

**1-qism: Har bir topshiriq 0,9 ballardan baholanadi**

1. A – noma'lum oltingugurt oksidi. Uning 1 g ida  $9.406 \cdot 10^{21}$  ta molekula bo'lsa, noma'lum oksidni aniqlang.

- A) SO                      B) SO<sub>2</sub>  
C) SO<sub>3</sub>                     D) SO<sub>4</sub>

2. 1 molekula ozonning (O<sub>3</sub>) massasini aniqlang.

- A) 48 g                      B) 16 g  
C)  $7.97 \cdot 10^{-23}$  g        D)  $2.66 \cdot 10^{-23}$  g

3. Qaysi qatorda Zn<sup>2+</sup> ionining elektron konfiguratsiyasi to'g'ri ko'rsatilgan?

- A)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9 4s^1$                       B)  $1s^2 2p^6 3s^2 3p^6 3d^{10} 4s^0$   
C)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9 4s^2$                       D)  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^0$

4. Oltingugurtning allotropik ko'rinishlaridan birida (S<sub>x</sub>) 8 g oltingugurt na'munasi  $2.508 \cdot 10^{22}$  ta molekula saqlasa, oltingugurt molekulasini formulasini aniqlang.

- A) S<sub>4</sub>                         B) S<sub>6</sub>  
C) S<sub>8</sub>                         D) S<sub>10</sub>

5. 10 l gaz 2 l gacha izotermik (T=const) qisilganda bosim 25 kPa bo'ldi. Dastlabki bosimni aniqlang.

- A) 3 kPa                      B) 5 kPa  
C) 7 kPa                      D) 9 kPa

6. 1.4 g A metal atmosfera azoti bilan reaksiyaga kirishib ( $6A + N_2 = 2A_3N$ ) 2.33 g A<sub>3</sub>N hosil qilgan bo'lsa, A ni aniqlang.

- A) Li                         B) Na  
C) K                         D) Rb

7. 3p, 3d, 4s va 4p energetik pog'onachalarni elektronlar bilan to'lish ketma-ketligida joylashtiring.

- A) 3p, 3d, 4s, 4p        B) 3p, 4s, 3d, 4p  
C) 4p, 4s, 3p, 3d        D) 3d, 3p, 4s, 4p

8. Tabiiy litiy ikki barqaror izotop <sup>6</sup>Li (7.3%) va <sup>7</sup>Li (92.7%) lardan iborat bo'lsa, litiyning atom massasini aniqlang.

- A) 6.727                      B) 6.827  
C) 6.927                      D) 6.967

9.  $N_2 + O_2 = 2NO$  reaksiya uchun to'g'ri reaksiyaga massalar ta'siri qonunini ko'rsating.

- A)  $v_{to'g'ri} = k [N_2][O_2][NO]^2$     B)  $v_{to'g'ri} = k [N_2][O_2]$   
C)  $v_{to'g'ri} = k [NO]^2$                       D)  $v_{to'g'ri} = k [N_2][NO]^2$

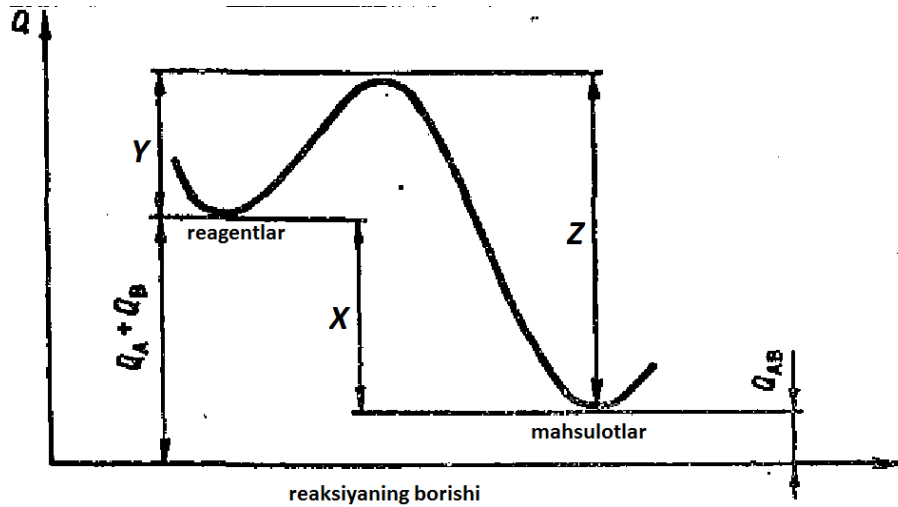
10. 0.1 g natriy gidroksid saqlovchi 1 dm<sup>3</sup> eritmaning vodorod ko'rsatkichini (pH) hisoblang. Ishqorni to'liq dissotsiyatsiyalanadi deb qarang.

- A) 2.6                         B) 3.6  
C) 11.4                        D) 10.4



**2-qism: Har bir topshiriq 1,5 ballardan baholanadi**

11. Quyida  $\{A + B = AB\}$  reaksiyaning energetik profili keltirilgan:



Diagrammadagi noma'lum harflar nimani bildiradi, mos variantlarni tanlang	Variantlar	
X	A	To'g'ri reaksiyaning aktivlanish energiyasi
Y	B	Teskari reaksiyaning aktivlanish energiyasi
Z	C	Reaksiyaning issiqlik effekti

- A) X-C, Y-A, Z-B                      B) X-B, Y-A, Z-C  
C) X-C, Y-B, Z-A                      D) X-A, Y-B, Z-C

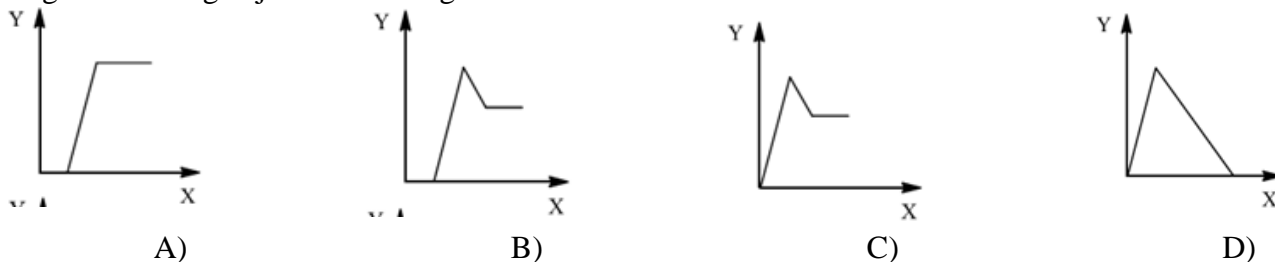
12. Quyidagi qatorda kislotalar kuchi oshib borishi ketma-ketligini ko'rsating:  $\text{ClH}_2\text{CCOOH}$ ,  $\text{Cl}_2\text{HCCOOH}$ ,  $\text{Cl}_3\text{CCOOH}$

- A)  $\text{ClH}_2\text{CCOOH} < \text{Cl}_2\text{HCCOOH} < \text{Cl}_3\text{CCOOH}$                       B)  $\text{ClH}_2\text{CCOOH} < \text{Cl}_3\text{CCOOH} < \text{Cl}_2\text{HCCOOH}$   
C)  $\text{Cl}_3\text{CCOOH} < \text{Cl}_2\text{HCCOOH} < \text{ClH}_2\text{CCOOH}$                       D)  $\text{Cl}_3\text{CCOOH} < \text{ClH}_2\text{CCOOH} < \text{Cl}_2\text{HCCOOH}$

13. Bor modeliga ko'ra vodorod atomidagi elektronning energiyasi quyidagicha aniqlanadi:  $E = \frac{-13,6}{n^2}$  (eV), bu yerda  $n = 1, 2, 3, \dots$  va h.k. butun sonlar. Bor modeliga ko'ra elektronni 1-orbitadan ( $n = 1$ ) 5-orbitaga ( $n = 5$ ) o'tkazish uchun qancha energiya (eV) talab qilinadi?

- A) 13,06                      B) 10,2  
C) 13,6                      D) 40,8

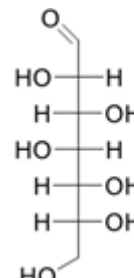
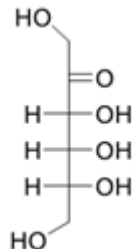
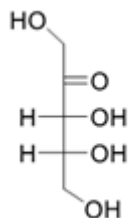
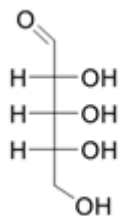
14. NaOH eritmasi  $\text{H}^+$ ,  $\text{Mg}^{2+}$  va  $\text{Al}^{3+}$  ionlarini saqlagan rangsiz eritmaga tomchilatib qo'shildi. Hosil bo'layotgan cho'kma massasi (Y o'qda) ning sarflangan NaOH eritmasi hajmi (X o'qda) ga bog'liqligi to'g'ri ko'rsatilgan javobni tanlang.



15.  $2\text{O}_3(\text{g}) \rightarrow 3\text{O}_2(\text{g})$  reaksiyasida kislorodning hosil bo'lish tezligi  $3,0 \cdot 10^{-7} \text{ mol}/(\text{dm}^3 \cdot \text{s})$ . Ozonning sarflanish tezligi qanday  $\text{mol}/(\text{dm}^3 \cdot \text{s})$ ?

- A)  $1,6 \cdot 10^{-10}$       B)  $3,0 \cdot 10^{-7}$   
C)  $2,0 \cdot 10^{-7}$       D)  $4,5 \cdot 10^{-7}$

16. Quyidagi birikmalardan qay biri piranoza formasida mavjud bo'la olmaydi?



- A)                                      B)                                      C)                                      D)

17. DNK yarimkonservativ replikatsiyaga uchraydi, ya'ni har bir zanjir alohida ko'payadi va yangi DNK molekulasiga aylanadi. Yangi zanjirlarni  $^{14}\text{N}$  yoki  $^{15}\text{N}$  saqlovchi substartlar ishtirokida hosil qilish mumkin. Tajribada bir zanjiri faqat  $^{14}\text{N}$ , ikkinchi zanjiri esa faqat  $^{15}\text{N}$  tutuvchi DNK (gibrid DNK) ishlatildi. Gibrid DNK  $^{14}\text{N}$  saqlovchi substrat ishtirokida replikatsiya qilindi. Agarda tajriba boshida bitta gibrid DNK molekulasiga bo'lgan bo'lsa, 4 ta replikatsiya siklididan so'ng  $^{15}\text{N}$  tutadigan ikkizanjirli molekulaning ulushini toping.

- A)  $\frac{1}{4}$                                       B)  $\frac{1}{8}$   
C)  $\frac{1}{16}$                                     D)  $\frac{1}{32}$

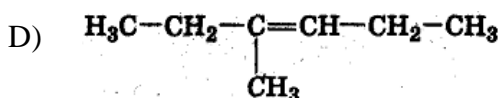
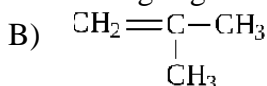
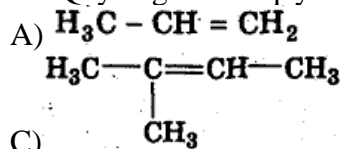
18. Berilgan tartibda elementlarning oxirgi elektroni uchun orbital kvant sonining qiymati qanday o'zgaradi (elementning tartib raqamlari berilgan)?  $11^1 \rightarrow 17^2 \rightarrow 3^3 \rightarrow 18$       a) ortadi b) kamayadi c) o'zgarmaydi

- A) 1-a, 2-b, 3-a.                      B) 1-b, 2-b, 3-a.  
C) 1-a, 2-b, 3-b.                      D) 1-a, 2-b, 3-c.

19. Ma'lum reaksiyaning temperatura koeffisienti 2.5 ga teng. Shu reaksiya temperaturasi  $20^\circ\text{C}$  dan  $45^\circ\text{C}$  gacha oshirilganda reaksiya tezligi qanday o'zgaradi?

- A) 2.5 marta oshadi                      B) 9.88 marta oshadi  
C) 61.76 marta oshadi                    D) 2.5 marta kamayadi

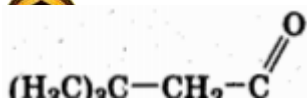
20. Quyidagilardan qay biri sis-trans-izomerlarga ega?



**3-qism: Har bir topshiriq 2,6 balldan baholanadi**

21. Arxeologlar yog'ochdan ishlangan jihoz na'munasini aniqlashdi. Undagi uglerod-14 izotopining miqdori hozirgi vaqtda Yerda o'suvchi daraxtlardagiga nisbatan 75 % ni tashkil etdi. Aniqlangan jihozning yoshini aniqlang.  $t_{1/2} (^{14}\text{C}) = 5730$  yil.

22. Quyidagi tuzni ishqor bilan qizdirilganda hosil bo'lgan uglevodorodni nomlang:



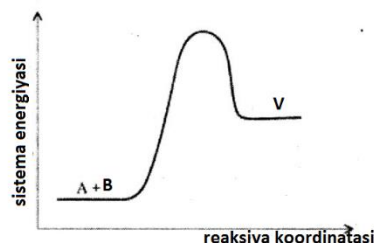
... i bo'yicha iqtidorli o'quvchilar bilan ishlash departamenti

23. Bor modeliga ko'ra vodorod atomidagi elektronning energiyasi quyidagicha aniqlanadi:  $E = \frac{-13,6}{n^2}$  (eV), bu yerda  $n = 1, 2, 3, \dots$  va h.k. butun sonlar. Bor modeliga ko'ra elektronni 1-orbitadan ( $n = 1$ )  $\infty$ (cheksizinchi)-orbitaga ( $n = \infty$ ) o'tkazish uchun qancha energiya (eV) talab qilinadi?

24. Propandagi barcha kovalent bog'larni uzish uchun 4006 kJ/mol energiya kerak bo'ladi, n-pentandagi barcha kovalent bog'larni uzish uchun esa 6356 kJ/mol energiya kerak. C-C bog' o'rtacha energiyasini aniqlang, kJ/mol da.

25. Fosfat kislota quyidagi dissotsiyalanish konstantalariga ega:  
 $pK_{1a} = 2.12$      $pK_{2a} = 7.21$      $pK_{3a} = 12.32$   
Digidrofosfat ioni uchun asoslik konstantasini hisoblang.

26. Agar  $A + B \rightarrow V$  reaksiyaning energetik diagrammasi o'ng tomondagi sur'atda ifodalangan bo'lsa, uning ekzotermik yoki endotermik ekanligini aniqlang.



27. 20 g noma'lum metall xlorid kislota eritmasi bilan ta'sirlashganida 6.85 litr (n.sh.da) vodorod ajralib chiqqan bo'lsa, noma'lum metallni aniqlang.

28.  $xS_2O_3^{2-} + yI_2 \rightarrow zS_4O_6^{2-} + 2I^-$  yarim-reaksiyadagi x,y,z koeffisientlarni aniqlang. (Javob faqat barcha koeffisientlar to'g'ri bo'lsagina inobatga olinadi)

29.  ${}_{91}Pa \rightarrow {}_{82}Pb + x{}^4_2\alpha + y{}^0_{-1}\beta$ . Protaktiniy izotopi parchalanganda 41.6 mg qo'rg'oshin va  $6.02 \cdot 10^{20}$  dona elektron hosil bo'ldi. Protaktiniy izotopidagi neytronlar sonini toping (Pa neytronlari soni Pb nikidan 19 taga ko'p).

30. Gaz fazasida kechadigan  $X_2 + 2Y_2 \rightarrow 2XY_2$  reaksiyaning tezligi bosim 6 marta oshirilganda qanday o'zgaradi?

