adsorbciul i Sris sazRvarze.

660. CamoTvlili mosazrebebidan romelia araswori micel uri Teoriis Tanaxmad?

- 1) micel a Sedgeba granul asa da difuziuri Srisagan;
- 2) granul a Sedgeba birTvsa da antiionebis difuziuri Srisagan; \*
- 3) birTvi Sedgeba agregatisa da potencial ganmsazRvrel i ionebisagan;
- 4) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan.

661. BaSO<sub>4</sub>-is zolis micel as formula, Tu is miRebulia Na<sub>2</sub>SO<sub>4</sub>-ze BaCl<sub>2</sub>-is moqmedebiT, am ukanasknelis saWarbis pirobebSi, aris:

- 1)  $\{ [m(\text{BaSO}_4) n\text{Ba}^{2+} \cdot 2(n-x) \text{Cl}^-]^{2x+} \cdot 2x \text{Cl}^- \}$ ;\*
- 2)  $\{ [m(\text{BaSO}_4) 2n\text{Cl}^- \cdot (n-x) \text{Ba}^{2+}]^{2x-} \cdot x \text{Ba}^{2+} \}$ ;
- 3)  $\{ [m(\text{BaSO}_4) n\text{Ba}^{2+} \cdot (n-x) \text{SO}_4^{2-}]^{2x+} \cdot x \text{SO}_4^{2-} \}$ ;
- 4)  $\{ [m(\text{BaSO}_4) n\text{SO}_4^{2-} \cdot 2(n-x) \text{Na}^+]^{2x-} \cdot 2x \text{Na}^+ \}$ .

662. BaSO<sub>4</sub>-is zolis micel as formula, Tu is miRebulia Na<sub>2</sub>SO<sub>4</sub>-ze BaCl<sub>2</sub>-is moqmedebiT, natriumis sul fatis saWarbis pirobebSi, aris:

- 1)  $\{ [m(\text{BaSO}_4) n\text{Ba}^{2+} \cdot 2(n-x) \text{Cl}^-]^{2x+} \cdot 2x \text{Cl}^- \}$ ;
- 2)  $\{ [m(\text{BaSO}_4) 2n\text{Cl}^- \cdot (n-x) \text{Ba}^{2+}]^{2x-} \cdot x \text{Ba}^{2+} \}$ ;
- 3)  $\{ [m(\text{BaSO}_4) n\text{Ba}^{2+} \cdot (n-x) \text{SO}_4^{2-}]^{2x+} \cdot x \text{SO}_4^{2-} \}$ ;
- 4)  $\{ [m(\text{BaSO}_4) n\text{SO}_4^{2-} \cdot 2(n-x) \text{Na}^+]^{2x-} \cdot 2x \text{Na}^+ \}$ .\*

663. el eqtroforezi ar gamoiyeneba:

- 1) makromol ekul ebis narevis dayofisa da anal izisaTvis;
- 2) organizmSi samkurnal o preparatebis Sesayvanad;
- 3) dispersiul i sistemebis misaRebad; \*
- 4) diagnostikisa da daavadebebis mimdinareobis dasaxasiaTebi ad.

664. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:

- 1) gamsxvil ebis process;
- 2) SeerTebis process;
- 3) Sewebebis process;
- 4) gamol eqvis process. \*

665. ionTa makoagul irebel i unari damokidebul i ar aris:

- 1) ionis muxtze;
- 2) ionis hidrataciis xarisxe;
- 3)  $\xi$  (Zeta) potencial is sidideze;
- 4) osmosur wnevaze. \*

666. dispersiul i sistemebis umdgradobis faqtorია:

- 1) el eqtrul i muxtis arseboba dispersiul nawil akebze;
- 2)kol oiduri nawil akebis sol vataciis unari;
- 3) Warbi zedapirul i energia; \*
- 4) (Zeta) potencial is arseboba.

667. dadgenilia, rom natural uri lateqsis gl obul ebs aqvs uaryofiti el eqtrul i muxti. romel i el eqtrol itis moqmedeba aris maqsimal urad efeqturi lateqsidan kauCukis gamosayofad?

- 1)  $\text{Na}_2\text{SO}_4$ ;
- 2)  $\text{K}_4[\text{Fe}(\text{CN})_6]$ ;
- 3)  $\text{MgSO}_4$ ;
- 4)  $\text{Al}_2(\text{SO}_4)_3$ . \*

668. yvel a el eqtrol its SeuZl ia gamoiwvios liofoburi zol is koagul acia. makoagul irebel i unariT xasiaTdeba is ionebi, romel Ta muxti:

- 1) iseTivea, rogoric granul as muxti;
- 2) difuziuri Sris ionebis muxtis sapirispiroa;
- 3) potencial ganmsazRvrel i ionis muxtis niSnisaa;
- 4) granul as muxtis sapirispiroa. \*

669. mmn-is mier zol ebis koagul aciisagan dacvis unari raodenobrivad gamoisaxeba "oqros" ricxvit, romel ic tolia damcavi mmn-is mil igramebis minimal uri raodenobisa, romel ic 10 ml oqros zol sicavs koagul aciisagan masze xsnaris damatebisas:

- 1) 1 ml 10%-iani  $\text{NaCl}$ -is; \*
- 2) 10 ml 0,85%-iani  $\text{NaCl}$ -is;
- 3) 1 ml 0,9%-iani  $\text{CaCl}_2$ -is;
- 4) 10 ml 10%-iani  $\text{NaCl}$ -is.

670. eqsperimentul i monacemebi adastureben, rom SeCvevis dros zol is koagul acia xorciel deba el eqtrol iti-koagul antiS:

- 1) ufro dabal i koncentraciis dros, vidre koagul aciis zRurbl ia;
- 2) koagul aciis zRurbl is tol i koncentraciis dros;
- 3) ufro maRal i koncentraciis dros, vidre koagul aciis zRurbl ia; \*
- 4) SeCvevis dros zol is koagul acia ar xorciel deba.

671. koagul aciis zRurbl i drois garkveul monakveTSi koagul aciis dasawyebad saWiro el eqtrol itis is minimal uri raodenobaa (mol ebSi), romel ic unda daematos:

1) 1 ml zol s; 2) 100 ml zol s; 3) 100 g zol s; 4) 1000 ml zol s. \*

672. I iofil ur sistemebs ar axasiaTebS:

1) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

2) Termodinamikuri aramdgradoba; \*

3) TviTdispergi rebis unari;

4) dispersiul i fazis nawil akebis maRal i swrafva gamxsnel is mol ekul ebisadmi.

673. I iofil ur sistemebs axasiaTebS:

1) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi; \*

2) Termodinamikuri aramdgradoba;

3) maRal i zedapirul i daWimul oba;

4) dispersiul i fazis nawil akebis susti swrafva gamxsnel is mol ekul ebisadmi.

674. I iofil ur sistemebs ar axasiaTebS:

1) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

2) Termodinamikuri mdgradoba;

3) TviTdispergi rebis unari;

4) dispersiul i fazis nawil akebis susti swrafva gamxsnel is mol ekul ebisadmi. \*

675. I iofil ur sistemebs axasiaTebS:

1) dispersiul i fazis nawil akebis sol vataciis dabal i xarisxi;

2) Termodinamikuri aramdgradoba;

3) TviTdispergi rebis unari; \*

4) mcire zedapirul i daWimul oba.

676. I iofil ur sistemebs ar axasiaTebS:

1) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

2) Termodinamikuri mdgradoba;

3) warmoqmni procesis endoergul oba; \*

4) dispersiul i fazis nawil akebis maRal i swrafva gamxsnel is mol ekul ebisadmi.

677. I iofil ur sistemebs axasiaTebS:

1) midrekil eba dispersiul i fazis nawil akebis gamsxvil ebisadmi;

2) Termodinamikuri aramdgradoba;

3) warmoqmni procesis egzoergul oba; \*

4) daSl isadmi tendencia.

678. I iofoburi sistemebsaTvis damaxasiaTebel ia:

1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris Zl ieri urTierTqmedeba;

2) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

3) Termodinamikuri mdgradoba;

4) TviTdispergi rebis uunaroba. \*

679. I iofoburi sistemebsaTvis damaxasiaTebel ia:



1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris Zl ieri urTierTqmedeba;

2) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

3) Termodinamikuri aramdgradoba; \*

4) TviTdispergirebis unari.

680. I iofohuri sistemebisaTvis damaxasiaTebel ia:

1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris susti urTierTqmedeba;

2) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

3) Termodinamikuri mdgradoba;

4) daSI isadmi tendencia. \*

681. I iofohuri sistemebisaTvis damaxasiaTebel i araa:

1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris Zl ieri urTierTqmedeba; \*

2) dispersiul i fazis nawil akebis sol vataciis dabal i xarisxi;

3) Termodinamikuri aramdgradoba;

4) zedapirul i Tavisufal i energiis siWarbe.

682. I iofohuri sistemebisaTvis damaxasiaTebel ia:

1) tendencia dispersiul i fazis nawil akebis gamsxvil ebisadmi; \*

2) dispersiul i fazis nawil akebis sol vataciis maRal i xarisxi;

3) Termodinamikuri mdgradoba;

4) TviTdispergirebis unari.

683. I iofohuri sistemebisaTvis damaxasiaTebel i araa:

1) dispersiul i fazis nawil akebsa da dispersiul i aris mol ekul ebs Soris susti urTierTqmedeba;

2) dispersiul i fazis nawil akebis sol vataciis dabal i xarisxi;

3) zedapirul i Tavisufal i energiis deficiiti; \*

4) TviTdispergirebis unari.

684. romel i piroba aris arasworad miTiTebul i kol oiduri xsnaris misaRebad?

1) dispersiul i fazis cudi xsnadoba dispersiul areSi;

2) nawil akTa kol oiduri dawil adebis xarisxis miRweva ( $10^{-3}$ - $10^{-4}$  m); \*

3) stabil izardoris arseboba;

4) ori komponentis arseboba, roml ebic erTmaneTSi cudad ixzneba.

685. romel i pirobaa sworad miTiTebul i kol oiduri xsnaris misaRebad?

1) dispersiul i fazis kargi xsnadoba dispersiul areSi;

2) nawil akTa kol oiduri dawil adebis xarisxis miRweva ( $10^{-7}$ - $10^{-9}$  m); \*

3) stabil izardoris ararboba;

4) ori komponentis arseboba, roml ebic erTmaneTSi kargad ixzneba.

686. romel i pirobaa sworad miTiTebul i kol oiduri xsnaris misaRebad?

1) dispersiul i fazis cudi xsnadoba dispersiul areSi; \*

2) nawil akTa kol oiduri dawil adebis xarisxis miRweva ( $10^{-3}$ - $10^{-5}$  m);

3) iniciatoris arseboba;

4) ori komponentis arseboba, roml ebic erTmaneTSi kargad ixzneba.

687. romel i pirobaa sworad miTiTebul i kol oiduri xsnaris misaRebad?

- 1) dispersiul i fazis kargi xsnadoba dispersiul areSi;
  - 2) nawil akTa kol oiduri dawil adebis xarixsis miRweva ( $10^{-4}$ - $10^{-5}$  m);
  - 3) stabil izatoris arseboba; \*
  - 4) ori komponentis arseboba, roml ebic erTmaneTSi kargad ixzneba.
688. romel i piroba aris arasworad miTiTebul i kol oiduri xsnaris misaRebad?
- 1) dispersiul i fazis cudi xsnadoba dispersiul areSi;
  - 2) nawil akTa kol oiduri dawil adebis xarixsis miRweva ( $10^{-4}$ - $10^{-5}$  m); \*
  - 3) stabil izatoris arseboba;
  - 4) yvel a piroba sworadaa miTiTebul i.
689. romel i piroba aris arasworad miTiTebul i kol oiduri xsnaris misaRebad?
- 1) dispersiul i fazis cudi xsnadoba dispersiul areSi;
  - 2) nawil akTa kol oiduri dawil adebis xarixsis miRweva ( $10^{-7}$ - $10^{-9}$  m);
  - 3) stabil izatoris arseboba;
  - 4) yvel a piroba sworadaa miTiTebul i. \*
690. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan an movl enebidan romel i miekuTvneba fizikuri kondensaciis meTods?
- 1) hidrol izi; 2) Rrubl is warmoqmna;\*
  - 3) ul trabgeriT i meTodi; 4) adsorbciul i peptizacia.
691. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan romel i miekuTvneba qimiuri kondensaciis meTods?
- 1) hidrol izi; \* 2) gamxsnel is Secvl is meTodi;
  - 3) ul trabgeriT i meTodi; 4) vol tas rkal is Seqmna.
692. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan romel i ar miekuTvneba qimiuri kondensaciis meTods: (i) hidrol izi; (ii) gamxsnel is Secvl is meTodi; (iii) ul trabgeriT i meTodi; (iv) Jangva-aRdgenis meTodi?
- 1) mxol od i; 2) i da iv; 3) ii da iii; \* 4) i da ii.
693. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan romel i ar miekuTvneba fizikuri dispergirebis meTods?
- 1) hidrol izi; \* 2) vol tas rkal is Seqmna;
  - 3) ul trabgeriT i meTodi; 4) adsorbciul i peptizacia.
694. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan romel i miekuTvneba dispergirebis meTodebs: (i) hidrol izi; (ii) gamxsnel is Secvl is meTodi; (iii) meqanikuri daqcumaceba; (iv) adsorbciul i peptizacia?
- 1) ii da iii; 2) iii da iv; \* 3) i da ii; 4) i da iv.
695. kol oiduri sistemebis miRebis qvemoT CamoTvl il i xerxebidan romel i ar miekuTvneba dispergirebis meTodebs?
- 1) vol tas rkal is meTodi; 2) gamxsnel is Secvl is meTodi; \*
  - 3) ul trabgeriT i meTodi; 4) adsorbciul i peptizacia.
696. bunebriv wyl ebSi:
- 1) dispersiul i faza siTxea, sadispersio are ki – airi;
  - 2) dispersiul i faza myaria, sadispersio are ki – siTxe;\*
  - 3) rogorc dispersiul i faza, ise sadispersio are airia;
  - 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

697. gafrqveul qimikatebSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi; \*
- 2) dispersiul i faza airia, sadispersio are ki - siTxe;
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

698. mtverSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;
- 2) dispersiul i faza myaria, sadispersio are ki - airi; \*
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are myaria.

699. sapis qafSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;
- 2) dispersiul i faza airia, sadispersio are ki - siTxe; \*
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

700. rZeSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;
- 2) dispersiul i faza airia, sadispersio are ki - siTxe;
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea. \*

701. pemzaSi:

- 1) dispersiul i faza airia, sadispersio are ki - myari; \*
- 2) dispersiul i faza myaria, sadispersio are ki - airi;
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

702. Jel atinSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;
- 2) dispersiul i faza airia, sadispersio are ki - siTxe;
- 3) dispersiul i faza siTxea, sadispersio are ki - myari; \*
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

703. saRebrebSi:

- 1) dispersiul i faza siTxea, sadispersio are ki - airi;
- 2) dispersiul i faza myaria, sadispersio are ki - siTxe; \*
- 3) rogorc dispersiul i faza, ise sadispersio are airia;
- 4) rogorc dispersiul i faza, ise sadispersio are siTxea.

704. CamoTvl il i mosazrebebidan romel ia araswori micel uri Teoriis Tanaxmad?

- 1) micel a Sedgeba granul asa da difuziuri Srisagan;
- 2) granul a Sedgeba birTvisa da antiionebis difuziuri Srisagan; \*
- 3) birTvi Sedgeba agregatisa da potencial ganmsazRvrel i ionebisagan;
- 4) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan.

705. CamoTvl il i mosazrebebidan romel ia araswori micel uri Teoriis Tanaxmad?

- 1) micel a Sedgeba granul asa da difuziuri Srisagan;

- 2) granul a Sedgeba agregatisa da adsorbciul i Srisagan;
- 3) birTvi Sedgeba agregatisa da potencial ganmsazRvrel i ionebisagan;
- 4) adsorbciul i Sre Sedgeba mxol od potencial ganmsazRvrel i ionebisagan. \*
706. CamoTvl il i mosazrebebidan romel ia swori micel uri Teoriis Tanaxmad?
- 1) granul a Sedgeba micel isa da difuziuri Srisagan;
- 2) granul a Sedgeba birTvisa da antiionebis difuziuri Srisagan;
- 3) birTvi Sedgeba difuziuri Srisa da potencial ganmsazRvrel i ionebisagan;
- 4) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan. \*
707. CamoTvl il i mosazrebebidan romel ia araswori micel uri Teoriis Tanaxmad?
- 1) micel a Sedgeba granul asa da difuziuri Srisagan;
- 2) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan;
- 3) birTvi Sedgeba agregatisa da antiionebis adsorbciul i Srisagan; \*
- 4) birTvi Sedgeba agregatisa da potencial ganmsazRvrel i ionebisagan.
708. CamoTvl il i mosazrebebidan romel ia araswori micel uri Teoriis Tanaxmad?
- 1) micel a Sedgeba granul asa da difuziuri Srisagan;
- 2) granul a Sedgeba birTvisa da adsorbciul i Srisagan;
- 3) birTvi Sedgeba granul isa da potencial ganmsazRvrel i ionebisagan; \*
- 4) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan.
709. CamoTvl il i mosazrebebidan romel ia swori micel uri Teoriis Tanaxmad?
- 1) micel a Sedgeba granul asa da adsorbciul i Srisagan;
- 2) granul a Sedgeba birTvisa da antiionebis difuziuri Srisagan;
- 3) birTvi Sedgeba agregatisa da antiionebisagan;
- 4) adsorbciul i fena Sedgeba potencial ganmsazRvrel i ionebisagan da antiionebisagan. \*
710. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:
- 1) gamsxvil ebis process ;      2) gamol eqvis process; \*
- 3) Sewebebis process;      4) Sewebebis process.
711. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:
- 1) gamsxvil ebis process; \*      2) gamyarebis process;
- 3) disperebis process;      4) gamol eqvis process.
712. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:
- 1) gamsxvil ebis process;      2) sol vataciis process; \*
- 3) Sewebebis process;      4) agregatul mdgradobis dakargvis process.
713. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:
- 1) agregatul mdgradobis SeZenis process;      2) mizidvis Sesustebis process;      3) Sewebebis process; \*      4) gamol eqvis process.
714. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:
- 1) mcire agregatebad daSl is process; \*
- 2) SeerTebis process;
- 3) Sewebebis process;

4) mizidvis gaZl ierebis process.

715. koagul acia ar warmoadgens dispersiul i fazis nawil akebis:

1)

gamsxvil ebis process;

2) SeerTebis process;

3) ganzidvis gaZl ierebis process; \*

4) gamol eqvis winmswreb process.

716. ionTa makoagul irebel i unari damokidebul i ar aris:

1) ionis hidrataciis xarisxze;

2) ionis muxtze;

3)  $\xi$  (Zeta) potencial is sidideze;

4) damokidebul ia TiToeul zemoT CamoTvl il faqtorze.\*

717. ionTa makoagul irebel i unari damokidebul i ar aris:

1) ionis muxtze;

2) difuziis gradientze; \*

3)  $\xi$  (Zeta) potencial is sidideze;

4) zol is muxtze.

718. CamoTvl il Tagan razea damokidebul i ionTa makoagul irebel i unari:

(i) ionis muxtze; (ii) ionis hidrataciis xarisxze; (iii) kritikul potencial ze?

1) ida ii; 2) ii da iii; 3) i da iii; 4) i, ii da iii. \*

719. CamoTvl il Tagan razea damokidebul i ionTa makoagul irebel i unari: (i) ionis muxtze; (ii)  $\xi$  (Zeta) potencial is sidideze; (iii) osmosur wnevaze?

1) ida ii; \* 2) ii da iii; 3) i da iii; 4) i, ii da iii.

720. CamoTvl il Tagan razea damokidebul i ionTa makoagul irebel i unari: (i) difuziis gradientze; (ii)  $\xi$  (Zeta) potencial is sidideze; (iii) ionTa hidrataciis xarisxze?

1) ida ii; 2) ii da iii; \* 3) i da iii; 4) i, ii da iii.

721. CamoTvl il Tagan razea damokidebul i ionTa makoagul irebel i unari: (i) zol is muxtze; (ii)  $\xi$  (Zeta) potencial is sidideze; (iii) ionTa hidrataciis xarisxze?

1) i & ii; 2) ii & iii; 3) i & iii; 4) i, ii & iii. \*

722. dispersiul i sistemebis umdgradobis faqtoria:

1) el eqtrul i muxtis arseboba dispersiul nawil akebze;

2) kol oiduri nawil akebis sol vataciis unaroba;\*

3) sakmarisi zedapirul i energia;

4) ( Zeta) potencial is arseboba.

723. CamoTvl il Tagan, romel ia dispersiul i sistemebis umdgradobis faqtori:

(i) el eqtrul i muxtis arseboba dispersiul nawil akebze; (ii) kol oiduri nawil akebis sol vataciis unari; (iii) ( Zeta) potencial is arseboba?

1) mxol od i; 2) mxol od ii; 3) i da iii; 4) arcerTi. \*

724. CamoTvl il Tagan, romel ia dispersiul i sistemebis umdgradobis faqtori:

(i) el eqtrul i muxtis arseboba dispersiul nawil akebze; (ii) Warbi zedapirul i energia; (iii) ( Zeta) potencial is arseboba?

1) mxol od i; 2) mxol od ii; \* 3) i da iii; 4) arcerTi.

725. dispersiul i sistemis mdgradoba miT nakl ebia, rac:

- 1) metia sistemis mocul oba;
- 2) nakl ebia sadispersio aris nawil akebis pol aroba;
- 3) metia zedapirul i daWimul oba; \*
- 4) metia dispersiul i fazis nawil akebis xsnadoba.

726. CamoTvl il Tagan, romel ia dispersiul i sistemebis umdgradobis faqtori: (i) kol oiduri nawil akis hidrataciis unari; (ii) el eqtrul i muxtis arseboba dispersiul nawil akebbe; (iii) (Zeta) potencial is arseboba?

- 1) mxol odi;
- 2) mxol od ii;
- 3) ida iii;
- 4) arcerTi.\*

727. CamoTvl il Tagan, romel ia dispersiul i sistemebis umdgradobis faqtori: (i) Warbi zedapirul i energia; (ii) kol oiduri nawil akis hidrataciis unari; (iii) (Zeta) potencial is arseboba?

- 1) mxol odi;\*
- 2) mxol od ii;
- 3) i da iii;
- 4) arcerTi.

728. dadgenil ia, rom natural uri l ateqsis gl obul ebs aqvs uaryofiTi el eqtrul i muxti. romel i el eqtrol itis moqmedeba aris maqsimal urad efeqturi l ateqsidan kauCukis gamosayofad?

- 1)  $\text{Na}_2\text{SO}_4$ ;
- 2)  $\text{K}_4[\text{Fe}(\text{CN})_6]$ ;
- 3)  $\text{Fe}_2(\text{SO}_4)_3$ ;
- 4)  $\text{FeSO}_4$ .

729. dadgenil ia, rom natural uri l ateqsis gl obul ebs aqvs uaryofiTi el eqtrul i muxti. romel i el eqtrol itis moqmedeba aris minimal urad efeqturi l ateqsidan kauCukis gamosayofad?

- 1)  $\text{NaNO}_3$ ;
- 2)  $\text{Cd}_2[\text{Fe}(\text{CN})_6]$ ;
- 3)  $\text{MgSO}_4$ ;
- 4)  $\text{Al}_2(\text{SO}_4)_3$ .

730. yvel a el eqtrol its SeuZl ia gamoiwvios l iofoburi zol is koagul acia. makoagul irebel i unariT xasiaTdeba is ionebi, romel Ta muxti:

- 1) iseTivea, rogoric granul as muxti;
- 2) difuziuri Sris ionebis muxtis sapirispiroa;
- 3) potencial ganmsazRvrel i ionis muxtis niSnisaa;
- 4) arcerTi pasuxia swori.\*

731. yvel a el eqtrol its SeuZl ia gamoiwvios l iofoburi zol is koagul acia. makoagul irebel i unariT xasiaTdeba is ionebi, romel Ta muxti:

- 1) iseTivea, rogoric granul as muxti;
- 2) difuziuri Sris ionebis muxtis sapirispiroa;
- 3) potencial ganmsazRvrel i ionis muxtis sapirispiroa; \*
- 4) micel as muxtis sapirispiroa.

732. biogenuri ewodeba:

- 1) organul nivTierebebsi Semaval nebismier el ements;
- 2) el ementebis, roml ebic monawil eoben organizmis agebaSi da ara funqcionirebaSi;
- 3) el ementebis, roml ebic monawil eoben organizmis funqcionirebaSi da ara mis agebaSi;
- 4) el ementebis, roml ebic monawil eoben organizmis agebasa da mis funqcionirebaSi; \*

733. "sicocxl is metal ebi" organizmSi aris:

- 1) mxol od hidratirebul i ionebis saxiT;
- 2) mxol od biol igandebTan kompl eqsebis saxiT.
- 3) martivi nivTierebebis saxiT;

- 4) hidratirebul i ionebisa da biol igandebTan kompl eqsebis saxiT.\*
734. qimiuri el ementebis romel rigSia mxol od "sicocxl is metal ebis" Semadgenl obaSi Semaval i el ementi?
- 1) Li, Na, K, Ca, Mg;            2) Mg, Ca, Cr, Fe, Cu;  
 3) Mg, Ca, Fe, Ni, Cu;        4) Mg, Fe, Cu, Mo, Co.\*
735. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Mg, (ii) Cd, (iii) Cr, (iv) Fe, (v) Cu?
- 1) i, ii, iii;            2) i, iii, iv;            3) i, iv, v; \*            4) iii, iv, v.
736. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Li, (ii) Cd, (iii) Zn, (iv) Fe, (v) Cu?
- 1) i, ii, iii;            2) i, iii, iv;            3) i, iv, v;            4) iii, iv, v.\*
737. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Mg, (ii) Cd, (iii) Zn, (iv) Pt, (v) Cu?
- 1) i, ii, iii;            2) i, iii, v; \*            3) i, iv, v;            4) iii, iv, v.
738. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Mg, (ii) Zn, (iii) K, (iv) Be, (v) Os?
- 1) i, ii, iii; \*            2) i, iii, iv;            3) i, iv, v;            4) iii, iv, v.
739. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Mg, (ii) Zn, (iii) Cr, (iv) W, (v) Cu?
- 1) i, ii, iii;            2) i, iii, iv;            3) i, ii, v; \*            4) iii, iv, v.
740. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Zn, (ii) Cd, (iii) Na, (iv) Fe, (v) Au?
- 1) i, ii, iii;            2) i, iii, iv; \*            3) i, iv, v;            4) iii, iv, v.
741. CamoTvl il Tagan, romel ia "sicocxl is metal i": (i)Ta, (ii) Mn, (iii) Cr, (iv) Fe, (v) Cu?
- 1) i, ii, iii;            2) i, iii, iv;            3) i, iv, v;            4) ii, iv, v.\*
742. CamoTvl il Tagan, romel ia mxol od organizmi saTvis saWi ro makroel ementebi: (i) Na, (ii) Mg, (iii) Ca, (iv) F?
- 1) i, ii, iii; \*            2) i, ii, iv;            3) ii, iii, iv;            4) mxol od i & ii.
743. CamoTvl il Tagan, romel ia mxol od organizmSi arsebul i mikroel ementebi: (i) Na, (ii) Ba, (iii) Ca, (iv) F?
- 1) i, ii, iii;            2) i, ii, iv;            3) ii, iii, iv;            4) mxol od ii da iv.\*
744. CamoTvl il Tagan, romel ia mxol od organizmSi arsebul i ul tramikroel ementebi: (i) Au, (ii) U, (iii) Ca, (iv) F?
- 1) i, ii, iii;            2) i, ii, iv;            3) ii, iii, iv;            4) mxol od i da ii.\*
745. CamoTvl il Tagan, romel ia mxol od organizmi saTvis saWi ro makroel ementebi: (i) Na, (ii) As, (iii) P, (iv) S?
- 1) i, ii, iii;            2) i, iii, iv; \*            3) ii, iii, iv;            4) mxol od i da ii.
746. CamoTvl il Tagan, romel ia mxol od organizmi saTvis saWi ro mikroel ementebi: (i) Ca, (ii) As, (iii) Co, (iv) F?
- 1) i, ii, iii;            2) i, ii, iv;            3) ii, iii, iv; \*            4) mxol od i da ii.
747. CamoTvl il Tagan, romel ia mxol od organizmi saTvis saWi ro makroel ementebi: (i) Co, (ii) Mg, (iii) Ca, (iv) Cl?
- 1) i, ii, iii;            2) i, ii, iv;            3) ii, iii, iv; \*            4) mxol od i da ii.

748. CamoTvl il Tagan, romel ia mxol od organizmisaTvis saWiro makroel ementebis: (i) K, (ii) Ca, (iii) Cu, (iv) Cl?

1) i, ii, iii; 2) i, ii, iv; \* 3) ii, iii, iv; 4) mxol od i da ii.

749. qimiuri el ementebis romel rigSia mxol od organizmisaTvis saWiro makroel ementebis?

1) Li, Na, Mg, Ca; 2) Na, Mg, Ca, Fe; 3) Na, Mg, Ca, I; 4) Na, Mg, Ca, Cl. \*

750. mikroel ementis minimal uri raodenoba adamianis organizmSi SeiZl eba iyos:

1)  $10^{-2}\%$ ; 2)  $10^{-4}\%$ ; 3)  $10^{-5}\%$ ; \* 4)  $10^{-6}\%$ ;

751. organizmSi makroel ementebis funqcia ar aris:

1) osmosuri wnevis mudmivobis SenarCuneba;

2) fuZe-mJavuri Sedgenil obis mudmivobis SenarCuneba;

3) qsovil is ageba;

4) l iTon-l iganduri homeostazis SenarCuneba. \*

752. romel procesSi ar monawil eobs mikroel ementebis?

1) qsovil ur sunTqvaSi; 2) toqsikuri nivTiererebebis gauvnebl obaSi;

3) qsovil ebis agebaSi; \* 4) Jangva-aRdgeniT procesebSi.

753. qimiuri el ementebis romel rigSia mxol od toqsikuri el ementebis?

1) Be, Mg, Cs; 2) Hg, Pb, Zn; 3) Be, Hg, Mo; 4) Be, Tl, Hg; \*

754. moyvanil i mosazrebebidan romel ia mcdari?

1) organizmSi wyal badi arsebobs rogorc  $H^+$ , ise  $H^-$  ionis saxiT; \*

2)  $H^+$  sakmaod Zl ieri mJangavia;

3) organizmSi  $H^+$  ar amJRavnebs mJangav bunebas;

4)  $H^+$ -s aqvs Zl ieri mapol arizebel i buneba;

755. CamoTvl il Tagan, romel i araa orfuZiani mJava: (i)  $HPO_4^-$ , (ii)  $H_2CO_3$ , (iii)  $H_3PO_3$ ?

1) mxol od ii; 2) mxol od i; \* 3) i da iii; 4) ii da iii

756. CamoTvl il Tagan, romel ia orfuZiani mJava: (i)  $HSO_4^-$ , (ii)  $H_2PO_4^-$ , (iii)  $HClO_4$ ?

1) mxol od ii; \* 2) mxol od iii; 3) i da iii; 4) ii da iii

757. CamoTvl il Tagan, romel ia erTfuZiani mJava: (i)  $H_2PO_4^-$ , (ii)  $HPO_3^{2-}$ , (iii)  $HCO_3^-$ ?

1) mxol od ii; 2) mxol od iii; \* 3) i da iii; 4) ii da iii

758. CamoTvl il JangbadnaerTTagan, romel i araa stabil uri: (i)  $CO_2$ , (ii)  $H_2O_2$ , (iii)  $N_2O_5$ ?

1) mxol od i; 2) mxol od ii; 3) mxol od iii; 4) ii da iii. \*

759. CamoTvl il JangbadnaerTTagan, romel i araa stabil uri: (i)  $CO_2$ , (ii)  $H_2O$ , (iii)  $NO$ ?

1) mxol od i; 2) mxol od ii; 3) mxol od iii; \* 4) ii da iii.

760. CamoTvl il JangbadnaerTTagan, romel Si iwvis mraval i naerTi: (i)  $SO_2$ , (ii)  $H_2O$ , (iii)  $NO_2$ ?

1) mxol od i; 2) mxol od ii; 3) mxol od iii; \* 4) ii da iii.

761. CamoTvl il Tagan, romel i el ementi xasiaTdeba al otropi iT: (i) S, (ii) H, (iii) O?

1) mxol od iii; 2) i da ii; 3) ii da iii; 4) i da iii. \*

762. Jangbadis areSi wwisas oqsi ds warmoqmni s:

1) Li; \* 2) Na; 3) K; 4) Rb.



763. რომელი ნივთიერებასთან არ ურთიერთქმედებს წყალბადის უსაბუნებარო?  
 1) Na; 2) Cl<sub>2</sub>; 3) Si; \* 4) O<sub>2</sub>.
764. გამოთვლითი ელემენტებიდან რომელი არ გამოიყვანება ჰიდროქსიდების?  
 1) K; 2) Na; 3) Rb; 4) Ca.\*
765. გამოთვლითი ნაწილებიდან რომელი სესაბამება პერიოდების?  
 1) O<sup>2-</sup>; 2) O<sub>2</sub><sup>-</sup>; 3) O<sub>2</sub><sup>2-</sup>; \* 4) O<sup>-</sup>.
766. გამოთვლითი ნაწილებიდან რომელი გამოიყვანება ატმოსფეროში?  
 1) KF; 2) KCl; 3) KBr; 4) KI.\*
767. აზოტის უსაბუნებარო არ ურთიერთქმედებს:  
 1) ჟანგბადთან; \* 2) წყალბადთან; 3) კალციუმთან; 4) ჯანგბადთან.
768. გამოთვლითი ელემენტებიდან რომელი იტონთან არ რეაგირებს კონცენტრირებული აზოტის მარილი:  
 1) Ag; 2) Au; \* 3) Cu; 4) Hg.
769. რომელი ნივთიერებაა ატმოსფეროში რადიკალი?  
 1) ნახშირბად(II)-ის ოქსიდი; 2) აზოტ(II)-ის ოქსიდი; \*  
 3) გოგირდ(IV)-ის ოქსიდი; 4) ნახშირბად(IV)-ის ოქსიდი.
770. გამოთვლითი მოლეკულა ატმოსფეროში რადიკალი: (i) H<sub>2</sub>O, (ii) NO, (iii) NO<sub>2</sub>?  
 1) მხოლოდ ii; 2) მხოლოდ iii; 3) i და ii; 4) ii და iii.\*
771. გამოთვლითი ოქსიდატორი, რომელია თოქსიკური მცირე დოზებით: (i) H<sub>2</sub>O, (ii) N<sub>2</sub>O, (iii) NO<sub>2</sub>?  
 1) მხოლოდ ii; 2) მხოლოდ iii; \* 3) i და ii; 4) ii და iii.
772. გამოთვლითი მოლეკულა ატმოსფეროში თოქსიკური მარალი დოზებით: (i) CO<sub>2</sub>, (ii) N<sub>2</sub>O, (iii) NO<sub>2</sub>?  
 1) მხოლოდ ii; 2) მხოლოდ iii; 3) i და ii; 4) ii და iii.\*
773. ფოსფორის გამოთვლითი ალტროპიული სახეებიდან რომელი არ არის ატმოსფეროში კრისტალიზებული?  
 1) ტეტრა; \* 2) ვიტალი; 3) სავსე; 4) სამივე.
774. ნატრიუმის ფოსფატის ფორმულაა:  
 1) Na<sub>3</sub>PO<sub>3</sub>; 2) Na<sub>2</sub>HPO<sub>3</sub>; \* 3) NaH<sub>2</sub>PO<sub>3</sub>; 4) Na<sub>3</sub>PO<sub>4</sub>.
775. რომელი ნაერთი სედიმენტის, ზირითადი, ზღვის ქვიშაა?  
 1) Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>; 2) 3Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>·CaCl<sub>2</sub>; 3) 3Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>·CaF<sub>2</sub>; 4) 3Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>·Ca(OH)<sub>2</sub>.\*
776. სისხლის კალციუმის შემცველი ორგანიზმის დროს ფოსფორის რეაგირება ორგანიზმის:  
 1) იზრდება; 2) მცირდება; \* 3) არ იცვლება; 4) დამოკიდებულია ორგანიზმის ტემპერატურაზე.
777. რომელი ელემენტი მხოლოდ ატმოსფეროში არის მხოლოდ დაკავშირებული ორგანიზმის ფოსფორის მხოლოდ?  
 1) K; 2) Na; 3) Mg; 4) Ca.\*
778. რადიოაქტიური ფოსფორის შემცველი რომელი ნაერთი გამოიყვანება კრონიკული ეიკოზის სამკურნალო დაავადების დიაგნოსტიკისთვის?  
 1) Na<sub>2</sub>HPO<sub>3</sub>; 2) Na<sub>2</sub>HPO<sub>4</sub>; 3) NaH<sub>2</sub>PO<sub>4</sub>; 4) Na<sub>3</sub>PO<sub>4</sub>.\*
779. გამოთვლითი ელემენტებიდან რომელი არ გამოიყვანება ოქსიდების?  
 1) Hg; 2) He; \* 3) Cl; 4) Xe.
780. სახეებიანი კალიუმის ატმოსფეროში შემცველი ჰაერის გათარებვის ხარისხი:

- 1) mwvandebe; 2) wiTI deba; 3) yviTI deba; 4) I urj deba.\*
781. ramdeni al otropiul i saxecvl il ebiT gv xvdeba gogirdi?  
1) 1; 2) 2; 3) 3; 4) 4.
782. romel i ar aris gogirdis al otropiul i saxecvl il eba?  
1) rombul i; 2) monokl inuri; 3) oqtaedrul i;\* 4) pl astikuri.
783. uwyl o gogirdmJavaSi romel i naerTis gaxsnisas warmoiqmneba ol eumi?  
1)  $H_2S$ ; 2)  $SO_2$ ; 3)  $SO_3$ ;\* 4)  $NH_3$ .
784. romel nivTierebas iyeneben oTaxSi vercxl iswl is daRvrisas?  
1) azots; 2) fosfors; 3) gogirds;\* 4) naxSirbadis dioqsids.
785. reaqciebSi rogorc mJangavi, ise aRmdgeni SeiZI eba iyos:  
1)  $H_2S$ ; 2)  $SO_2$ ;\* 3)  $SO_3$ ; 4)  $H_2SO_4$ .
786. araaqtiur metal ebTan koncentrirebul i gogirdmJavas urTierTqmedebi T ZiriTadad mi iReba:  
1) 1)  $H_2S$ ; 2)  $SO_2$ ;\* 3)  $SO_3$ ; 4) S.
787. CamoTvl il mol ekul aTagan, romel ia radikal i: (i)  $H_2O$ , (ii) NO, (iii)  $N_2O$ ?  
1) mxol od ii;\* 2) mxol od iii; 3) i da ii; 4) ii da iii.
788. CamoTvl il JangbadnaerTTagan, romel i araa stabil uri: (i) CO, (ii)  $H_2O$ , (iii)  $N_2O_5$ ?  
1) mxol od ii; 2) mxol od iii;\* 3) mxol od i; 4) ii da iii.
789. CamoTvl il JangbadnaerTTagan, romel ia stabil uri: (i)  $CO_2$ , (ii)  $H_2O_2$ , (iii) NO?  
1) mxol od i; \* 2) mxol od ii; 3) mxol od iii; 4) ii da iii.
790. CamoTvl il mol ekul aTagan, romel ia biradikal i: (i)  $H_2O$ , (ii) NO, (iii)  $O_2$ ?  
1) mxol od ii; 2) mxol od iii;\* 3) i da ii; 4) ii da iii.
791. CamoTvl il ebidan romel i iTonTan ar reagirebs koncentrirebul i azotmJava oTaxis temperaturaze:  
1) Fe;\* 2) Mg; 3) Cu; 4) Pb.
792. zogierT metal Tan azotis urTierTqmedebis sas mi iReba:  
1) ni tratebi; 2) ni tritebi; 3) ni tridebi;\* 4) nitrozil ql oridi.
793. CamoTvl il Tagan, romel i el ementi xasiaTdeba al otropi iT:  
(i) N, (ii) H, (iii) P?  
1) mxol od iii; \* 2) i da ii; 3) ii da iii; 4) i da iii.
794. CamoTvl il Tagan, romel i el ementi xasiaTdeba al otropi iT:  
(i) K, (ii) P, (iii) S?  
1) mxol od iii; 2) i da ii; 3) ii da iii; \* 4) i da iii.
795. metal ebTan fosforis urTierTqmedebis sas mi iReba:  
1) fosfatebi; 2) fosfitebi; 3) fosfidebi;\* 4) pirofosfatebi.
796. metafosformJavas formul aa:  
1)  $H_3PO_3$ ; 2)  $H_3PO_4$ ; 3)  $HPO_3$ ;\* 4)  $H_4P_2O_7$ .
797. pirofosformJavas formul aa:  
1)  $H_3PO_3$ ; 2)  $H_3PO_4$ ; 3)  $HPO_3$ ; 4)  $H_4P_2O_7$ . \*
798. fosforovanmJavas formul aa:  
1)  $H_3PO_3$ ;\* 2)  $H_3PO_4$ ; 3)  $HPO_3$ ; 4)  $H_4P_2O_7$ .
799. orTofosformJavas formul aa:  
1)  $H_3PO_3$ ; 2)  $H_3PO_4$ ;\* 3)  $HPO_3$ ; 4)  $H_4P_2O_7$ .
800. CamoTvl il i maril ebidan ar arsebobs:

- 1)  $\text{Na}_4\text{P}_2\text{O}_7$ ; 2)  $\text{NaH}_2\text{PO}_4$ ; 3)  $\text{K}_3\text{HP}_2\text{O}_7$ ; \* 4)  $\text{KH}_2\text{PO}_3$ .
801. CamoTvl il i nivTiererebebidan romel i ar ix sneba maril mJavaSi?
- 1)  $\text{CaCO}_3$ ; 2)  $\text{BaSO}_4$ ; \* 3)  $\text{BaSO}_3$ ; 4)  $\text{Ag}_3\text{PO}_4$ .
802. maRal temperaturaze peroqsidibis warmoqmni T JangbadTan reagirebs:
- 1) I iTiumi; 2) natriumi; \* 3) TuTia; 4) rkina.
803. CamoTvl il ebidan romel i ionia sul fidebis aRmomCeni?
- 1)  $\text{Ag}^+$ ; 2)  $\text{Ba}^{2+}$ ; 3)  $\text{Pb}^{2+}$ ; \* 4)  $\text{K}^+$ .
804. CamoTvl il Tagan, romel ia orfuZiani mJava: (i)  $\text{H}_3\text{PO}_4$ , (ii)  $\text{H}_2\text{SeO}_4$ , (iii)  $\text{H}_3\text{PO}_3$ ?
- 1) mxol od ii; 2) mxol od iii; 3) i da iii; 4) ii da iii \*
805. CamoTvl il Tagan, romel ia samfuZiani mJava: (i)  $\text{H}_3\text{PO}_4$ , (ii)  $\text{H}_2\text{SeO}_4$ , (iii)  $\text{H}_3\text{PO}_3$ ?
- 1) mxol od i; \* 2) mxol od iii; 3) i da iii; 4) ii da iii
806. pirofosformJava:
- 1) erTfuZiania; 2) orfuZiania; 3) samfuZiania; 4) oTxfuZiania.\*
807. CamoTvl il i mJavebidan romel ia samfuZiani?
- 1)  $\text{H}_2\text{S}_2\text{O}_7$ ; 2)  $\text{H}_3\text{PO}_3$ ; 3)  $\text{H}_4\text{P}_2\text{O}_7$ ; 4) arcerTi.\*
808. kal iumis sul fidi warmoiqmneba gogirdis urTierTqmedebis as:
- 1) koncentrirebul gogirdmJavasTan; 2) koncentrirebul azotmJavasTan;
- 3) ganzavebul gogirdmJavasTan; 4) tutis cxel xsnarTan.\*
809. moyvanil i mJavebidan romel ia yvel aze susti?
- 1)  $\text{H}_2\text{SO}_4$ ; 2)  $\text{H}_2\text{CO}_3$ ; 3)  $\text{H}_2\text{S}$ ; \* 4)  $\text{HNO}_3$ .
810. azotis oqsidibidan romel ia Txevad mdgomareobaSi oTaxis temperaturaze?
- 1)  $\text{N}_2\text{O}_3$ ; \* 2)  $\text{N}_2\text{O}$ ; 3)  $\text{N}_2\text{O}_4$ ; 4)  $\text{N}_2\text{O}_5$ .
811. romel I iTonTan reagirebs azoti oTaxis temperaturaze?
- 1) Li; \* 2) K; 3) Na; 4) Ca.
812. rkinasTan urTierTqmedebis as naxSirbadis monoqsidi warmoqmni s:
- 1) dikarbonil s; 2) trikarbonil s;
- 3) tetrakarbonil s; 4) pentakarbonil s.\*
813. CamoTvl il i oqsidibidan romel ia sunTqvis centris fiziologiuri stimulatori?
- 1) CO; 2)  $\text{CO}_2$ ; \* 3)  $\text{N}_2\text{O}$ ; 4)  $\text{NO}_2$ .
814. romel i nivTiereba gamoiyeneba kuWis wenis mJavianobis gazrdias antacidur saSual ebad?
- 1)  $\text{NaHSO}_4$ ; 2)  $\text{Na}_2\text{HPO}_4$ ; 3) NaOH; 4)  $\text{NaHCO}_3$ . \*
815. CamoTvl il Tagan, romel i el ementi xasiaTdeba al otropi iT: (i) S, (ii) C, (iii) Cl?
- 1) mxol od iii; 2) i da ii; \* 3) ii da iii; 4) i da iii.
816. CamoTvl il Tagan, romel i el ementi xasiaTdeba al otropi iT: (i) C, (ii) H, (iii) N?
- 1) mxol od iii; 2) i da ii; 3) ii da iii; 4) mxol od i \*
817. naxSirbadis monoqsidis mol ekul aSi naxSirbadsa da Jangbads Soris:
- 1) erTmagi bmaa; 2) ormagi bmaa; 3) sammagi bmaa; \* 4) oTxmagi bmaa.
818. qvemoTCamoTvl il Tagan romel ia saWmel i soda?
- 1)  $\text{Na}_2\text{SO}_4$ ; 2)  $\text{NaHSO}_3$ ; 3)  $\text{Na}_2\text{CO}_3$ ; 4)  $\text{NaHCO}_3$ . \*

819. ras warmoqmnis naxSirbadi metal ebTan reagirebisas?

1) karborunds; 2) karbonatebs; 3) sul fidebs; 4) karbi debs.\*

820. romel i naxSirbadatomebi gv xvdeba araganStoebul i j aWvis mqone al kanebis mol ekul ebSi?

1) mxol od pirvel adi; 2) mxol od meoreul i; 3) mxol od pirvel adi da meoreul i;\* 4) pirvel adi, meoreul i da mesameul i.

821. CamoTvl il i al kanebidan romel i arsebobs optikuri izomerebis saxiT?

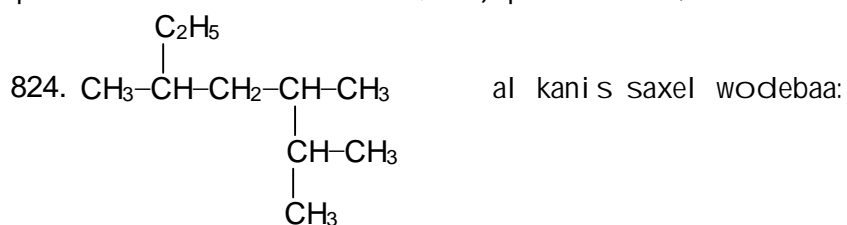
1) 2-meTil heqsani; 3) 3-meTil heqsani;\* 3) 3-meTil pentani; 4) 3-eTil heqsani.

822.  $C_4H_9$ - Sedgenil obis ramdeni radikal i arsebobs?

1) 1; 2) 2; 3) 3; 4) 4.\*

823. romel i naxSirbadatomebi gv xvdeba izobutanis mol ekul aSi?

1) mxol od pirvel adi; 3) mxol od pirvel adi da meoreul i; 3) mxol od pirvel adi da mesameul i;\* 4) pirvel adi, meoreul i da mesameul i.



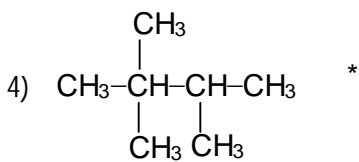
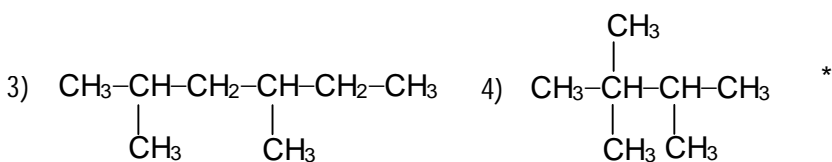
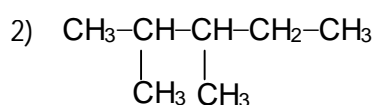
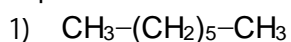
1) 2-eTil -4-izopropil pentani;

2) 2,3-dimeTil -5-eTil heqsani;

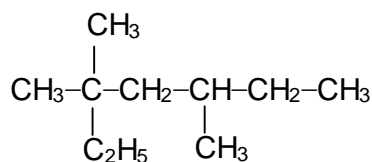
3) 2,3,5-trimeTil heptani;\*

4) 3,5,6-trimeTil heptani.

825.  $C_7H_{16}$  Sedgenil obis romel isomers aqvs yvel aze dabal i duRil is temperatura?

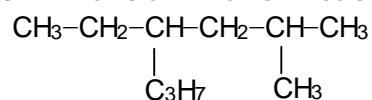


826. ramdeni naxSirbadatomebi qvemoT mocemul i al kanis ZiriTad j aWvSi?



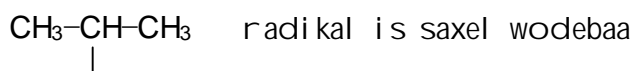
1) 5; 2) 6; 3) 7;\* 4) 4.

827. ramdeni naxSirbadatomebi qvemoT mocemul i al kanis ZiriTad j aWvSi?



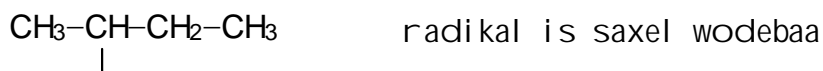
1) 5; 2) 6; 3) 7;\* 4) 4.

828.



- 1) eTil i; 2) propil i; 3) izopropil i;\* 4) dimeTil meTil i.

829.



- 1) butil i; 2) izobutil i; 3) meor-butil i;\* 4) mesam-butil i.

830.



- 1) butil i; 2) izobutil i; 3) meor-butil i; 4) mesam-butil i.\*

831. n-heqsanis struqturul formul aSi mesame naxSirbadatomi aris:

- 1) pirvel adi; 2) meoreul i;\* 3) mesameul i; 4) meoTxeul i.

832. CamoTvl il i radikal ebidan romel ia meoreul i?

- 1) eTil is; 2) izopropil is;\* 3) izobutil is 4) arcerTi.

833. qvemoT moyvanil i saxel wodebebidan romel ia arasworad miTiTebul i?

- 1) 2-propil oqtani;\* 2) 2-meTil pentani; 3) 2,2-dimeTil propani; 4) yvel a.

834. CamoTvl il i naxSirwyal badebidan roml is duRil is temperaturaa yvel aze maRal i?

- 1) n-heqsani;\* 2) 2,2-dimeTil butani;  
3) 2,3-dimeTil butani; 4) 2-meTil pentani.

835. CamoTvl il i reagentebidan romel Tan ar urTierTqmedebs eTani?

- 1) azotmJava; 2) maril mJava;\* 3) ql ori; 4) Jangbadi.

836. rogori meqanizmiT mimdinareobs izobutanis ql orireba?

- 1) el eqtrofil uri Canacvl ebis; 2) radikal uri Canacvl ebis;\*  
3) nukl eofil uri Canacvl ebis; 4) el eqtrofil uri mierTebis.

837. CamoTvl il i naerTebidan romel i ar reagirebs ql orwyal badTan?

- 1) izobutani;\* 2) propeni; 3) butadieni; 4) eTini.

838. CamoTvl il i naerTebidan romel i ar reagirebs wyal Tan?

- 1) izobutani;\* 2) propeni; 3) butadieni; 4) eTini.

839. butanisaTvis ar aris damaxasiaTebel i:

- 1) Canacvl ebis reaqciebi; 2) mierTebis reaqciebi;\*  
3) Jangvis reaqciebi; 4) krekingi.

840. eTanisaTvis ar aris damaxasiaTebel i:

- 1) Canacvl ebis reaqciebi; 2) krekingi;  
3) Jangvis reaqciebi; 4) pol imerizaciis reaqciebi.\*

841. 2,2-dimeTil propanSi:

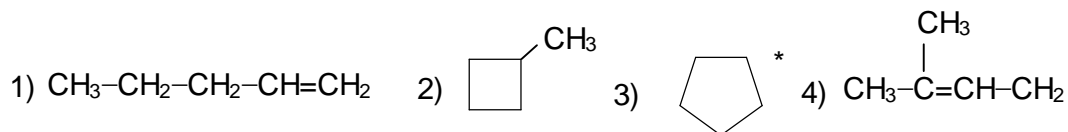
- 1) mxol od pirvel adi naxSirbadatomebia;  
2) pirvel adi da meoreul i naxSirbadatomebia;  
3) pirvel adi da mesameul i naxSirbadatomebia;  
4) pirvel adi da meoTxeul i naxSirbadatomebia.\*

842. CamoTvl il i al kanebidan romel s aqvs suni?

- 1)  $C_{15}H_{32}$ ; \* 2)  $C_{16}H_{34}$ ; 3)  $C_{17}H_{36}$ ; 4) arcerTs.
843. romel i bmebi wydeba al kanebis krekingis dros?  
 1) mxol od C-H ; 2) mxol od C-C ; 3) mxol od C=C;  
 4) rogorc C-H , ise C-C.\*
844. romel i naxSirwyal badis ql orirebiT warmoiqmneba mxol od erTi monoql ornawarmi?  
 1) n-pentani; 2) 2,2-dimeTil propani;\* 3) 2-meTil butani; 4) 2,3-dimeTil butani.
845. CamoTvl il i naxSirwyal baduri wyvil ebidan romel i ar aris izomerebi?  
 1) 3-eTil pentani da 2,2,3-trimeTil butani;  
 2) dekani da 4-izopropil heptani;  
 3) 2,2-dimeTil propani da 2-meTil butani;  
 4) 2,2,3,3-tetrameTil butani da 3-eTil heptani.\*
846. al kanebSi C-C bmis sigrZea:  
 1) 0,134 nm; 2) 0,140 nm; 3) 0,154 nm; \* 4) 0,120 nm.
847. ramdeni C-C bmaa nebismieri  $C_nH_{2n+2}$  al kanis Sedgenil obaSi?  
 1) n; 2) n-1;\* 3) 2n; 4) n+1.
848. radikal uri Canacvl ebis romel stadias miekuTvneba meTanis ql orirebisas ql oris mol ekul is daSl a atomebad?  
 1) j aWvis inicireba;\* 2) j aWvis zrda; 3) j aWvis gawyveta; 4) rekombinacia.
849. radikal uri Canacvl ebis romel stadias miekuTvneba meTanis ql orirebisas ql oris mol ekul is urTierTqmedeba meTil is radikal Tan?  
 1) j aWvis inicireba; 2) j aWvis zrda;\* 3) j aWvis gawyveta; 4) rekombinacia.
850. romel i nawil akia aqtiuri konoval ovis reaQciaSi (nitrireba)?  
 1)  $\cdot NO$ ; 2)  $\cdot NO_2$ ; \* 3)  $NO_2^+$ ; 4) arcerTi.
851. romel i tipis izomeria ar aris damaxasiaTebel i parafinebis nawarmTaTvis?  
 1) naxSirbadul i j aWvis; 2) optikuri;  
 3) geometriul i;\* 4) Camnacvl ebl is mdebareobis.
852. qvemoTCamoTvl il Tagan, romel i al kania myari normal ur pirobebSi?  
 1) meTani; 2) propani; 3) dekani; 4) heptadekani.\*
853. qvemoTCamoTvl il i radikal ebidan, romel ia mesameul i?  
 1)  $CH_3-CH_2-$ ; 2)  $(CH_3)_2CH-$ ; 3)  $(CH_3)_2CHCH_2-$ ; 4)  $(CH_3)_3C-$ .\*
854. romel al kans aqvs yvel aze maRal i duRil is temperatura?  
 1) n-heqsani;\* 2) 2-meTil pentani; 3) 3-meTil pentani; 4) 2,3-dimeTil butani.
855. romel i nawil akia aqtiuri izobutanis nitrirebas?  
 1)  $NO^+$ ; 2)  $NO$ ; 3)  $NO_2$ ; \* 4)  $NO_2^+$ .
856. romel i nawil akia aqtiuri propanis nitrirebas?  
 1)  $NO^+$ ; 2)  $NO$ ; 3)  $NO_2$ ; \* 4)  $NO_2^+$ .
857. romel naxSirbadatomTan mimdinareobs ufro advil ad nitroj gufis Canacvl eba 2-meTil butanSi?  
 1) pirvel Tan; 2) meoresTan;\* 3) mesamesTan; 4) meoTxesTan.
858.  $400^{\circ}C$ -ze 2-meTil butanis nitrirebisas:  
 1) warmoiqmneba, ZiriTadad, 2-meTil -1-nitrobutani;  
 2) warmoiqmneba, ZiriTadad, 2-meTil -2-nitrobutani;

- 3) warmoi qmneba, ZiriTadad, 2-meTil -3-nitrobutani;  
 4) nitrirebis procesi araregiosel eqciurad mimdinareobs.\*
859. oTaxis temperaturaze butanis Jangvisas miReba:  
 1) butilis spirti; 2) ZmarmJava;\* 3) erbomJava; 4) Jangvar xorciel deba.
860. al kanebis krekingi mimdinareobs 500°C-ze ufro maRal temperaturaze:  
 1) Jangbadian areSi; 2) uJangbado areSi;\* 3) haerze; 4) nebismier pirobebSi.
861. CamoTvl il i al kanebidan roml is krekingiT aris SesaZl ebel i eTanis miReba?  
 1) mxol od propanis; 2) mxol od butanis; 3) mxol od pentanis; 4) yvel asi.\*
862. CamoTvl il i naerTebidan romel Si gv xvdeba geometriul i izomeria?  
 1) al kanebSi; 2) al kinebSi; 3) cikl oal kanebSi;\* 4) arenebSi.
863. CamoTvl il i cikl oal kanebidan romel ia Txevadi?  
 1) cikl opropani; 2) cikl obutani; 3) cikl opentani;\* 4) arcerTi.
864. romel i naerTis katal izuri dehidrirebiTaa SesaZl ebel i benzol is miReba?  
 1) cikl opropani; 2) cikl obutani; 3) cikl opentani; 4) cikl oheqsani.\*
865. al kenebis izomerebia:  
 1) al kanebi; 2) cikl oal kanebi;\* 3) al kinebi; 4) arenebi.
866. romel naerTSi gv xvdeba "bananiseburi" bmebi?  
 1) propanSi; 2) cikl opropanSi;\* 3) propenSi; 4) propinSi.

867. rogoria  $C_5H_{12}$  Sedgenil obis naxSirwyal badis aRnagoba, Tu misi bromirebiT SesaZl ebel ia mxol od erTi monobromnawarmis miReba?



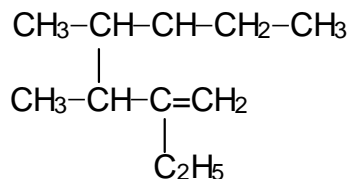
868. eTil enis mol ekul as aqvs:

- 1) wrfivi aRnagoba; 2) brtyel i aRnagoba;\*  
 3) tetraedrul i aRnagoba; 4) oqtaedrul i aRnagoba.

869. izomeriis romel i saxe ar aris damaxasiaTebel i butenis aTvis?

- 1) j aWvis; 2) optikuri;\* 3) geometriul i; 4) j eradi bmis mdebareobis.

870.



al kenis saxel wodebaa:

- 1) 2-eTil -3-izopentil -1-buteni;

2) 2-ethyl-3-methyl-1-butene;

3) 2-ethyl-3,4-dimethyl-1-heptene; \*

4) 3,4-dimethyl-2-ethyl-1-octene.

871. Camotvi il i ganmartebidan romel ia al kenebisatvis araswori?

1) mtavari j aWvia yvel aze grZel i naxSirbadul i j aWvi;

2) j aWvis danomvra xdeba im bol odan, sadac ufro axl osaa ganStoeba.

3) mtavari j aWvis naxSirwyal badis dasaxel eba xdeba im l okantis miTiTebiT, romel Tanac mtavrdeba ormagi bma;

4) yvel a.\*

872. romel i radikal is saxel wodebaa vinil i?

1) etenil is; \* 2) 1-propenil is; 2) 2-propenil is; 4) 1-butenil is.

873. propenisaTvis ar aris damaxasiaTebel i:

1) Canacvl ebis reaqciebi; \* 2) mierTebis reaqciebi;

3) Jangvis reaqciebi; 4) pol imerizaciis reaqciebi.

874. romel umartives al kens aqvs izomeri?

1) eteni; 2) propeni; \* 3) buteni; 4) penteni.

875. qvemoT Camotvi il i reagentebidan roml iT SeiZl eba 2-butenidan 1-butenis mocil eba?

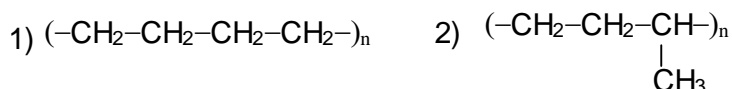
1) Br<sub>2</sub>; 2) HBr; 3) [Ag(NH<sub>3</sub>)<sub>2</sub>]OH; \* 4) arcerTiT.

876. 1-butenTan bromis urTierTqmedebiT mi iReba:

1) 1,1-dibrombutani; 2) 2,2-dibrombutani;

3) 1,2-dibrombutani; \* 4) 1,2-dibrom-1-buteni.

877. 2-butenis pol imerizaci iT miRebul i naerTis aRnagoba SeiZl eba gamoisaxos formul iT:



878. romel i homol ogiuri rigis nebismeri wevris erTnairi wonakis wisaTvis aris saWiro Jangbadis erTnairi mocul oba?

1) al kanebis; 2) al kenebis; \* 3) al kinebis; 4) arenebis.

879. butenisaTvis ar aris damaxasiaTebel i:

1) mierTebis reaqciebi; 2) Canacvl ebis reaqciebi; \*

3) Jangvis reaqciebi; 4) pol imerizaciis reaqciebi.

880. Camotvi il i ganmartebidan romel ia al kenebisatvis araswori?

1) π-bmis gaxl eCa mimdinareobs heterol izuri meqanizmiT;

2) zogierTi Canacvl ebul i al keni monawil eobs nukl eofil uri mierTebis reaqciebSi;

3) hal ogenireba mimdinareobs S<sub>E</sub> meqanizmiT; \*

4) fTorTan reagirebisas SesaZl ebel ia C-C bmis gawyveta.

881. rogoria naxSirbadatomebis hibridizaciis tipi propenSi?



1)  $sp^2$ -; 2)  $sp^3$ -; 3)  $sp^2$ - da  $sp^3$ -;\* 4)  $sp$ -.

882. al kenebis hal ogenirebisas sawyis etapze warmoqmnil i karbkationi aris:

1)  $\pi$ -kompl eqsi; 2)  $\sigma$ -kompl eqsi;\* 3) rogorc  $\pi$ -, ise  $\sigma$ -kompl eqsi;

4) arc  $\pi$ - da arc  $\sigma$ -kompl eqsi.

883. CamoTvl il i naerTebidan romel i warmoiqmneba Tanabari mol uri TanafardobiT aRebul i al kenisa da ql oris urTierTqmedebiT?

1) tetraql oral kani; 2) cis-1,2-dihal ogenal kani;

3) trans-1,2-dihal ogenal kani;\* 4) arcerTi.

884. romel i karbkationi warmoiqmneba, ZiriTadad, propenis hidrobromirebisas?

1) pirvel adi; 2) meoreul i;\* 3) mesameul i; 4) meoTxoul i.

885. romel i naerTi warmoiqmneba gogirdmJavaTi al kenebis katal izuri hidrataciis procesSi?

1) martivi eTeri; 2) rTul i eTeri;\* 3) ketoni; 4) al dehidi.

886. romel i naerTi miiReba propenis daJangvisas kal iumis permanganatis wyal xsnariT?

1) 1,2-propandioli;\* 2) 1,3-propandioli; 3) acetal dehidi; 4)  $CO_2$ .

887. rogori meqanizmiT mimdinareobs propenis hidrohal ogenireba?

1) radikal uri Canacvl ebis; 2) el eqtrofil uri Canacvl ebis;

3) el eqtrofil uri mierTebis;\* 4) nukl eofil uri mierTebis.

888. rogori meqanizmiT mimdinareobs al kenebis nitrireba:

1) radikal uri Canacvl ebis;\* 2) el eqtrofil uri Canacvl ebis;

3) el eqtrofil uri mierTebis; 4) nukl eofil uri mierTebis.

889. rogori meqanizmiT mimdinareobs 2-meTil -2-butenis hidrobromireba?

1) el eqtrofil uri mierTebis;\* 2) radikal uri Canacvl ebis;

3) nukl eofil uri mierTebis; 3) el eqtrofil uri Canacvl ebis.

890. rogoria al kenis aRnagoba, Tu mJava areSi kal iumis biqromatiT misi daJangvisas warmoiqmneba mxol od ZmarmJava?

1) 2-buteni;\* 2) 2-meTil -2-buteni;

3) 2,3-dimeTil -1-buteni; 4) 2,3-dimeTil -2-buteni.

891. rogori meqanizmiT mimdinareobs 2-butenis hidroql orireba?

1) el eqtrofil uri mierTebis;\* 2) radikal uri Canacvl ebis;

3) nukl eofil uri mierTebis; 4) el eqtrofil uri Canacvl ebis.

892. CamoTvl il i naerTebidan romel i arsebobs  $\pi$ -diastereomerebis saxiT?

1) 2-penteni;\* 2) 2-meTil -1-buteni; 3) 2-meTil -2-buteni; 4) 1-penteni.

893. CamoTvl il ebidan romel i hal ogenwyal badi reagirebs yvel aze aqtiurad propenTan?

1) HF; 2) HCl; 3) HBr; 4) HI.\*

894. CamoTvl il ebidan romel i hal ogenwyal badi reagirebs yvel aze aqtiurad 2-meTil propenTan?

1) HI;\* 2) HBr; 3) HCl; 4) HF.

895. rogoria al kenis aRnagoba, Tu qrom(VI)-is oqsidiT misi daJangvisas miiReba mxol od ZmarmJava?

1) 1-buteni; 2) 2-buteni;\* 3) 2-meTil propeni; 4) propeni.

896. ozoniT romel i al kinis daJangvisas miiReba mxol od naxSirbadis dioqsidi?  
 1) eTini;\* 2) propini; 3) 1-butini; 4) 2-butini.
897. romel i naerTi ar reagirebs vercxl is oqsidis amiakur xsnarTan?  
 1) 1-butini; 2) 2-butini;\* 3) 3-meTil -1-pentini; 4) meTil acetil eni.
898. ozoniT romel i naerTis daJangvisas ar miiReba naxSirbadis dioqsidi?  
 1) 2-butini;\* 2) propini; 3) eTini; 4) 3-meTil -1-heqsini.
899. romel i reaqqiIT SeiZl eba al kenebSi ormagi bmis mdebareobis dadgena? 1) Zal ze Zl ieri mJangavebiT daJangviT;\* 2) aRdgeniT; 3) hidrohal ogenirebiT; 4) hal ogenirebiT.
900. qvemoTCamoTvl i al kenebidan romel ia Txevadi oTaxis temperaturaze?  
 1) eTil eni; 2) propil eni; 3) deceni;\* 4) nonadeceni;
901. romel i tipis gamxsnel ebSi xasiaTdebian al kenebi kargi xsnadobiT?  
 1) pol arul i tipis; 2) arapol arul i tipis;\* 3) ol efinebis uxsnadebia nebismieri tipis gamxsnel Si; 4) ol efinebis xsnadoba damokidebul ia ara gamxsnel is tipze, aramed ormagi bmis mdebareobaze.
902. romel i katal izatori ar gamoiyeneba al kenebis hidrirebisas?  
 1) Pt; 2) Pd; 3) Ni; 4) Li.\*
903. markovnikovis reaqqiaSi, rogor imatebs hal ogenwyal badebis reaqqiaunarianoba hidrohal ogenidebis rigSi?  
 1) HF>HCl>HBr>HI;\* 2) HF<HCl<HBr<HI; 3) HCl<HI<HBr<HF; 4) HI<HCl<HF<HBr.
904. propenis hidrohal ogenirebisas Sual eduri produqtia:  
 1) karbani; 2) karbkationi;\* 3) pirvel adi radikal i; 4) meoreul i radikal i.
905. propenis hidrohal ogenirebis procesSi warmoqmnil i romel i Sual eduri produqtia ufro stabil uri?  
 1) pirvel adi karbkationi; 2) meoreul i karbkationi;\* 3) mesameul i karbkationi; 4) meoTxeul i karbkationi.
906. rogori tipis naerTia pol ietil eni?  
 1) naj eri, dabal mol ekul uri; 2) uj eri, dabal mol ekul uri; 3) naj eri, maRal mol ekul uri; 4) uj eri, maRal mol ekul uri.\*
907. romel i naerTebi auferul ebs kal iumis permanganatis wyal xsnars?  
 1) propani da propeni; 2) eTeni da eTini;\* 3) eTani da cikl oheqsani; 4) eTil eni da benzol i.
908. romel i naerTebi auferul ebs bromian wyal s?  
 1) propani da propeni; 2) eTeni da eTini;\* 3) eTani da cikl oheqsani; 4) eTil eni da benzol i.
909. romel i naxSirwyal badis radikal ia propargil i?  
 1) propanis; 2) propenis; 3) propinis;\* 4) cikl opropanis.
910. CamoTvl il i naerTebidan roml is duRil is temperaturaa yvel aze maRal i?  
 1) butani; 2) buteni; 3) 1-butini; 4) 2-butini.\*
911. izomeriis CamoTvl il i saxeebidan romel ia damaxasiaTebel i al ki nebi saTvis?

1) geometriul i; 2) j eradi bmis mdebareobis; \* 3) optikuri; 4) arcerTi.

912. CamoTvl il i naxSirwyal badebidan roml istTvis aris damaxasiaTebel i geometriul i izomeria?

1) al kenebisaTvis; \* 2) al kinebisaTvis; 3) arenebisaTvis; 4) arcerTisTvis.

913. sammagi bmis Semcvel i ramdeni izomeris saxiT gv xvdeba  $C_4H_6$  Sedgenil obis al kini?

1) 1; 2) 2; \* 3) 3; 4) 4.

914. CamoTvl il i naxSirwyal badebidan romel i Sedis ufro advil ad el eqtrofil uri mierTebis reaqciebSi?

1) pentani; 2) penteni; \* 3) pentini; 4) cikl opentani.

915. meTanis gasufTaveba acetil enisagan SeuZl ebel ia narevis:

1) bromian wyal Si gatarebiT;

2) vercxl is oqsidis amiakur xsnarSi gatarebiT; \*

3) tutis xsnarSi gatarebiT;

4) kal iumis permanganatis xsnarSi gatarebiT.

916. romel i naerTi miiReba acetil enis uaxl oesi homol ogis trimerizaciiT?

1) meta-qsil ol i; 2) 1,2,3-trimeTil benzol i;

3) 1,3,5-trimeTil benzol i; \* 4) propil benzol i.

917. benzol i miiReba acetil enis:

1) dimerizaciiT; 2) trimerizaciiT; \*

3) tetramerizaciiT; 4) pol imerizaciiT.

918. rogoria naxSirbadatomebis hibridizacii tipi propinSi?

1) mxol od  $sp^2$ -; 2) mxol od  $sp$ -; 3)  $sp$ - da  $sp^2$ -; 4)  $sp$ - da  $sp^3$ -.\*

919. romel i reagentiT SeiZl eba 1-pentinisa da 2-pentinis gansxvaveba erTmaneTisgan?

1)  $Br_2$ ; 2)  $HBr$ ; 3)  $[Ag(NH_3)_2]OH$ ; \* 4)  $H_2O$ .

920.  $CH_2=CH-C\equiv CH + Br_2$  gantol ebiT mimdinare reaqciis produqta:

1)  $CH_2=CH-CHBr=CHBr$ ; 2)  $CH_2Br-CHBr-C\equiv CH$ ; \*

3)  $CHBr=CH-C\equiv CH$ ; 4)  $CH_2=CH-C\equiv CBr$ .

921. el tekovis wesis mixedvit xorciel deba enol ebis:

1) hidrireba; 2) hidratacia; 3) hidrohali ogenireba; 4) izomerizacia.\*

922. kuCerovis reaqciit xorciel deba al kinebis:

1) hidrireba; 2) hidratacia; 3) hidrohali ogenireba; \* 4) Jangva.

923. CamoTvl il i naerTebidan roml is hidrataciit miiReba ketoni?

1) eTini; 2) eTeni; 3) propeni; 4) propini.\*

924. CamoTvl il i ionebidan roml is Tanaobisas xorciel deba kuCerovis reaqcia?

1)  $Ag^+$ ; 2)  $Hg^{2+}$ ; \* 3)  $Cu^{2+}$ ; 4) arcerTis.

925. vercxl is oqsidis amiakur xsnarTan reagirebs:

1) nebismieri al keni; 2) nebismieri al kini;

3) terminal uri al keni; 4) terminal uri al kini.\*

926. CamoTvl il i al kinebidan vercxl is oqsidis amiakur xsnarTan reagirebs:

1) 1-heqsini; \* 2) 2-heqsini; 3) 3-heqsini; 4) yvel a.

927. CamoTvl il Tagan romel i naxSirwyal badisaTvis aris damaxasiaTebel i C-H mJavuri Tvisebebi?

1) propanisaTvis; 2) propenisaTvis; 3) propinisaTvis;\* 4) arcerTisaTvis.

928. natriumis acetil enidi miReba acetil enis urTierTqmedebi T Txevad amiakSi gaxsnil :

1) natriumTan; 2) natriumis hidroqsidTan;

3) natriumis ql oridTan; 4) natriumis amidTan.\*

929. ozoniT romel i naerTis Jangvisas miReba naxSirbadis dioqsidi?

1) nebismieri al kanis; 2) nebismieri al kenis;

3) nebismieri al kinis; 4) terminal uri al kinis.\*

930. vinil acetil eni warmoiqmneba acetil enis:

1) reagirebiT vinil is spirtTan; 2) reagirebiT eTil enTan;

3) reagirebiT divinil Tan; 4) dimerizaciiT.\*

931. eTil enisa da acetil enis gansxvaveba SesaZI ebel ia:

1) bromiani wyl iT; 2) vercxl is oqsidis amiakuri xsnari;\*

3) ql orwyal badiT; 4) kal iumis permanganatis xsnariT.

932. minimum ramdeni naxSirbadatomis Semcvel al kins SeiZI eba hqondes ganStoebul i aRnagoba?

1) 4; 2) 5;\* 3) 6; 4) 7.

933. romel i reagentiT SeiZI eba 2-butinis gamoyofa 1-butinTan misi narevidan?

1) bromwyal badi; 2) wyal badi; 3) bromiani wyal i;

4) vercxl is oqsidis amiakuri xsnari.\*

934. romel i naerTis amiakur xsnarSi gatarebisas warmoiqmneba acetil enidebi?

1) mxol od spil enZ(II)-is ql oridis;

2) mxol od spil enZ(I)-is ql oridis;

3) mxol od vercxl is oqsidis;

4) rogorc vercxl is oqsidis, ise spil enZ(I)-is ql oridis.\*

935. benzol idan tol uol is miReba SesaZI ebel ia:

1) kuCerovis reaqciiT; 2) fridel -kraftsis reaqciiT;\*

3) CiCibabnis reaqciiT; 4) konoval ovis reaqciiT.

936. ra tipis katal izatoria saWiro benzol is hal ogenirebisas?

1) nebismieri mZime metal i; 2) l uisis mJava;\*

3) areni usis mJava; 4) brenstedis mJava;

937. vanadium(V)-is oqsidis Tanaobisas maRal temperaturaze JangbadiT romel i arenis daJangvisas miReba mal einis anhidridi?

1) benzol is;\* 2) tol uol is; 3) eTil benzol is; 4) qsil ol is.

938. CamoTvl il ebidan romel reaqcias iyeneben aromatul i birTvis romel ime mdgomareobis dasacavad?

1) nitrirebas; 2) hal ogenirebas; 3) sul firebas;\* 4) hidrirebas.

939. CamoTvl il ebidan romel i mJavas anhidridi miReba benzol is daJangvisas maRal temperaturaze vanadium(V)-is oqsidis Tanaobisas?

1) mal onmJavas; 2) benzomJavas; 3) heqsanmJavas; 4) arcerTis.\*

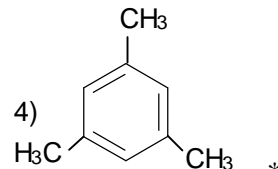
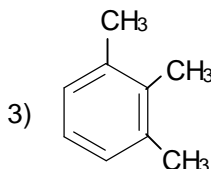
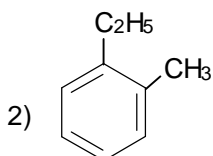
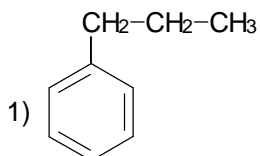
940. qvemoTCamoTvl il Tagan benzol ze romel i reagentis moqmedebiT miReba benzol sul fomJava?

1) koncentrirebul i azotmJava; 2) ol eumi;\*

- 3) gantzavebul i gogirdmJava; 4) gogird(IV)-is oqsidi.
941. benzol idan eTil benzol is miReba SeiZl eba:  
 1) kuCerovis reaqci iT; 2) fridel -kraftsis reaqci iT;\*  
 3) CiCibabinis reaqci iT; 4) konoval ovis reaqci iT.
942. ramdeni naxSirbadia meta-qsil ol is Semadgenl obaSi?  
 1) 6; 2) 7; 3) 8;\* 4) 9.
943. ra rol s asrul ebs koncentrirebul i gogirdmJava benzol is nitrirebisas manitrirebil narevSi?  
 1) mxol od katal izatoris; 2) rogorc katal izatoris, ise wyal wamrTmevis;\*  
 3) manitrirebil narevSi koncentrirebul i gogirdmJava ar Sedis; 4) aranairs.
944. ra pirobebSi miReba benzol idan cikl oheqsani?  
 1) hidrireb iT, katal izatoris Tanaobisas;\* 2) dehidrocikl izaci iT;  
 3) hidrataci iT, katal izatoris Tanaobisas; 4) katal izuri daJangvi T;
945. ras udris naxSirbadatomebs Soris arsebul i bmis sigrZeebi benzol is birTvSi?  
 1) sami bmis – 0.154 nm, samis - 1.34 nm; 2) yvel a 0.134 nm;  
 3) yvel a 0.140 nm;\* 4) sami bmis – 0.120 nm, samis – 0.140 nm.
946. ra pirobebSi miReba tol uol idan kal iumis benzoati?  
 1) Jangbadis gatarebi T, mJava areSi;  
 2) kal iumis tutis damatebi T;  
 3) Jangbadis gatarebi T, neitral ur areSi;  
 4) kal iumis permanganati T daJangvisas neitral ur areSi.\*
947. romel i naerTis radikal s ewodeba benzil i?  
 1) benzol is; 2) eTil benzol is; 3) meTil benzol is;\* 4) dimeTil benzol is.
948. ramdeni naxSirbadia orTo-qsil ol is Sedgenil obaSi  $sp^2$ -hibridizaciis mdgomareobaSi?  
 1) 2; 2) 6;\* 3) 1; 4) 5.
949. ramdeni naxSirbadia para-qsil ol is Sedgenil obaSi  $sp^3$ -hibridizaciis mdgomareobaSi?  
 1) 2;\* 2) 6; 3) 1; 4) 5.
950. ramdeni mol i wyal badia saWiro 1 mol i vinil acetil enis srul i hidrirebisaTvis?  
 1) 1; 2) 2; 3) 3;\* 4) 4.
951. benzol is radikal is saxel wodebaa:  
 1) vinil i; 2) propargil i; 3) fenil i;\* 4) benzil i.
952. benzol is srul i hidrirebis produqtSi naxSirbadatomebis val enturi orbital ebis hibridizaciis tipia:  
 1)  $sp^2$ -; 2)  $sp^3$ -;\* 3)  $sp^2$ - da  $sp^3$ -; 4)  $sp$ -.
- 953 benzosul fomJavas desul fireba xdeba misi urTierTqmedebi T:  
 1) wyal Tan; 2) gadaxurebul wyl is orTql Tan;\*  
 3) wyal badTan; 4) naxSirbadis monoqsidTan.
954. mal einis anhidridi miReba benzol is daJangvisas:  
 1) maRal temperaturaze; 2) maRal wnevaze; 3) maRal temperaturasa da wnevaze; 4) maRal temperaturaze  $V_2O_5$ -is Tanaobisas.\*

955. romel i naerTis daJangvisas mi iReba orfuZiani aromatul i karbonmJava?  
 1) benzol is; 2) tol uol is; 3) qsil ol is; \* 4) eTil benzol is.

956. rogoria  $C_9H_{12}$  Sedgenil obis arenis aRnagoba, Tu misi ql orirebiT SesaZl ebel ia mxol od ori monoql ornawarmis miReba?



957. rogoria naxSirbadatomebis hibridizaciis tipi benzol Si?

1)  $sp^2$ -;\* 2)  $sp^3$ -; 3)  $sp^2$ - da  $sp^3$ -; 4)  $sp$ -.

958.  $C_8H_{10}$  Sedgenil obis izomerul i arenebis ricxvia:

1) 1; 2) 2; 3) 3; 4) 4.\*

959. eTil benzol is izomeria:

1) tol uol i; 2) qsil ol i;\* 3) acetoni; 4) yvel a zemoT CamoTvl il i.

960. rogoria  $C_8H_{10}$  Sedgenil obis naerTis aRnagoba, Tu misi nitirebisas warmoiqmneba mxol od mononitronawarmi?

1) eTil benzol i; 2) orTo-qsil ol i; 3) meta-qsil ol i; 4) para-qsil ol i.

961. rogoria  $C_9H_{12}$  Sedgenil obis naxSirwyal badis aRnagoba, Tu kal iumis permanganatis xsnarit misi daJangvisas warmoiqmneba benzotrikarbonmJava, xol o  $FeBr_3$ -is Tanaobisas bromirebisas – mxol od erTi monobromnawarmi?

1) izopropil benzol i; 2) 1,2,3-trimeTil benzol i;  
 3) 1,2,4-trimeTil benzol i; 4) 1,3,5-trimeTil benzol i.\*

962. rogori meqanizmiT mimdinareobs areneSi Canacvl ebis reaqciebi?

1) radikal uri; 2) el eqtrofil uri;\* 3) nukl eofil uri; 4) ionuri.

963.romel i produqti warmoiqmneba, upiratesad, nitrobenzol is nitirebisas?

1) 1,2-dinitrobenzol i; 2) 1,3-dinitrobenzol i;\*  
 3) 1,4-dinitrobenzol i; 4) 1,2,3-trinitrobenzol i.

964. romel rigSia ganl agebul i nivTierebebi aromatul i birTvis nitirebis reaqciaSi reaqciisunarianobis zrdis mixedviT?

1) benzol i, nitrobenzol i, tol uol i;  
 2) nitrobenzol i, benzol i, tol uol i;\*  
 3) tol uol i, benzol i, nitrobenzol i;  
 4) tol uol i, nitrobenzol i; benzol i.

965. Tanabari mol uri TanafardobiT aRebul i benzol isa da bromis urTierTqmedebiT rkina(III)-is bromidis Tanaobisas mi iReba:

1)  $C_6H_6Br_2$ ; 2)  $C_6H_5Br$ ;\* 3)  $C_6H_4Br_2$ ; 4)  $C_6H_6Br_6$ .

966. ql oris ra maqsimal ur raodenobas SeuZl ia reaqciaSi Sesvl a 1 mol tol uol Tan sinaTI eze?

1) 1 mol s; 2) 2 mol s; 3) 3 mol s;\* 4) 4 mol s.

967. CamoTvl il i naerTebidan romel i aufrul ebs bromian wyal s yvel aze advil ad?

1) benzol i; 2) vinil benzol i; 3) al il benzol i;\*

4) samive naerTi erTnairad reagirebs.

968. romel rigSia ganl agebul i mxol od I rigis Camnacvl ebl ebi?

1)  $-\text{CH}_3$ ; 2)  $-\text{Cl}$ ; 3)  $-\text{NO}_2$ ; 4)  $-\text{OH}$ ;

2)  $-\text{C}_2\text{H}_5$ ; 2)  $-\text{Br}$ ; 3)  $-\text{CHO}$ ; 4)  $-\text{NH}_2$ ;

3)  $-\text{C}_3\text{H}_7$ ; 2)  $-\text{OH}$ ; 3)  $-\text{Cl}$ ; 4)  $-\text{NH}_2$ ; \*

4)  $-\text{C}_3\text{H}_7$ ; 2)  $-\text{OH}$ ; 3)  $-\text{COOH}$ ; 4)  $-\text{NH}_2$ .

969. romel rigSia ganl agebul i mxol od II rigis Camnacvl ebl ebi?

1)  $-\text{CH}_3$ ; 2)  $-\text{Cl}$ ; 3)  $-\text{NO}_2$ ; 4)  $-\text{OH}$ ;

2)  $-\text{C}_2\text{H}_5$ ; 2)  $-\text{Br}$ ; 3)  $-\text{CHO}$ ; 4)  $-\text{NH}_2$ ;

3)  $-\text{C}_3\text{H}_7$ ; 2)  $-\text{OH}$ ; 3)  $-\text{Cl}$ ; 4)  $-\text{NH}_2$ ;

4)  $-\text{NO}_2$ ; 2)  $-\text{CHO}$ ; 3)  $-\text{COOH}$ ; 4)  $-\text{SO}_3\text{H}$ . \*

970. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia meTil is j gufi?

1) 1, 3, 5; \* 2) 1, 2, 3; 3) 2, 4, 6; 4) 2, 4, 5.

971. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia hidroqsil is j gufi?

1) 1, 3, 5; \* 2) 1, 2, 3; 3) 2, 4, 6; 4) 2, 4, 5.

972. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia amino-j gufi?

1) 1, 3, 5; \* 2) 1, 2, 3; 3) 2, 4, 6; 4) 2, 4, 5.

973. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia nitro-j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

974. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia sul fo-j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

975. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis deficiiti, roca benzol is birTvSi Camnacvl ebel ia karboqsil is j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

976. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia meTil is j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

977. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia amino-j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

978. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia hidroqsil is j gufi?

1) 1, 3, 5; 2) 1, 2, 3; 3) 2, 4, 6; \* 4) 2, 4, 5.

979. romel mdgomareobebSi Cndebe el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia nitro-j gufi?

1) 1, 3, 5; \* 2) 1, 2, 3; 3) 2, 4, 6; 4) 2, 4, 5.

980. romel mdgomareobebSi Cndeba el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia al dehidis j gufi?

1) 1, 3, 5; \*            2) 1, 2, 3;            3) 2, 4, 6;            4) 2, 4, 5.

981. romel mdgomareobebSi Cndeba el eqtronul i simkvrivis siWarbe, roca benzol is birTvSi Camnacvl ebel ia sul fo-j gufi?

1) 1, 3, 5; \*            2) 1, 2, 3;            3) 2, 4, 6;            4) 2, 4, 5.

982. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba meta-mdgomareobaSi?

1) -CHO; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

983. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba meta-mdgomareobaSi?

1) -COOH; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

984. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba meta-mdgomareobaSi?

1) -SO<sub>3</sub>H; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

985. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO;    2) -COOH;    3) -NH<sub>2</sub>; \*    4) -SO<sub>3</sub>H.

986. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO;    2) -COOH;    3) -OH; \*    4) -SO<sub>3</sub>H.

987. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi bromireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO;    2) -COOH;    3) -SH; \*    4) -SO<sub>3</sub>H.

988. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba meta-mdgomareobaSi?

1) -CHO; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

989. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba meta-mdgomareobaSi?

1) -COOH; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

990. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba meta-mdgomareobaSi?

1) -SO<sub>3</sub>H; \*    2) -CH<sub>3</sub>;    3) -NH<sub>2</sub>;    4) -OH.

991. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba orTo- da para-mdgomareobaSi?



1) -CHO; 2) -OH; \* 3) -COOH; 4) -SO<sub>3</sub>H.  
992. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO; 2) -CH<sub>3</sub>; \* 3) -COOH; 4) -SO<sub>3</sub>H.  
993. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO; 2) -COOH; 3) -NH<sub>2</sub>; \* 4) -SO<sub>3</sub>H.  
994. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi nitrireba warimarTeba meta-mdgomareobaSi?

1) -CHO; \* 2) -CH<sub>3</sub>; 3) -NH<sub>2</sub>; 4) -OH.  
995. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi nitrireba warimarTeba meta-mdgomareobaSi?

1) -COOH; \* 2) -CH<sub>3</sub>; 3) -NH<sub>2</sub>; 4) -OH.  
996. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi sul fireba warimarTeba meta-mdgomareobaSi?

1) -SO<sub>3</sub>H; \* 2) -CH<sub>3</sub>; 3) -NH<sub>2</sub>; 4) -OH.  
997. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi nitrireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO; 2) -OH; \* 3) -COOH; 4) -SO<sub>3</sub>H.  
998. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi nitrireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO; 2) -CH<sub>3</sub>; \* 3) -COOH; 4) -SO<sub>3</sub>H.  
999. qvemoT CamoTvl il Camnacvl ebel Tagan romel i arsebobs benzol is birTvSi, Tu am ukanasknel is Semdgomi nitrireba warimarTeba orTo- da para-mdgomareobaSi?

1) -CHO; 2) -COOH; 3) -NH<sub>2</sub>; \* 4) -SO<sub>3</sub>H.  
1000. orientaciis wesis mixedviT I rigis Camnacvl ebl ebs mi ekuTvneba:

1) meTil is j gufi; \* 2) karboqsil is j gufi;  
3) sul fo-j gufi; 4) al dehidis j gufi.

1001. orientaciis wesis mixedviT I rigis Camnacvl ebl ebs mi ekuTvneba:

1) hidroqsil is j gufi; \* 2) karboqsil is j gufi;  
3) sul fo-j gufi; 4) al dehidis j gufi.

1002. orientaciis wesis mixedviT II rigis Camnacvl ebl ebs mi ekuTvneba:

1) dimeTil amino-j gufi; 2) eTil is j gufi;  
3) bromis atomi; 4) nitro-j gufi. \*

1003. orientaciis wesis mixedviT II rigis Camnacvl ebl ebs mi ekuTvneba:

1) meTil is j gufi; 2) karboqsil is j gufi; \*  
3) amino-j gufi; 4) ql oris atomi.

