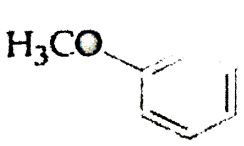
CHEMISTRY

BOOKS - JEE MAINS PREVIOUS YEAR

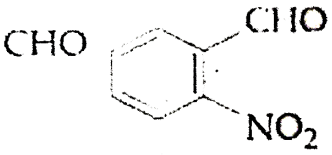
JEE MAINS 2020

Chemistry

1. The increasing order of the following compounds towards HCN addition is:



(i)



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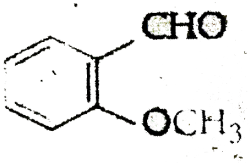

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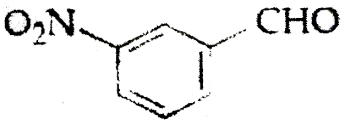

(iv)

A. $(i) < (iii) < (ii)$

B. $(iii) < (i) < (iv) < (ii)$

C. $(iii) < (iv) < (i) < (ii)$

D. $(iii) < (iv) < (ii) < (i)$

Answer:

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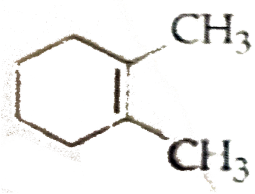
2. The major product in the following reaction is

A.



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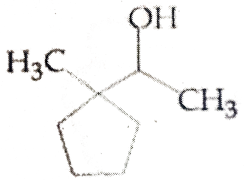
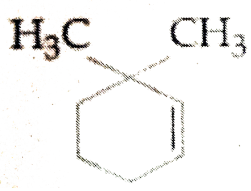
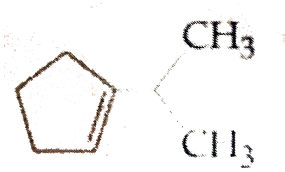


C.



D.



Answer:

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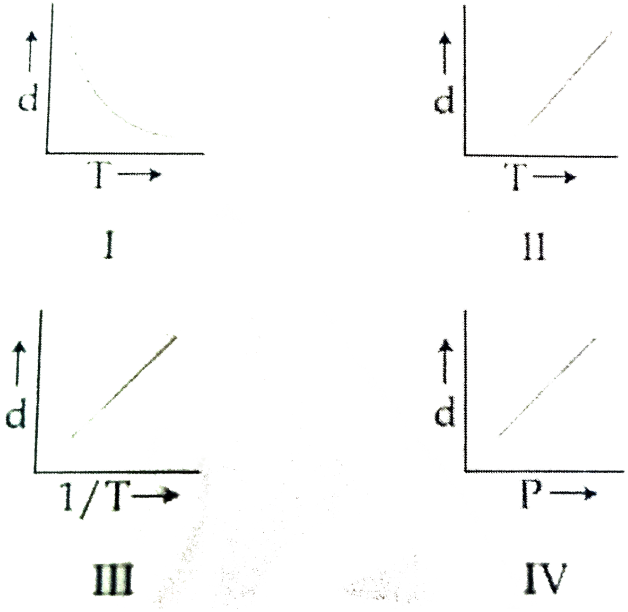
3. which one of the following graph is not correct for ideal gas ?



d=density ,P=pressure,T=Temperature

A. IV

B. III

C. I

D. II

Answer:

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4. The IUPAC name for the following compund is :

A. 2,5-dimethyl -5-carboxy-hex-3-enal

B. 2,5-dimethyl1-6-carboxy-hex-3-enal

C. 2,5-dimethyl-6-oxo-hex-3-enoic acid

D. 6-formly 1-2 mehtyl-hex-3-enoic acid

Answer:

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5. Which metal is used in devising Photo-chemical cell?

A. Li

B. Na

C. Cs

D. Rb

Answer:

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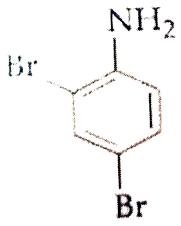
6. In carius method of estimation of halogen 0.172 g of an organic comound showed presence of 0.08 g of bromine.which of the compound ?

A. $H_3C - Br$

B. 

C. 

D. $H_3C - CH_2 - Br$

Answer:

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7. While titrating dilute HCI solution with aqueous NaOH,which of the following will not be required

A. Burette and porcelain stand

B. pipette and distilled water

C. Bunsen burner and measuring cylinder

D. Clamp and phenolthalein

Answer:

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8. For octahedral Mn(II) and tetrahedral Ni(II) complexes,consider the following statements:

(I) Both the complexes can be high spin

(ii) Ni(II)complex can be ery rarely be low spin

(iii) With strong field ligands ,Mn (II) complexes can be low spin

(iv) aqueous solution of Mn(II) ions is yellow in colour .

A. (I) and (II) only

B. (I),(II) and (III) only

C. (II),(IIIand (IV)only

D. (I),(III)and (IV)only

Answer:

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9. In general ,the property (magnitudes only)that shows an opposite trend In comparision to other properties across a period is :

A. Ionization enthalpy

B. Electrongativity

C. electron gain enthalpy

D. Atomic radius

Answer:

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10. Consider the following reactions :

(i)Gluscose+ROH $\xrightarrow{dryHCl}$ Acetal

$\xrightarrow[(CH_3CO)_2O]{\text{xeq. Of}}$ acetyl derivative

(ii) Glucose

$\xrightarrow{Ni/H_2} A \xrightarrow[(CH_3CO)_2O]{\text{y eq. of}}$ acetyl

(iii) Glucose $\xrightarrow[(CH_3CO)_2O]{\text{Z eq.of}}$ acetyl derivative

'x','y' and 'z' in these reactions are respectively.

A. 4,5 &5

B. 5,4,&5

C. 5,6& 5

D. 4,6 & 5

Answer:

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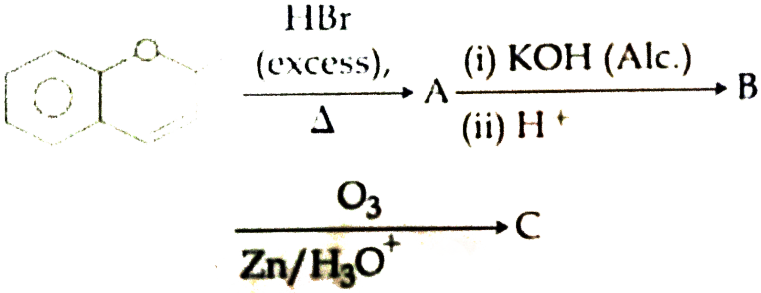
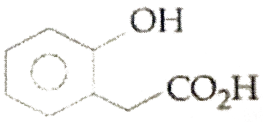
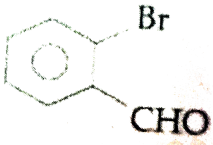
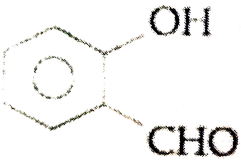
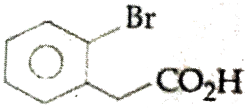
11. The major aromatic product C in the following reaction sequence will be :



A. 

B. 

C. 

D. 

Answer:

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12. On heating compound (A) gives a gas (B) which is a constituent of air . This gas when treated H_2 in the presence of a catalyst gives another gas (C) which is basic in nature. (A) should not be :

A. $Pb(NO_3)_2$

B. NH_4NO_2

C. NaN_3

D. $(NH_4)_2Cr_2O_7$

Answer:

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13. For the following Assertion and Reason , the correct option is

Assertion (A) : When Cu (II) and sulphide ions are mixed , they react together extremely quickly to give a solid .

Reason (R) : The equilibrium constant of $Cu^{2+}(aq) + S^{2-}(aq) \Leftrightarrow CuS(s)$ is high because the solubility product is low .

A. Both (A) and (R) are false

B. (A) is false and (R) is true

C. Both (A) and (R) are true and (R) is the explanation for (A).

D. Both (A) and (R) are true and (R) is not the explanation for (A).

Answer:

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14. Consider that a d^6 metal ion $\left(M^{2+}\right)$ forms a complex with aqua ligands , and the spin only magnetic moment of the complex is 4.90 BM . The geometry and the crystal field stabilization energy of the complex is :

A. octahedral and $-2.4\Delta_0 + 2P$

B. tetrahedral and $-0.6\Delta_t$

C. octahedral and $-1.6\Delta_0$

D. tetrahedral and $-1.6\Delta_t + 1P$

Answer:

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15. The statement that is not true about ozone is :

A. it is a toxic gas and its reaction with NO gives NO_2 . In the stratosphere , CFCs release

B. chlorine free radicals (Cl) which reacts with O_3 to give chlorine dioxide radicals .

C. in the stratosphere , it forms a protective shield against UV radiation .

D. in the atmosphere , it is depleted by CFCs.

Answer:

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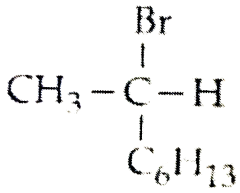
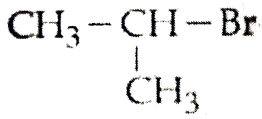
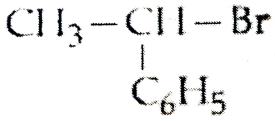
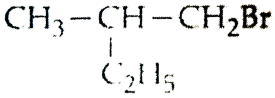
16. Which of the following compound will show retention in configuration on nucleophic substitution by OH^- ion ?

A. 

B. 

C. 

D. 

Answer:

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17. If AB_4 molecule is a polar molecule , a possible geometry of AB_4 is

:

A. Rectangular planar

B. Tetrahedral

C. Square pyramidal

D. Square planar

Answer:

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18. Which of the following is used for the preparation of colloids ?

A. Ostwald Process

B. Van Arkel Method

C. Bredig's Arc Method

D. Mond Process

Answer:

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19. An open beaker to water in equilibrium with water vapour is in a sealed container . When a few grams of glucose are added to the beaker of water , the rate at which water molecules :

A. leaves the solution decreases

B. leaves the vapour increases

C. leaves the vapour decreases

D. leaves the solution increases

Answer:

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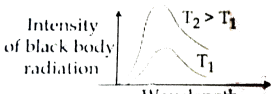
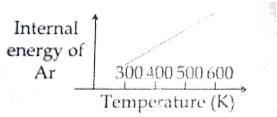
20. The figure that is not a direct manifestation of the quantum nature of atom is :

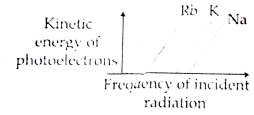
A.



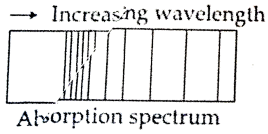
B.



C.



D.



Answer:

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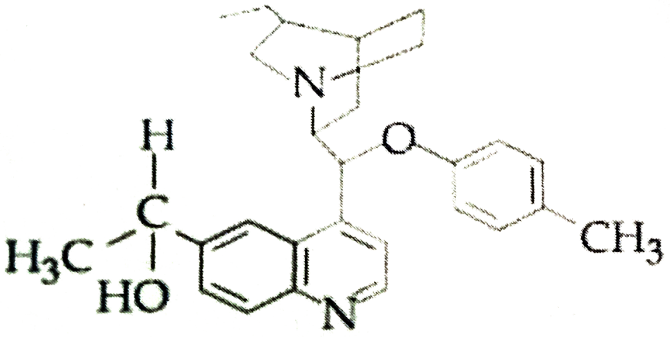
21. The number of chiral carbons present in he molecule given below is

_____ .



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22. The mass of gas adsorbed , x , per unit mass of adsorbate , m , was measured at various pressures , p . A graph between log $\frac{x}{m}$ and log p gives a straight line with slope equal to 2 and the intercept equal to 0.4771 .The value of $\frac{x}{m}$ at a pressure of 4 atm is : (Given log 3 = 0.4771)

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23. The Gibbs energy change (in J) for the given reaction at $\left[Cu^{2+}\right] = \left[Sn^{2+}\right] = 1$ M and 298 K is :

$Cu(s) + Sn^{2+}(aq) \rightarrow Cu^{2+}(aq.) + Sn(s)$,

$\left(E^0_{Sn^{2+}/Sn} = -0.16V E^0_{Cu^{2+}|Cu} = 0.34V,\right.$ Take F = 96500 C $\left.mol^{-1}\right)$

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24. The internal energy change (in J) when 90 g of water undergoes complete evaporation at $100^\circ C$ is _____ .

(Given : ΔH_{vap} for water at 373 K = 41 kJ/ mol , $R = 8.314 JK^{-1}mol^{-1}$)

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25. The oxidation states of iron atoms in compounds (A) ,(B) and (C) , respectively , are x , y and z . The sum of x , y and z is _____

$\underset{(A)}{Na_4\left[Fe(CN)_5(NOS)\right]}$ $\underset{(B)}{Na_4[FeO_4]}$ $\underset{(C)}{\left[Fe_2(CO)_9\right]}$

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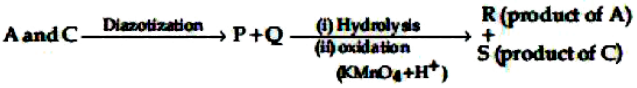
26. Three isomers A, B and C (mol. Formula $C_8H_{11}N$) give the following results :

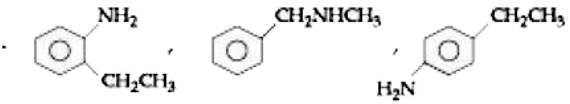


R has lower boiling point than S

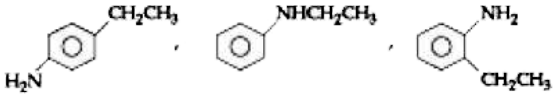
$B \xrightarrow{C_6H_5SO_2Cl}$ alkali -insoluble product

A,B and C, respectively are

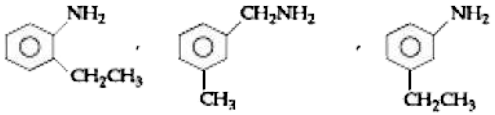
A.



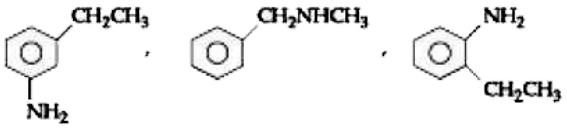
B.



C.



D.



Answer:

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27. The strengths of 5.6 volume hydrogen peroxide (of density 1g/ mL) in terms of mass percentage and molarity (M) , respectively are :

(Take molar mass of hydrogen peroxide as 34g / mol)

A. 1.7 and 0.5

B. 0.85 and 0.5

C. 0.85 and 0.25

D. 1.7 and 0.25

Answer:

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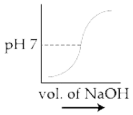
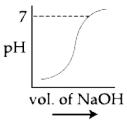
28. 100 mL of 0.1 HCl is taken in a beaker and to it 100 mL of 0.1 M NaOH is added in steps of 2ml and the pH is continuously measured . Which of the following graphs correctly depicts the change in pH

A.



B.



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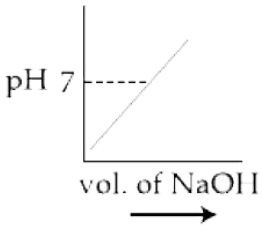

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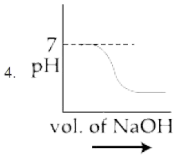

Answer:

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29. Write down decreasing order of nucleophilic addition reaction of following

Propanal, Butanone, Propanone, Benzaldehyde

A. benzaldehyde $<$ butanone $<$ propane $<$ propanal

B. propanal $<$ propanal $<$ butanone $<$ benzaldehyde

C. butanone $<$ propanone $<$ benzaldehyde $<$ propanal

D. benzaldehyde $<$ propanal $<$ propanone $<$ butanone

Answer:

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30. Which of the following statements are incorrect statements for acid rain (A) it corrodes water pipes (B) it is not harmful for trees and plants (C) it does not cause breathing problem in human being and

animals (D) it damages building and other structures made of stone or metal

A. c only

B. c and d

C. a,c and d

D. a, b and d

Answer:

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31. Consider the hypothetical situation where the azimuthal quantum number , l,takes values 0, 1, 2, ...n+1 , where n is the principal quantum number . Then the element with atomic number :

A. 9 is the first alkali metal

B. 8 is the first noble gas

C. 13 has a half - filled valence subshell

D. 6 has a 2p valence subshell

Answer:

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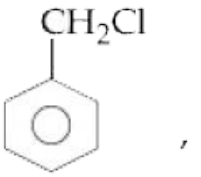
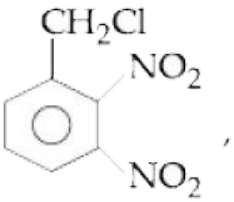
32. The decreasing order of reactivity of the following compound towards nucleophilic substitution (S_N2) is



(I)



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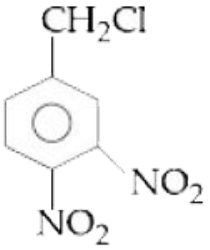

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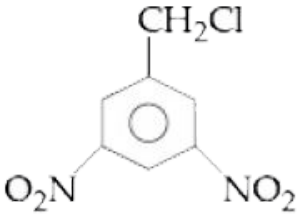

(IV)

-

A. $(IV) > (II) > (III) > (I)$

B. $(II) > (III) > (I) > (IV)$

C. $(II) > (III) > (IV) > (I)$

D. $(III) > (II) > (IV) > (I)$

Answer:

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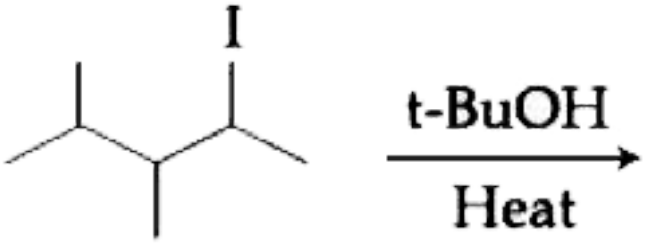
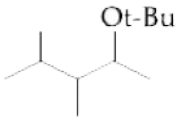
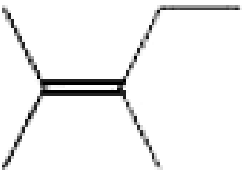
33. The major product in the following reaction is



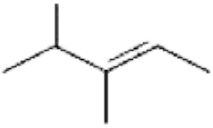
A.



B.



C.



D.

Answer:

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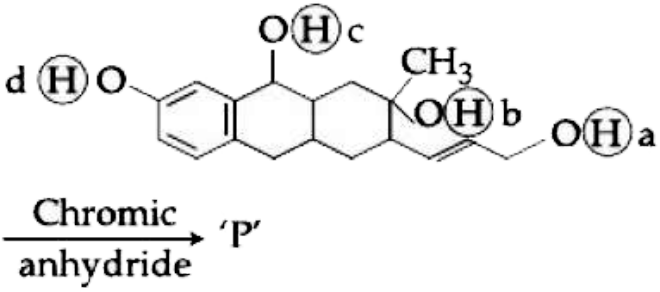
34. Consider the following reaction :



The product 'P' gives positive caric ammonium nitrate test. This is because of the presence of the which of these -OH group ?

A. b and d

B. b only

C. d only

D. c and d

Answer:

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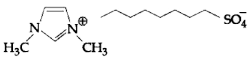
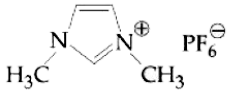
35. An ionic micelle is formed on the addition of :

A. 

B. 

C. sodium stearate to pure toluene

D. liquid diethyl ether to aqueous NaCl solution

Answer:

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36. The d electron configuration of $\left[Ru(en)_3\right]Cl_2$ and $\left[Fe(H_2O)_6\right]Cl_2$, respectively are :

A. $t_{2g}^4 e_g^2$ and $t_{2g}^4 e_g^2$

B. $t_{2g}^6 e_g^0$ and $t_{2g}^6 e_g^0$

C. $t_{2g}^4 e_g^2$ and $t_{2g}^6 e_g^0$

D. $t_{2g}^6 e_g^0$ and $t_{2g}^4 e_g^2$

Answer:

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37. Among the statements (I -IV) , the correct ones are :

(I) Be has smaller atomic radius compared to Mg.

(II) Be has higher ionization enthalpy than Al.

(III) Charge/ radius ratio of Be is greater than that of Al.

(IV) Both Be and Al form mainly covalent compounds.

A. (I) , (III) and (IV)

B. (I), (II) and (IV)

C. (I) ,(II) and (III)

D. (II), (III) and (IV)

Answer:

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38. The five successive energies of an element are $800, 2427, 3658, 25024$ and $32824 kJ mol^{-1}$ respectively. The number

of valence electron is

A. 4

B. 3

C. 2

D. 5

Answer:

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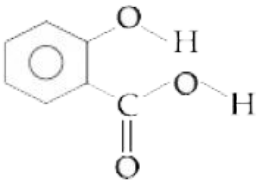
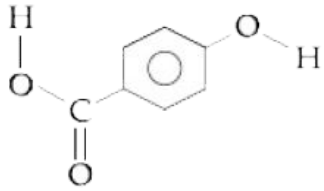
39. Consider the following molecules and statements related to them :

(A) 

(B) 

(B) is move likely to be crystalline than (A)

(B) has higher boiling point than (A)

(B) dissolves more readily than (A) in water

Identify the correct option from below :

A. (a) and (c) are true

B. (b) and (c) are true

C. only (a) is true

D. (a) and (b) are true

Answer:

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40. Match the following drugs with their therpeutic actions :

(i)	Ranitidine	(a)	Antidepressant
(ii)	Nardil (Phenelzine)	(b)	Antibiotic
(iii)	Chloramphenicol	(c)	Antihistamine
(iv)	Dimetane (Brompheniramine)	(d)	Antacid
		(e)	Analgesic

A. (i)-(d) , (ii)-(c) , (iii)-(a) , (iv)-(e)

B. (i)-(a) , (ii)-(c) , (iii)-(b) , (iv)-(e)

C. (i)-(d) , (ii)-(a) , (iii)-(b) , (iv)-(c)

D. (i)-(e) , (ii)-(a) , (iii)-(c) , (iv)-(d)

Answer:

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41. The incorrect statement is :

A. Manganate and permanganate ions are paramagnetic

B. In manganate and permanganate ions , the π-bonding kes place by overlap of p-orbitals of oxygen and d-orbitals of manganese.

C. Manganate and permanganate ions are tetrahedral

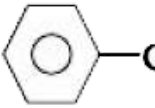
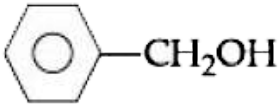
D. Manganate ion is green in colour and permanganate ion is purple in colour

Answer:

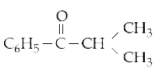
42. The compound A in the following reactions is :

$$A \xrightarrow[\text{(ii) Conc. } H_2SO_4/\Delta]{\text{(i) } CH_3MgBr/H_2O}$$

$$B \xrightarrow[\text{(ii) } Zn/H_2O]{\text{(i) } O_3} C + D$$

$$C \xrightarrow[\text{(ii) } \Delta]{\text{(i) Conc.KOH}} \text{  } + \text{  }$$

$$D \xrightarrow[\Delta]{Ba(OH)_2} H_3C-\overset{CH_3}{\overset{|}{C}}=CH-\overset{O}{\overset{||}{C}}-CH_3$$

A. 

B. $C_6H_5-\overset{O}{\overset{||}{C}}-CH_2CH_3$

C. $C_6H_5-\overset{O}{\overset{||}{C}}-CH_3$

D. $C_6H_5-CH_2-\overset{O}{\overset{||}{C}}-CH_3$

Answer:

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43. Complex A has a composition of $H_{12}O_6Cl_3Cr$. If the complex on treatment with conc. H_2SO_4 loses 13.5 % of its original mass, the correct molecular formula of A is :

[Given : atomic mass of Cr=52 amu and Cl= 35 amu]

A. $\left[Cr(H_2O)_5Cl\right]Cl_2 \cdot H_2O$

B. $\left[Cr(H_2O)_3Cl_3\right] \cdot 3H_2O$

C. $\left[Cr(H_2O)_6\right]Cl_3$

D. $\left[Cr(H_2O)_4Cl_2\right]Cl \cdot 2H_2O$

Answer:

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44. A mixture of one mole of each of $O_2(g)$, $H_2(g)$, He(g) exists in a container of volume V at temperatureT in which partial pressure of H_2 (g) is 2atm. the total pressure in the container is:

A. 6 atm

B. 38 atm

C. 22 atm

D. 14 atm

Answer:

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45. For the reaction $2A + 3B + \frac{3}{2}C \rightarrow 3P$ the correct relation between rate of reaction of species A,B,C is

A. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

B. $\frac{dn_A}{dt} = \frac{3}{2}\frac{dn_B}{dt} = \frac{3}{4}\frac{dn_C}{dt}$

C. $\frac{dn_A}{dt} = \frac{2}{3}\frac{dn_B}{dt} = \frac{4}{3}\frac{dn_C}{dt}$

D. $\frac{dn_A}{dt} = \frac{dn_B}{dt} = \frac{dn_C}{dt}$

Answer:

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46. 6.022×10^{22} molecules are present in 10 g of a substance 'x' . The molarity of a solution containing 5 g of substance 'xx in 2 L solution is _____ $\times 10^{-3}$.

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47. If $250cm^3$ of an aqueous solution containing 0.73 g of a protein A of isotonic with one litre of another aqueous solution containing 1.65 g of a protein B, at 298 K, the ratio of the molecular masses of A and B is _____ $\times 10^{-2}$ (to the nearest integer).

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48. The volume (in mL) of 0.1 N NaOH required to neutralise 10 mL of 0.1 N phosphinic acid is _____

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49. An acidic solution of dichromate is electrolyzed for 8 minutes using 2A current. As per the following equation

$$Cr_2O_7^{2-} + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$$

The amount of Cr^{3+} obtained was 0.104 g. The efficiency of the process (in %) is (Take : F= 96000 C, At. mass of chromium = 52) _____.

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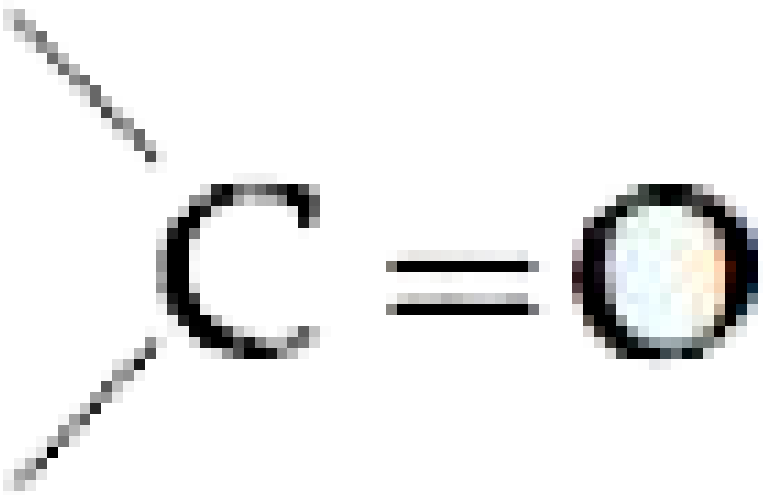
50. The number of



groups

present in a tripeptide Asp-Glu- Lys is _____.

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51. Elements with atomic no. 101,104 belongs to group respectively?

A. Actinoids and Group 4

B. Actinoids and Group 6

C. Group 6 and Actinoids

D. Group 11 and Group 4

Answer: C

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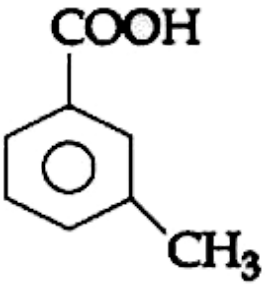
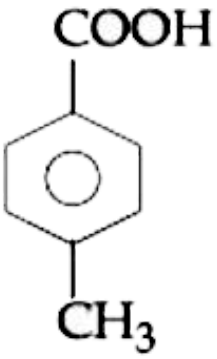
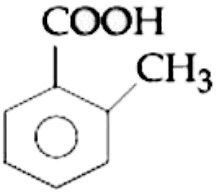
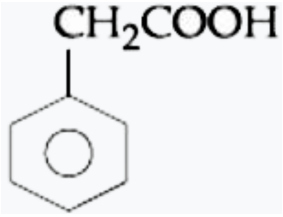
52. [P] on treatment with $Br_2/FeBr_3$ in CCl_4 produced a single isomer $C_8H_7O_2Br$ while heating [P] with sodalime gave toluene The compound [P] is

A.



B. 

C. 

D. 

Answer:

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53. Balmer series lies in which region of electromagnetic spectrum

A. Infared

B. Ultraviolet

C. Microwave

D. Visible

Answer: B

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54. The number of possible isomers $\left[Pt(en)(NO_2)_2\right]$

A. 3

B. 2

C. 4

D. 1

Answer: B

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55. Lead nitrate on heating gives A, A on cooling give B, NO with B give C(blue solid). Find oxidation no of N in compound C

A. $+5$

B. $+4$

C. $+2$

D. $+3$

Answer:

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56. The combustion of Li, Na, K in excess of air gives major oxides

A. Li_2O, Na_2O and K_2O_2

B. Li_2O, Na_2O_2 and K_2O

C. Li_2O, Na_2O_2 and KO_2

D. Li_2O_2, Na_2O_2 and K_2O_2

Answer: D

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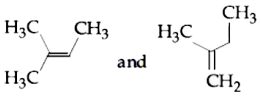
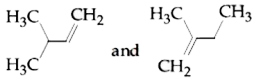
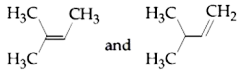
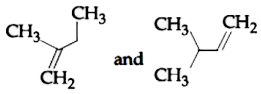
57. When neopentyl alcohol is heated with an acid , it slowly converted into an 85 : 15 mixture of alkenes A and B , respectively. What are these alkenes ?

A. 

B. 

C. 

D. 

Answer: A

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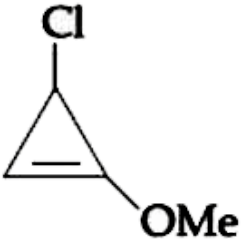
58. The decreasing order of reactivity of the following organic molecules towards $AgNO_3$ solution is

(A)



(B)

$CH_3\underset{\underset{Cl}{|}}{C}HCH_3$
(C)

$CH_3\underset{\underset{Cl}{|}}{C}HCH_2NO_2$
(D)

A. $(A) > (B) > (C) > (D)$

B. $(C) > (D) > (A) > (B)$

C. $(B) > (A) > (C) > (D)$

D. $(A) > (B) > (D) > (C)$

Answer: B

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59. Among statements (a) - (d) , the correct ones are

(a) Lime stone is decomposed to CaO during the extraction of iron from its oxides

(b) In the extraction of silver , silver is extracted as an anionic complex.

(c) Nickel is purified by Mond's process .

(d) Zr and Ti are purified by Van Arkel method .

A. (a), (b), (c) and (d)

B. (a), (c) and (d) only

C. (c) and (d) only

D. (b), (c) and (d) only

Answer:

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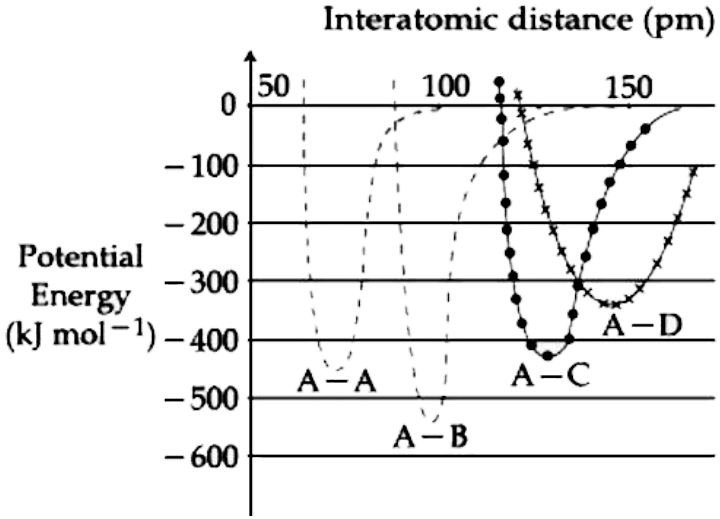
60. The intermolecular potential energy for the molecules A, B, C and D given below suggests that :



A. A - B has the stiffest bond.

B. D is more electronegative than other atoms

C. A - A has the largest bond enthalpy.

D. A - D has the shortest bond length.

Answer: B

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61. What are the functional groups present in the structure of maltose ?

A. One ketal and one hemiketal

B. One acetal and one ketal

C. One acetal and one hemiacetal

D. Two acetals

Answer: C

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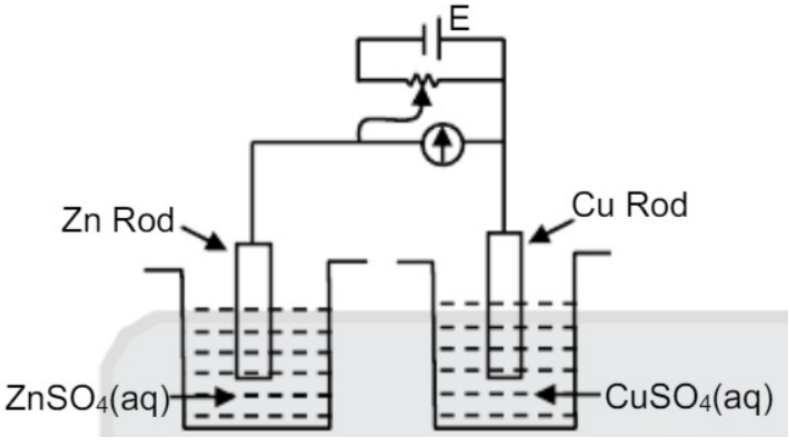
62. For the given cell arrangement identify incorrect statement given $E^{\circ}\_\left(Cu^{2+}/Cu\right)$ = 0.34V &$E^{\circ}\_\left(Zn^{2+}/Zn\right) = -0.76V$



A. If $E_{ext} >$ 1.1 V , Zn dissolves at Zn

electrode and Cu deposits at Cu electrode

B. If $E_{ext} = 1.1V$, no flow of e^0 or current occurs

C. If $E_{ext} > 1.1V$, e^- flows from Cu to Zn

D. If $E_{ext} < 1.1$ V , Zn dissolves at anode and Cu deposits at

cathode

Answer: A

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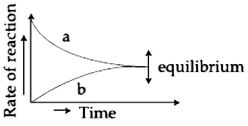
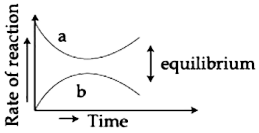
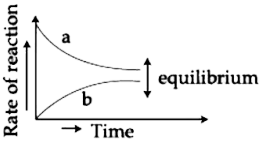
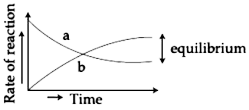
63. For the equilibrium $A \Leftrightarrow B$, the variation of the rate of the forward (a) and reverse (b) reaction with time is given by :

A. 

B. 

C. 

D. 

Answer: A

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64. The ionic radii of O^{2-} , F^{-} , Na^{+} and Mg^{2+} are in the order :

A. $O^{2-} > F^{-} > Mg^{2+} > Na^{+}$

B. $Mg^{2+} > Na^{+} > F^{-} > O^{2-}$

C. $O^{2-} > F^{-} > Na^{+} > Mg^{2+}$

D. $F^{-} > O^{2-} > Na^{+} > Mg^{2+}$

Answer: C

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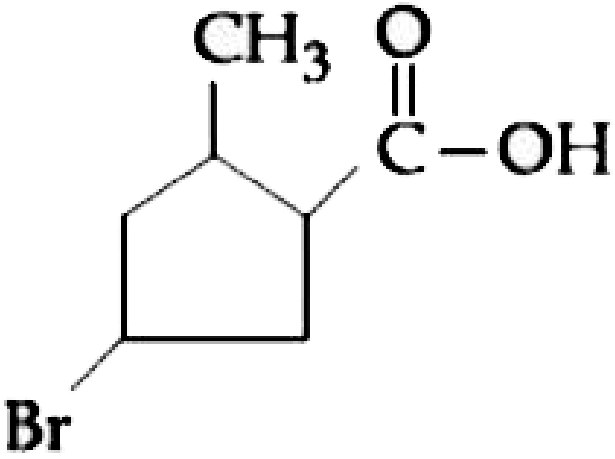
65. The IUPAC name of the following compound is



A. 3 - Bromo - 5- methylcyclopentane carboxylic acid

B. 3 - Bromo - 5- methylcyclopentanoic acid

C. 5 - Bromo - 3- methylcyclopentanoic acid

D. 4 - Bromo - 2- methylcyclopentane carboxylic acid

Answer: B

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66. For one mole of an ideal gas, which of these statements must be true ?

(a) U and H each depends only on temperature

(b) Compressibility factor x is not equal to 1

(c) $C_{p,m} - C_{V,m} = R$

(d) $du = C_V dT$ for any process

A. (b), (c) and (d)

B. (a) and (c)

C. (a),(c) and (d)

D. (c) and (d)

Answer:

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67. The pair in which both species have same magnetic moment (spin only value) is .

A. $[Mn(H_2O_6)]^{2+}$ and $\left[Cr(H_2O]^{2+}\right.$

B. $\left[Cr(H_2O_6\right]^{2+}$ and $\left[Fe(H_2O)_6\right]^{2+}$

C. $\left[Co(OH)_4\right]^{2-}$ and $\left[Fe(NH_3)_6\right]^{2+}$

D. $\left[Cr(H_2O)_6\right]^{2+}$ and $[CoCl_4]^{2-}$

Answer:

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68. Which of the following will react with $CHCl_3 + alc.$ KOH ?

A. Adenine and lysine

B. Thymine and proline

C. Adenine and thymine

D. Adenine and proline

Answer: C

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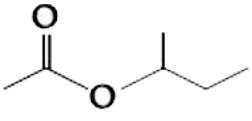
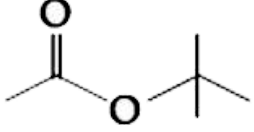
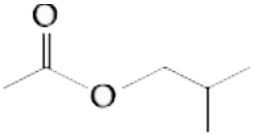
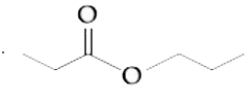
69. An organic compound (A) (molecular formula $C_6H_{12}O_2$) was hydrolysed with dil . H_2SO_4 to give carboxylic acid (B) and an alcohol (C). 'C' gives white turbidity immediately when treated with anhydrous $ZnCl_2$ and conc. HCl . The organic compound (A) is

A. 

B. 

C. 

D. 

Answer:

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70. Match the following :

(i)	Foam	(a)	smoke
(ii)	Gel	(b)	cell fluid
(iii)	Aerosol	(c)	jellies
(iv)	Emulsion	(d)	rubber
		(e)	froth
		(f)	milk

A. (i) - (d) , (ii) - (b) , (iii) - (a) , (iv) - (e)

B. (i) - (b) , (ii) - (c) , (iii) - (e) , (iv) - (d)

C. (i) - (e) , (ii) - (c) , (iii) - (a) , (iv) - (f)

D. (i) - (d) , (ii) - (b) , (iii) - (e) , (iv) - (f)

Answer: D

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71. A 20.0 mL solution containing 0.2 impure H_2O_2 reacts completely with 0.316 g of $KMnO_4$ in acid solution . The purity of H_2O_2 (in%) is .....(mol .wt.of $H_2O_2 = 34$, mol . Wt . Of $KMnO_4 = 158$)

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72. Vapour pressure of solution obtained by mixing 1 mole of n hexane and 3 mole of n-heptane is 550 mm Hg . On mixing 1 mole n-heptane, vapour pressure of solution increases by 10mm Hg. Find the vapour pressure of pure n-heptane

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73. If 75% of a first order reaction was completed in 90 minutes, 60% of the same reaction would be completed in approximately (in minutes) .....

(Take : log 2 = 0.30 , log 2.5 = 0.40)

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74. Find the weight of NH_3 in grams when 2.8 kg N_2 reacts with 1Kg H_2 ?

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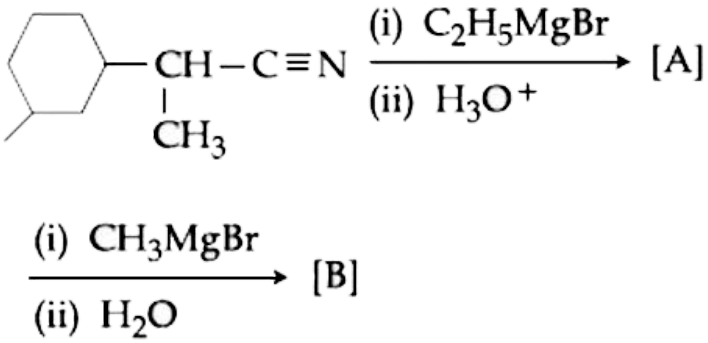
75. The number of chiral centres present in [B] is .....



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76. For a reaction $4M(s) + nO_2(g) \rightarrow 2M_2O_n(s)$,

the free energy change is plotted as a function of temperature. The temperature below which the oxide is stable could be inferred from the plot as the point at which :

A. the siope changes from negative to positive

B. the free energy change shows a changge from negative to positive

C. the slopw changes from positive to negative

D. the slope changes from positive to zeros

Answer:

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77. Average atomic mass of chlorine is 35.5 then the correct naturally occuring molar ratio of $^{35}Cl \& ^{37}Cl$ is

A. $4:1$

B. $3:1$

C. $2:1$

D. $1:1$

Answer:

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78. Which one of the following statements is not true ?

A. Lactose contains α - glycosidic linkage between C_1 of galactose and C_4 of glucose.

B. lactose is a reducing sugar and it gives Fehling 's test

C. Lactose $(C_{11}H_{22}O_{11})$ is a disaccharide and it contains 8 hydroxyl groups.

D. On acid hydrolysis, lactose gives one molecule of D (+) -glucose and one molecule of D (+) - galactose.

Answer:

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79. For an equlibrium reaction $N_2(g) + 3H_2(g) \leftrightarrow 2NH_3(g)$, K_c = 64. what is the equilibriu constant for the reaction

$NH_3(g) \leftrightarrow \frac{1}{2}N_2(g) + \frac{3}{2}H_2(g)$

A. $1/64$

B. 8

C. $1/4$

D. $1/8$

Answer:

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80. Dihydrogen of high purity (> 99.95%) is obtained through :

A. the reaction of Zn with dilute HCl.

B. the electrolysis of acidified water using Pt electrodes.

C. the electrolysis fo brine solution

D. the electrolysis of warm $Ba(OH)_2$ solution using Ni electrodes.

Answer:

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81. The reaction of NO with N_2O_4 at 250 K gives :

A. N_2O

B. NO_2

C. N_2O_3

D. N_2O_5

Answer:

Watch Video Solution

82. The correct match between Item- I (starting meterial) and Item - II (reagent) for the preparation of benzaldehyde is :

	Item - I		Item - II
(I)	Benzene	(P)	HCl and $SnCl_2$, H_3O^+
(II)	Benzonitrile	(Q)	H_2, Pd-$BaSO_4$, S and quinoline
(III)	Benzoyl Chloride	(R)	CO, HCl and $AlCl_3$

A. (I) - (Q), (II) - (R) and (III) - (P)

B. (I) - (P), (II) - (Q) and (III) - (R)

C. (I) - (R) , (II) - (P) and (III) - (Q)

D. (I) - (R) , (II) - (Q) and (III) - (P)

Answer:

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83. In a metal oxide, oxide ions crystallises in CCP lattice in which metal M occupies 50% of octahedral voids and metal M_2 occupies 12.5% of tetrahedral voids. then the oxidation state of metal M_1 and M_2 respectively are:

A. $+2,\ +4$

B. $+1,\ +3$

C. $+3,\ +1$

D. $+4,\ +2$

Answer:

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84. The element that can be refined by distillation is :

A. nickel

B. zinc

C. tin

D. gallium

Answer:

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85. For a d^4 metal ion in an octahedral field, the correct electronic configuration is :

A. $t_{2g}^3 e_g^1$ when $\Delta_0 < P$

B. $t_{2g}^3 e_g^1$ when $\Delta_0 > P$

C. $t_{2g}^4 e_g^0$ when $\Delta_0 < P$

D. $e_g^2 t_{2g}^2$ when $\Delta_0 < P$

Answer:

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86. Match the following

	Test / Method		Reagent
(i)	Lucas Test	(a)	$C_6H_5SO_2Cl$ / aq. KOH
(ii)	Dumas method	(b)	HNO_3/ $AgNO_3$
(iii)	Kjeldahl's method	(c)	CuO/CO_2
(iv)	Hinsberg Test	(d)	Conc. HCl and $ZnCl_2$
		(e)	H_2SO_4

A. $(i)-(d),(ii)-(c),(iii)-(b),(iv)-(e)$

B. $(i)-(b),(ii)-(d),(iii)-(e),(iv)-(a)$

C. $(i)-(d),(ii)-(c),(iii)-(e),(iv)-(a)$

D. $(i)-(b),(ii)-(a),(iii)-(c),(iv)-(d)$

Answer:

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87. Match the following compounds (Column -I) with their uses (Column - II) :

S. No.	Column - I	S. No.	Column - II
(I)	$Ca(OH)_2$	(A)	casts of statues
(II)	NaCl	(B)	white wash
(III)	$CaSO_4 \cdot \frac{1}{2}H_2O$	(C)	antacid
(IV)	$CaCO_3$	(D)	washing soda preparation

A. $(I)-(D),(II)-(A),(III)-(C),(IV)-(B)$

B. $(I)-(B),(II)-(D),(III)-(A),(IV)-(C)$

C. $(I)-(B),(II)-(C),(III)-(D),(IV)-(A)$

D. $(I)-(C),(II)-(D),(III)-(B),(IV)-(A)$

Answer:

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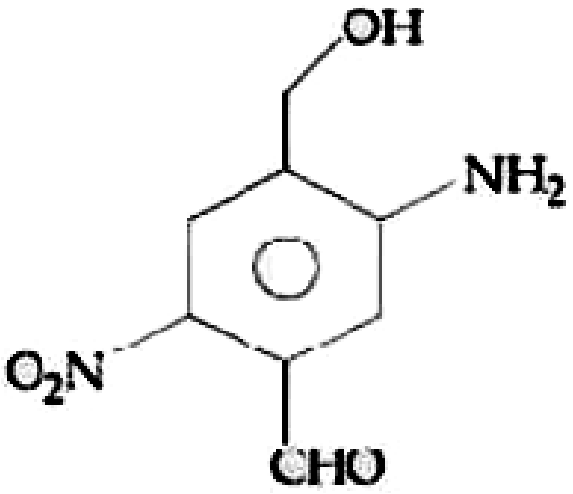
88. The IUPAC name of the following compound is



A. 2 -nitro - 4 - hydroxymethyl 1-5 - amino benzaledehyde

B. 3-amino - 4 hydroxymethy 1-5- nitrobenzaldehyde

C. 5 - amino -4 hydroxymethy 1-2-nitrobenzaldehyde

D. 4 - amino - 2 - formy 1-5- hydroxymethyl nitrobenzene

Answer:

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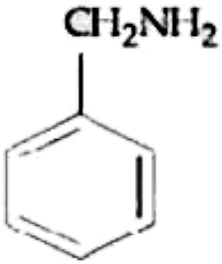
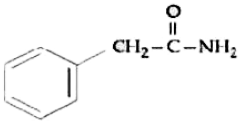
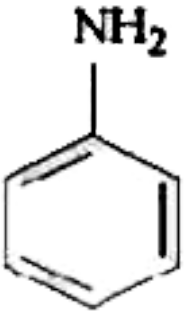
89. Which of the following compounds can be prepared in good yield by Gabriel phthalimide synthesis ?

A. 

B. $CH_3 - CH_2 - NHCH_3$

C. 

D. 

Answer:

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90. A set of solution is prepared using 180 g of water as a solvent and 10 g of different non - volatile solutes A, B and C . The relative lonwering of vapour pressure in the presence of these solutes are in the order . [Given , molar mass of $A = 100 gmol^{-1}$ $B = 200 gmol^{-1}, C = 10,000 gmol^{-1}$]

A. $B > C > A$

B. $C > B > A$

C. $A > B > C$

D. $A > C > B$

Answer:

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91. For the given concentration cell

$Cu(s)\left|Cu^{2+}(C_2M)\right|\left|Cu^{2+}(C_1M)\right|Cu(s)$

Gibbs energy $\triangle$ G is negative if:

A. $C_1 = C_2$

B. $C_2 = C_1/\sqrt{2}$

C. $C_1 = 2C_2$

D. $C_2 = \sqrt{2}C_1$

Answer:

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92. Reaction of an inorganic sulphite X with dilute $H_2SO_4)$ generates compound Y . Reaction of Y with NaOH gives X . Further , the reaction of X and Y and water affords compound Z . Y and Z respectively are :

A. SO_2 and Na_2SO_3

B. SO_3 and $NaHSO_3$

C. SO_2 and $NaHSO_3$

D. S and Na_2SO_3

Answer:

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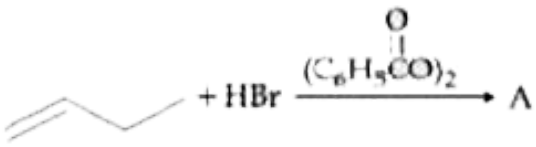
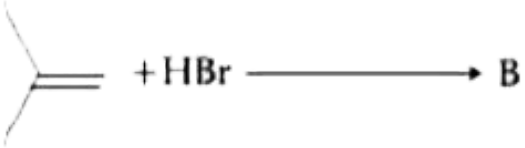
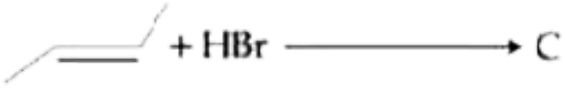
93. The increasing order of the boiling points of the major products A, B and C of the following reactions will be :

(a) 

(b) 

(c) 

A. $B < C < A$

B. $C < A < B$

C. $A < B < C$

D. $A < C < B$

Answer:

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94. Misch metal is an alloy consisting mainly of :

A. lanthanoid metals

B. actinoid and transition metal

C. lanthanoid and actinoid metals

D. actinoid metals

Answer:

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95. The correct match between Item - I and Item - II is :

	Item - I		Item - II
(a)	Natural rubber	(I)	1, 3-butadiene + styrene
(b)	Neoprene	(II)	1, 3-butadiene + acrylonitrile
(c)	Buna-N	(III)	Chloroprene
(d)	Buna-S	(IV)	Isoprene

A. (a) -(III) , (b) - (IV) , (c) - (I) , (d) - (II)

B. (a) - (III) , (b) - (IV), (c) - (II) ,(d)- (I)

C. (a) - (IV) , (b) - (III) , (c) - (II) , (d) - (I)

D. (a) - (IV), (b) - (III), (c) - (I), (d) - (II)

Answer:

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96. If the solubility product of AB_2 is $3.2x10^{-11}M^{-1}$, then the solubilty of AB_2 in pure water is _____ $\times 10^{-4} molL^{-1}$. [Assuming that neither kind of ion reacts with water].

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97. For freundlich adsorption isotherm, a plot of log (x/m) (y - axis) and log p (x-axis) gives a straight line . The intercept and slope for the line is 0.4771 and 2, respectively . The mass of gas , adsorbed per gram of adsorbent if the intital pressure is 0.04 atm , is _____ $\times 10^{-4}$ g. (log 3=0.4771).

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98. A solution of phenol in chlorofom when treated with aqueous NaOH gives compound Pasa major product . The mass percentage of

carbon in P is _____ (to the nearest integer).

(Atomic mass : $C = 12, H = 1, O = 16$)

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99. The atomic number of Unnilunium is _____ .

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100. The rate of a reaction decreased by 3.555 times when the temperature was changed from $40^\circ C$ to $30^\circ C$. The activation energy (in kj mol^{-1}) of the reaction is _____.

Take : R = 8314 J $mol^{-k}\ K^{-1}$ In 3.555 = 1268

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101. The mechanism of action of "Terfenadine" (Seldane) is :

A. Activates the histamine receptor

B. Inhibits the action of histamine receptor

C. Inhibits the secretion of histamine

D. Helps in the secretion of histamine

Answer:

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102. The one that can exhibit highest paramagnetic behaviour among the following is :

gly = glycinato , byy = 2, 2'-bipyridine

A. $\left[Ti(NH_3)_6\right]^{3+}$

B. $\left[Co(OX)_2(OH)_2\right]^{-}(\Delta_0 > P)$

C. $\left[Pd(\text{gly})_2\right]$

D. $\left[Fe(en)(bpy)(NH_3)_2\right]^{2+}$

Answer:

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103. The process of calcination and roasting in metallurgical industries, respectively, can lead to :

A. Global warming and acid rain

B. Photochemical smog and global warming

C. Global warming and photochemical smog

D. Photochemical smog and ozone layer depletion

Answer:

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104. In colloidal solution of blue ink following reagent are mixed

H_2O, Egg,CH_3COOH & HCl

then which of the obove reagent ensure the stability of blue ink

A. HCHO

B. Egg white

C. Water

D. Eosin dye

Answer:

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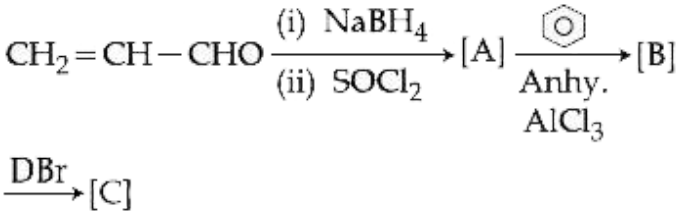
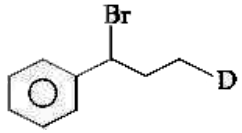
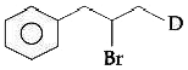
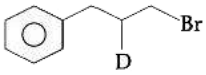
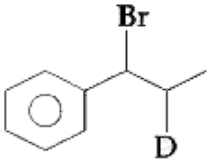
105. The major product [C] of the following reaction sequence will be :



A. 

B. 

C. 

D. 

Answer:

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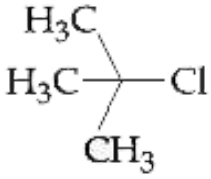
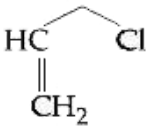
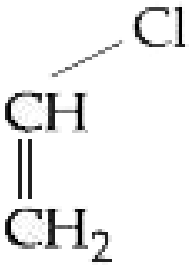
106. Among the following compounds, which one has the shortest $C - Cl$ bond?

A. $H_3C - Cl$

B. 

C. 

D. 

Answer: D

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107. In the equilibrium constant for $A \Leftrightarrow B + C$ is $K_{eq}^{(1)}$ and that of $B + C = P$ is $K_{eq}^{(2)}$, the equilibrium constant for $A \Leftrightarrow P$ is :

A. $K_{eq}^{(1)} / K_{eq}^{(2)}$

B. $K_{eq}^{(2)} - K_{eq}^{(1)}$

C. $K_{eq}^{(1)} K_{eq}^{(2)}$

D. $K_{eq}^{(1)} + K_{eq}^{2}$

Answer:

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108. The Crystal Field Stabilization Energy (CFSE) of $\left[CoF_3(H_2O)_3\right](\Delta_0 < P)$ is :

A. $-0.8\Delta_0 + 2P$

B. $-0.8\Delta_0$

C. $-0.4\Delta_0$

D. $-0.4\Delta_0 + P$

Answer:

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109. The major product [B] in the following reaction is :

$$CH_3 - CH_3 - \overset{CH}{\underset{|}{\text{CH}}} - CH_2 - OCH_2 - CH_3 \xrightarrow[\text{Heat}]{HI} [A] \quad \text{alcohol} \xrightarrow[\Delta]{H_2SO_4} [B]$$

A. $CH_3 - CH_2 - CH = CH - CH_3$

B. $CH_2 = CH_2$

C. $CH_3 - CH = \overset{CH_3}{\underset{|}{\text{C}}} - CH_3$

D. $CH_3 - CH_2 - \overset{CH_3}{\underset{|}{\text{C}}} = CH_2$

Answer:

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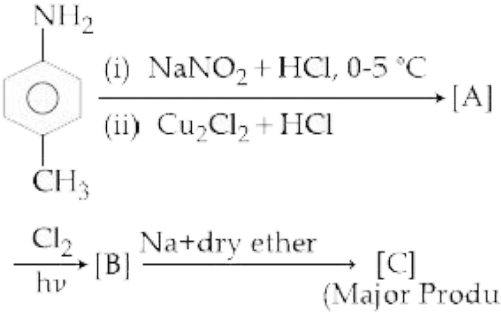
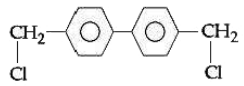
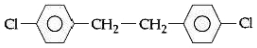
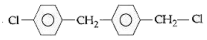
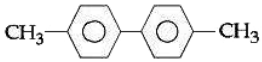
110. In the following reaction sequence, [C] is :



A. 

B. 

C. 

D. 

Answer:

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111. In which of the following reaction, Hybridisation of underline atom gets changed

A. $H_2\underline{S}O_4 + NaCl \xrightarrow{420K}$

B. $\underline{N}H_3 \xrightarrow{H^+}$

C. $H_3\underline{P}O_2 \xrightarrow{\text{Disproportionation}}$

D. $\underline{Xe}F_4 + SbF_5 \rightarrow$

Answer:

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112. 250 mL of a waste solution obtained from the workshop of a goldsmith contains $0.1MAgNO_3$ and $0.1MAuCl$. The solution was electrolyzed at 2 V by passing a current of 1 A for 15 minutes. The metal/metals electrodeposited will be :

$\left(E^{\circ}_{Ag^+/Ag} = 0.80V, E^{\circ}_{Au^+/Au} = 1.69V\right)$

A. silver and gold in equal mass proportion

B. only gold

C. only silver

D. silver and gold in proportion to their atomic weights

Answer:

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113. The incorrect statement(s) among (a) - (c) is (are):

(a) W(VI) is more stable than Cr(IV).

(b) in the presence of HCl, permanganate titrations provide satisfactory results.

(c)some lanthanoid oxides can be used as phosphors.

A. (a) only

B. (b) and (c) only

C. (b) only

D. (a) and (b) only

Answer:

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114. The process that is NOT endothermic in nature is :

A. $Ar_{(g)} + e^- \rightarrow Ar^-_{(g)}$

B. $H_{(g)} + e^- \rightarrow H^-_{(g)}$

C. $O^-_{(g)} + e^- \rightarrow O^{2-}_{(g)}$

D. $Na_{(g)} \rightarrow Na^+_{(g)} + e^-$

Answer:

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115. An alkaline earth metal 'M' readily forms water soluble sulphate and water insoluble hydroxide. Its oxide MO is very stable to heat and does not have rock - salt structure. M is

A. Be

B. Ca

C. Sr

D. Mg

Answer:

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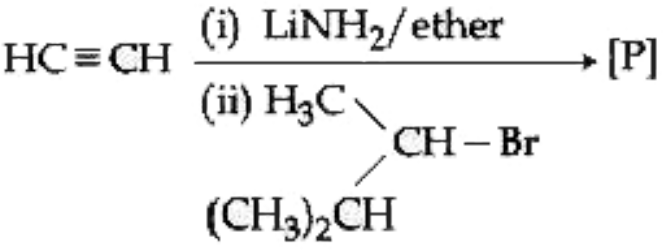
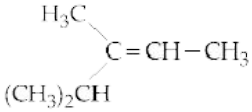
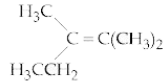
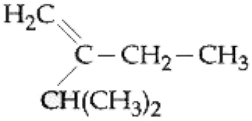
116. The major product [R] in the following sequence of reactions is :

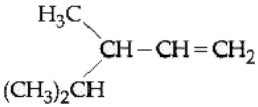


$$\xrightarrow[(ii)\,NaBH_4]{(i)\,HgSO_4/H_2SO_4} [Q] \xrightarrow[\Delta]{\text{Conc. } H_2SO_4} [R]$$

A. 

B. 

C. 

D. 

Answer:

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117. The molecule in which hybrid MO s involve only one d - orbital of the central atom is :

A. XeF_4

B. BrF_5

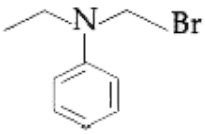
C. $[CrF_6]^{3-}$

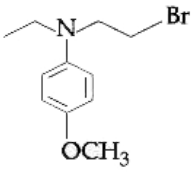
D. $[Ni(CN)_4]^{2-}$

Answer:

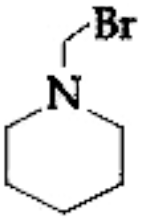
Watch Video Solution

118. Which of the following compounds will form the precipitate with $aq.\ AgNO_3$ solution most readily?

A. 

B. 

C. 

D. 

Answer:

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119. 5 mole of an ideal gas of volume is expanded against vaccum to make its volume 2 times, then work done by the gas is:

A. $-RT(V_2 - V_1)$

B. zero

C. $C_V(T_2 - T_1)$

D. $-RT\ln V_2/V_1$

Answer:

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120. The shortest wavelength of H-atom in Lyman series is x, then longest wavelength in Balmer series of He^+ is

A. $\frac{5\lambda_1}{9}$

B. $\frac{27\lambda_1}{5}$

C. $\frac{36\lambda_1}{5}$

D. $\frac{9\lambda_1}{5}$

Answer:

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121. Consider the following equations :

$2Fe^{2+} + H_2O_2 \rightarrow xA + yB$
(in basic medium)

$2MnO_4^- + 6H^+ + 5H_2O_2 \rightarrow x'C + y'D + z'E$
(in acidic medium)

The sum of the stoichiometric coefficients

$x, y, x'y'$ and z' for products A, B, C, D and E, respectively, is

_____.

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122. A 100 mL solution was made by adding 1.43 g of $Na_2CO_3.xH_2O$.

The normality of the solution is 0.1 N. The value of x is _____.

$(\text{The atomic mass of Na is } 23 \text{ g/mol})$

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123. The number of molecules with energy greater than tha threshold enegy for a reaction increases five fold by a rise of temperature from $27^\circ C$ to $42^\circ C$. Its energy of activation in J/mol is _____. (Take $\ln 5 = 1.6094, R = 8.314 \text{ J mol}^{-1}K^{-1}$)

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124. The number of chiral centres present in threonine is _____.

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125. The osmotic pressure of a solution of NaCl is 0.10 atm and that of a glucose solution is 0.20 atm. The osmotic pressure of a solution formed by mixing 1 L of the sodium chloride solution with 2L of the glucose solution is $x \times 10^{-3}$ atm. x is _____.(nearest integer)

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126. It is true that :

A. A second order reaction is always a multistep reaction

B. A first order reaction is always a single step reaction

C. A zero order reaction is a multistep reaction

D. A zero order reaction is a single step reaction

Answer: C

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127. An acidic buffer is obtained on mixing :

A. 100 mL of 0.1 M HCl and 200 mL of 0.1 M CH_3COONa

B. 100 mL of 0.1 M HCl and 200 mL of 0.1 M NaCl

C. 100 mL of 0.1 M CH_3COOH and 100 mL of 0.1 M NaOH

D. 100 mL of 0.1 M CH_3COOH and 200 mL of 0.1 M NaOH

Answer: A

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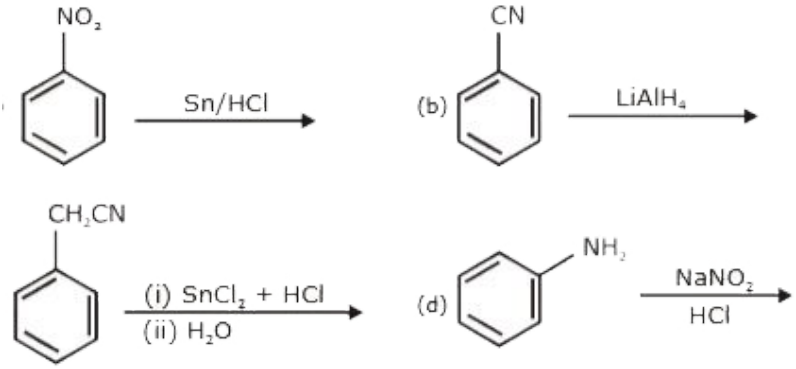
128. The Kjeldahl method of Nitrogen estimation fails for which of the following reaction products?



A. (a), (c) and (d)

B. (b) and (c)

C. (c) and (d)

D. (a) and (d)

Answer: C

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129. If the boiling point of H2O is 373 K, the boiling point of H2S will be :

A. greater than 300 K but less than 373 K

B. equal to 373 K

C. more than 373 K

D. less than 300 K

Answer: D

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130. The complex that can show optical activity is :

A. $cis - \left[CrCl_2(ox)_2\right]^{3-} \quad (\text{ox} = \text{oxalate})$

B. $trans - \left[Fe(NH_3)_2(CN)_4\right]^-$

C. $trans - \left[Cr(Cl_2)(ox)_2\right]^{3-}$

D. $cis - \left[Fe(NH_3)_2(CN)_4\right]^-$

Answer: A

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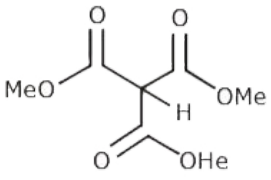
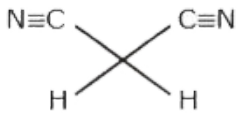
131. Which one of the following compounds possesses the most acidic hydrogen?

A. $H_3C - C \equiv C - H$

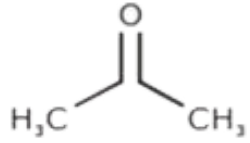
B.



C.



D.



Answer: C

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132. Aqua regia is used for dissolving noble metals (Au, Pt, etc.). The gas evolved in this process is :

A. N_2O_3

B. N_2

C. N_2O_5

D. NO

Answer: D

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133. The antifertilituy drug "Novestrol" can react with :

A. Br_2 / water, $ZnCl_2$ / HCl, $FeCl_3$

B. Br_2 / water, $ZnCl_2$ / HCl, $NaOCl$

C. Alcoholic HCN, NaOCl , $ZnCl_2$ / HCl

D. $ZnCl_2$ / HCl, $FeCl_3$, Alcoholic HCN

Answer: A

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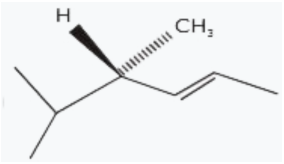
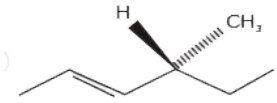
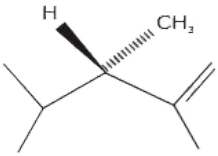
134. Which of the following compounds produces an optically inactive compound on hydrogenation?

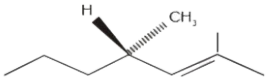
A. 

B. 

C.



D.



Answer: C

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135. Of the species, NO, NO^+, NO^{2+} and NO^-, the one with minimum bond strength is :

A. NO^-

B. NO^+

C. NO^{2+}

D. NO

Answer: A

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136. Glycerol is separated in soap industries by :

A. Fractional distillation

B. Distillation under reduced pressure

C. Differential extraction

D. Steam distillation

Answer: B

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137. Effect of thermal power plant is

A. Ozone layer depletion

B. Blue baby syndrome

C. Eutrophication

D. Acid rain

Answer: D

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138. Henry's constant (in kbar) for four gases α, β, γ and δ in water at 298 K is given below :

	α	β	γ	δ
K_H	50	2	2×10^{-5}	0.5

$\left(\text{density of water} = 103 \text{ kg m}^{-3} \text{ at } 298 \text{ K}\right)$

This table implies that :

A. solubility of γ at 308 K is lower than at 298 K

B. The pressure of a 55.5 molal solution of δ is 250 bar

C. α has the highest solubility in water at a given pressure

D. The pressure of a 55.5 molal solutio of γ is 1 bar

Answer: A

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139. The electronic spectrum of $\left[Ti(H_2O)_6\right]^{3+}$ shows a single broad peak with a maximum at $20{,}300\ \text{cm}^{-1}$.

The crystal field stabillization energy (CFSE) of the complex ion, in kJ mol^{-1}, is :

$\left(1\ \text{kJ mol}^{-1} = \quad 83.7\ \text{cm}^{-1}\right)$

A. 83.7

B. 242.5

C. 145.5

D. 97

Answer: D

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140. The atomic number of the element unnilennium is :

A. 109

B. 102

C. 119

D. 108

Answer: A

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141. An organic compound [A], molecular formula $C_{10}H_{20}O_2$ was hydrolyzed with dilute sulphuric acid to

give a carboxylic acid [B] and an alcohol [C]. Oxidation of [C] with

$CrO_3 - H_2SO_4$ produced [B].

Which of the following strucutres are not possible for [A]?

A. $(CH_3)_3 - C - COOCH_2C(CH_3)_3$

B. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - OCOCH_2\overset{\overset{CH_3}{|}}{CH} - CH_2CH_3$

C. $CH_3CH_2CH_2COOCH_2CH_2CH_2CH_3$

D. $CH_3 - CH_2 - \underset{\underset{CH_3}{|}}{CH} - COOCH_2 - \overset{\overset{CH_3}{|}}{CH} - CH_2CH_3$

Answer: B

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142. The mechanism of SN1 reaction is given as :

$$R - X \underset{\text{Ion pair}}{-} R^{\oplus}X^{\Theta} \rightarrow \underset{\text{Solvent Separated ion pair}}{R^{\oplus}||X^{\Theta}} \xrightarrow{Y^{\Theta}} R - Y + X^{\Theta}$$

A student writes general characteristics based on the given mechanism as :

(a) The reaction is favoured by weak nucleophiles.

(b) $R^{\oplus}$ would be easily formed if the substituents are bulky.

(c) The reaction is accompanied by racemization.

Which observations are correct?

A. (a) and (b)

B. (a), (b) and (c)

C. (a) and (c)

D. (b) and (d)

Answer: B

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143. Tyndall effect is observed when:

A. The diameter of dispersed particles is much smaller than the wavelength of light used.

B. The diameter of dispersed particles is much larger than the wavelength of light used.

C. The refractive index of dispersed phase is greater than that of the dispersion medium.

D. The diameter of dispersed particles is similar to the wavelenght of light used.

Answer: D

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144. Let C_{NaCl} and C_{BaSO_4} be the conductances (in S) measured for saturated aqueous solutions of NaCl and BaSO4, respectively, at a temperature T.

Which of the following is false?

A. $C_{NaCl}(T_2) > C_{NaCl}(T_1)$ for $T_2 > T_1$

B. $C_{BaSO_4}(T_2) > C_{BaSO_4}(T_1)$ for $T_2 > T_1)$

C. Ionic mobilities of ions form both salts increase with T.

D. $C_{NaCl} > > C_{BaSO_4}$ at a given T

Answer: D

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145. In a molecule of pyrophosphoric acid, the number of $P-OH, P=O$ and $P-O-P$ bonds/moiety(ies) respectively are :

A. 3, 3 and 3

B. 4, 2 and 1

C. 2, 4 and 1

D. 4, 2 and 0

Answer: B

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146. The mole fraction of glucose $(C_6H_{12}O_6)$ in an aqueous binary solution is 0.1. The mass percentage of water in it, to the nearest integer, is _____.

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147. The volume strength of $8.9\ \mathrm{M}$ H_2O_2 solution calculated at 273 K and 1 atm is _____. $\left(\mathrm{R} = 0.0821\ \mathrm{L\ atm\ K^{-1}\ \ mol^{-1}}\right)$ (rounded off ot the nearest integer)

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148. An element with molar mas 2.7×10^{-2} $\mathrm{kg\,mol^{-1}}$ forms a cubic unit cell with edge length 405 pm. If its density is $2.7 \times 10^{-3} kgm^{-3}$, the radius of the element is approximately _____ $\times 10^{-12} m$ (to the nearest integer).

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149. The total number of monohalogenated organic products in the following (including stereoisomers) reaction is _____.

$$A \xrightarrow[(ii)\, X_2 / \Delta]{(i)\, H_2 / Ni / \Delta}$$

(Simplect optically active alkene)

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150. The photoelectric current from Na (Work function,w_0 = 2.3 eV) is stopped by the output voltage of the cell $Pt(s)H_2(\mathrm{g,\,1\,Bar})\ \mathrm{HCl\ (aq.\ pH} = 1)\ |AgCl(s)|Ag(s)$.

The pH of aq. HCl required to stop the photoelectric current form $K(w_0 = 2.25eV)$, all other conditions remaining the same, is _____ $\times 10^{-2}$ (to the nearest integer).

Given,

$2.303\frac{RT}{F} = 0.06V, E^{\circ}_{AgCl\,|\,Ag\,|\,Cl^-} = 0.22V$

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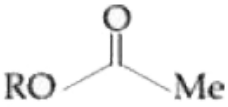
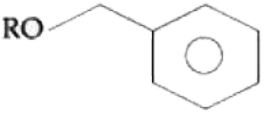
151. Which of the following derivatives of alcohols is unstable in an aqueous base ?

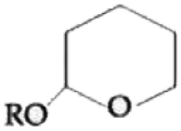
A.



B.



C.



D. $RO - Cme_3$

Answer:

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152. The values of the crystal field stabilization energies for a high spin d^6 metal ion in octahedral and tetrahedral fields, respectively, are :

A. $-0.4\Delta_{\circ}$ and $-0.6\Delta_t$

B. $-2.4\Delta_{\circ}$ and $-0.6\Delta_t$

C. $-1.6\Delta_{\circ}$ and $-0.4\Delta_t$

D. $-0.4\Delta_{\circ}$ and $-0.27\Delta_t$

Answer:

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153. For the following reaction at equilibrium

$2NO_2(g) \leftrightarrow N_2O_4(g)\ \Delta H = -58$KJ/mole

following change are made then identify in which direction reaction shift

	Increase in temperature	Increase in pressure
(1)	towards product side	towards product side
(2)	towards reactant side	towards product side
(3)	towards reactant side	towards reactant side
(4)	towards product side	towards reactant side

A. (a) towards product, (b) towards rectant

B. (a) towards reactant, (b) towards product

C. (a) towards reactant, (b) no change

D. (a) towards product , (b) no change

Answer:

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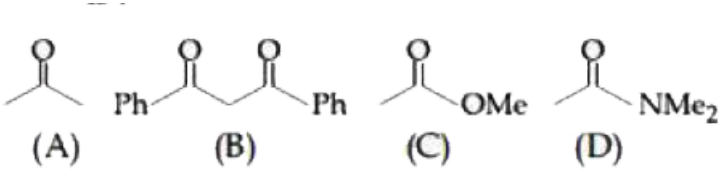
154. The increasing order of the acidity of the α- hydrogen of the following compounds is :



A. $(D) < (C) < (A) < (B)$

B. $(B) < (C) < (A) < (D)$

C. $(A) < (C) < (D) < (B)$

D. $(C) < (A) < (B) < (D)$

Answer:

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155. A diatomic molecule X_2 has a body- centred cubic (bcc) structure with a cell edge of 300pm. The density of the molecuel is $6.17 gcm^{-3}$.

The number of molecules present in 200 g of X_2 is :

(Avogadroconstant $(N_A) = 6 \times 10^{23} mol^{-1}$)

A. $40N_A$

B. $8N_A$

C. $4N_A$

D. $2N_A$

Answer:

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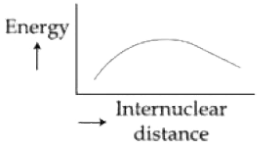
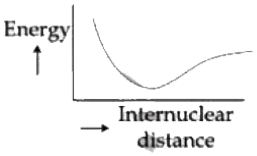
156. The potential energy curve for the H_2 molecule as a function of internuclear distance is :

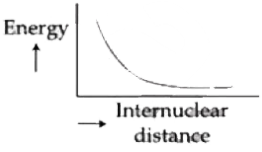
A.



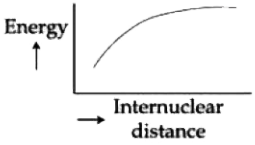
B.



C.



D.



Answer:

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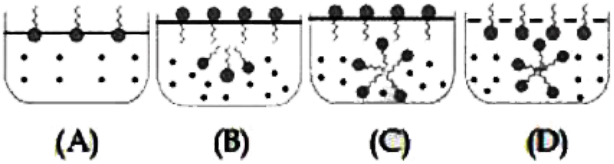
157. Identify the correct molecular picture showing what happens at the critical micellar concentration (CMC) of an aqueous solution of a surfactant (polar head , non - polar tail , water) .



A. (D)

B. (B)

C. (A)

D. (C)

Answer:

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158. The difference between the radii of 3^{rd} and 4^{th} orbits of Li^{2+} is ΔR_1 . The difference between the radii of $3^r d$ and 4^{th} orbits of He^+ is ΔR_2 . Ratio $\Delta R_1 : \Delta R_2$ is :

A. $8:3$

B. $3:8$

C. $2:3$

D. $3:2$

Answer:

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159. In the sixth period , the orbitals that are filled are :

A. 6s , 4 f , 5d , 6p

B. 6s , 5 d , 5f , 6p

C. 6s , 5f , 6d , 6p

D. 6s , 5f , 6d , 6f

Answer:

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160. The most appropriate reagent for conversion of C_2H_5CN into $CH_3CH_2CH_2NH_2$ is :

A. $NaBH_4$

B. CaH_2

C. $LiAlH_4$

D. $Na(CN)BH_3$

Answer:

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161. If a person is suffering from the deficiency of nor- adrenaline , what kind of drug can be suggested ?

A. Anti - inflammatory

B. Antidepressant

C. Antihistamine

D. Analgesic

Answer:

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162. Which of the following is not an essential amino acid ?

A. Tyrosine

B. Leucine

C. Valine

D. Lysine

Answer:

Watch Video Solution

163. The correct electronic configuration and spin -only magnetic moment (BM) of Gd^{3+} (Z = 64) , respectively , are :

A. [Xe] $4f^7$ and 8.9

B. [Xe] $4f^7$ and 7.9

C. [Xe] $5f^7$ and 8.9

D. [Xe] $5f^7$ and 7.9

Answer:

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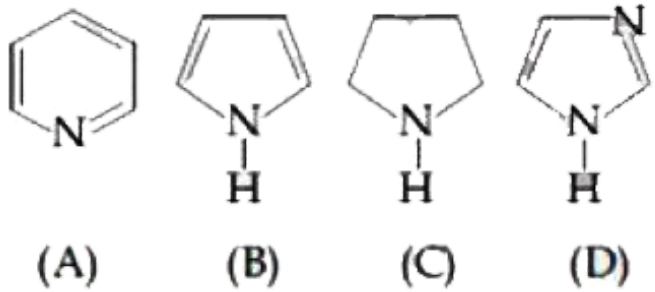
164. The increasing order of the basicity of the following compounds is :



(A) (B) (C) (D)

A. $(A) < (B) < (C) < (D)$

B. $(B) < (A) < (D) < (C)$

C. $(D) < (A) < (B) < (C)$

D. $(B) < (A) < (C) < (D)$

Answer:

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165. A flask contains a mixture of compounds A and B . Both compounds decompose by first - order kinetics . The half - lives for A and B are 300 s and 180 s , respectively . If the concentration of A and B are equal initially , the time required for the concentration of A to be four times that of B (in s) is : (Use In 2 : 0.693)

A. 180

B. 900

C. 300

D. 120

Answer: C

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166. The structure of PCl_5 in the solid state is :

A. tetrahedral $[PCl_4]^+$ and ortahedral $[PCl_6]^-$

B. square planar $[PCl_4]^+$ and octahedral $[PCl_6]^-$

C. square pyramidal

D. trigonal bipyramidal

Answer:

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167. An Ellingham diagram provides information about :

A. the conditions of pH and potential under which a species is thermodynamically stable .

B. the temperature dependence of the standard Gibbs energies of formation of some metal oxides .

C. the pressure dependence of the standard electrode potentials of reduction reactions involved in the extration of metals .

D. the kinetics of the reduction process.

Answer:

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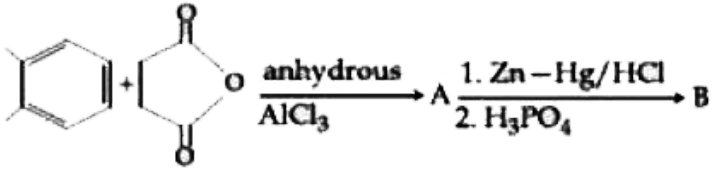
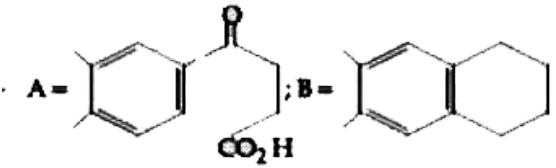
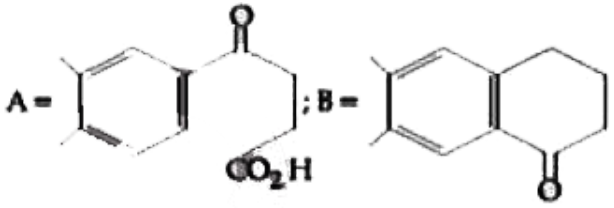
168. In the following reaction sequence the major products A and B are :



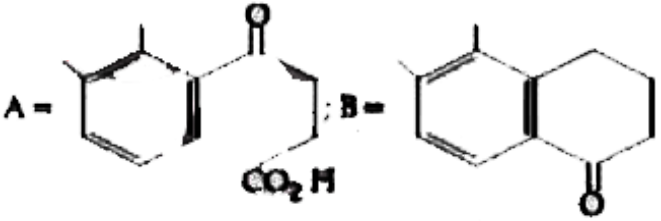
A.



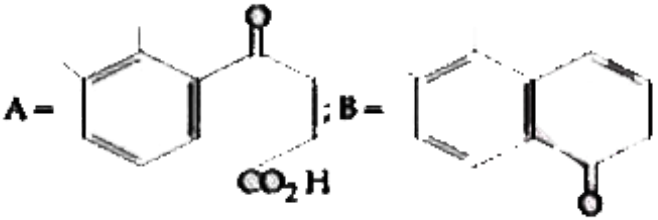
B.



C.



D.



Answer:

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169. The equation that represents the water gas shift reaction is :

A. $CH_4(g) + H_2O(g) \xrightarrow[\text{Ni}]{1270K} CO(g) + 3H_2(g)$

B. $2C(s) + O_2(g) + 4N_2(g) \xrightarrow{1273K} 2CO(g) + 4N_2(g)$

C. $C(s) + H_2O(g) \xrightarrow{1270K} CO(g) + H_2(g)$

D. $CO(g) + H_2O(g) \xrightarrow[\text{Catalyst}]{673K} CO_2(g) + H_2(g)$

Answer:

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170. The condition that indicates a polluted environment is :

A. eutrophication

B. $0.03\ \%$ of CO_2 in the atmosphere

C. BOD value of 5 ppm

D. pH of rain water to be 5.6

Answer:

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171. The minimum number of moles of O_2 required for complete combustion of 1 mole of propane and 2 moles of butane is _____.

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172. The total number of coordination sites in ethylenediaminetetraacetate $\left(EDTA^{4-}\right)$ is _____.

Watch Video Solution

173. The number of chiral carbon(s) present in peptide , Ile-Arg-Pro is _____.

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174. A soft drink was bottled with a partial pressure of CO_2 of 3 bar over the liquid at room temperature . The partial pressure of CO_2 over the solution approaches a value of 30 bar when 44 g of CO_2 is dissolved in 1 kg of water at room temperature . The approximate pH of the soft drink is _____ $\times 10^{-1}$.

(First dissocation constant of $H_2CO_3 = 4.0 \times 10^{-7}$, log 2 = 0.3 , density of the soft drink = 1 gmL^{-1})

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175. An oxidation- reduction reaction in which 3 electrons are transferred has a ΔG^0 of $17.37kJmol^{-1}$ at $25^\circ C$. The value of E^0_{cell} (in V) is _____ $\times 10^{-2}$

$\left(1F = 96,500Cmol^{-1}\right)$

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176. Cast iron is used for the production of

A. Wrought iron and steel

B. Wrought iron and pig iron

C. Wrougth iron, pig iron and steel

D. Pig iron, scrap iron and steel

Answer:

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177. The shape/structure of $[XeF_5]^-$ and XeO_3F_2, respectively, are :

A. Pentagonal planar and trigonal bipyramidal

B. Trigonal bipyramidal and trigonal bipyramidal

C. Octahedral and square pyramidal

D. Trigonal bipyramidal and pentagonal planar

Answer:

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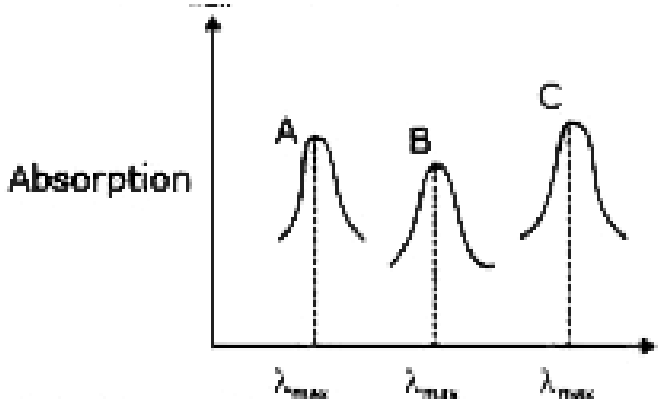
178. Simplified absorption spectra of three complexes ((i), (ii) and (iii)) of Mn+ ion are provided below, their λ_{max} values are marked as A, B and C respectively. The correct match between the complexes and their λ_{max} values is :



(i) $\left[M(NCS)_6\right]^{-6+n}$

(ii) $\left[MF_6\right]^{-6+n}$

(iii) $\left[M(NH_3)_6\right]^{n+}$

A. A-(i), B-(ii), C-(iii)

B. A-(iii), B-(i), C-(ii)

C. A-(ii), B-(iii), C-(i)

D. A-(ii), B-(i), C-(iii)

Answer:

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179. $sucrose \xrightarrow{hydrolysis} A + B \xrightarrow[rea \geq nt]{seliwanoff}$

which color is obtained after above reaction?

A. Formation of red colour

B. Formation of blue colour

C. Formation of violet colour

D. Gives no colour

Answer:

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180. The results given in the below table were obtained during kinetic studies of the following reaction : $2A + B \rightarrow C + D$

Experiment	[A]/ $molL^{-1}$	[B]/ $molL^{-1}$	Initial rate/ $molL^{-1}\ min^{-1}$
I	0.1	0.1	6.00×10^{-3}
II	0.1	0.2	2.40×10^{-2}
III	0.2	0.1	1.20×10^{-2}
IV	X	0.2	7.20×10^{-2}
V	0.3	Y	2.88×10^{-1}

X and Y in the given table are respectively :

A. 0.4, 0.4

B. 0.3, 0.4

C. 0.4, 0.3

D. 0.3, 0.3

Answer:

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181. Match the type of interaction in column A with the distance dependence of their interaction energy in column B :

	A		B
(I)	ion-ion	(a)	$\frac{1}{r}$
(II)	dipole-dipole	(b)	$\frac{1}{r^2}$
(III)	London dispersion	(c)	$\frac{1}{r^3}$
		(d)	$\frac{1}{r^6}$

A. (I)-(a), (II)-(b), (III)-(d)

B. (I)-(a), (II)-(b), (III)-(c)

C. (I)-(a), (II)-(c), (III)-(d)

D. (I)-(a), (II)-(c), (III)-(b)

Answer:

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182. The major product obtained from E_2– elimination of 3-bromo-2-fluoropentane is :

A. $CH_3CH_2CH = C - F$

B. $CH_3CH_2 - \overset{Br}{\overset{|}{C}}H - CH = CH_2$

C. $CH_3 - CH_2 - C = C - CH_3$

D. $CH_3 - CH = CH - \overset{F}{\overset{|}{C}}H - CH_3$

Answer:

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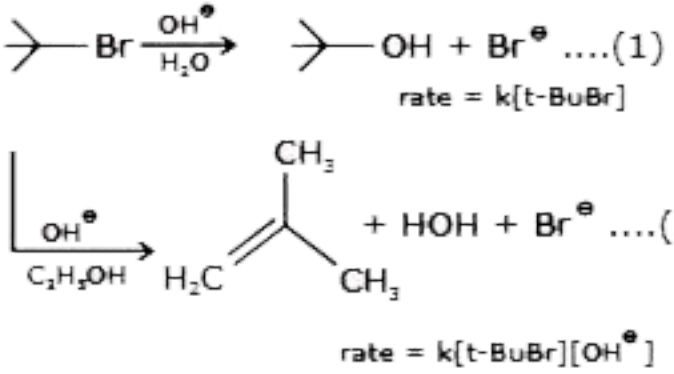
183. Consider the reaction sequence given below :



Which of the following statements is true :

A. Changing the concentration of base will have no effect on reaction (1).

B. Doubling the concentration of base will double the rate of both the reactions.

C. Changing the base from $OH^{\ominus}$ to $^{\ominus}OR$ will have no effect on reaction (2).

D. Changing the concentration of base will have no effect on reaction (2).

Answer:

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184. The size of a raw mango shrinks to a much smaller size when kept in a concentrated salt solution. Which one of the following process can explain this ?

A. Diffusion

B. Osmosis

C. Reverse osmosis

D. Dialysis

Answer:

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185. If you spill a chemical toiled cleaning liquid on your hand, your first aid would be :

A. Aqueous NH_3

B. Aqueous $NaHCO_3$

C. Aqueous NaOH

D. Vinegar

Answer:

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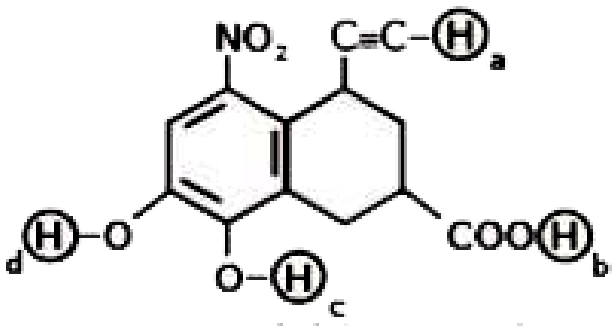
186. Arrange the followig labelled hydrogens in decreasing order of acidity :



A. $b > a > c > d$

B. $b > c > d > a$

C. $c > b > d > a$

D. $c > b > a > d$

Answer:

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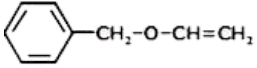
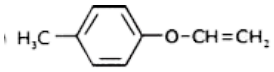
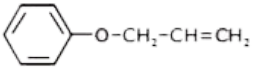
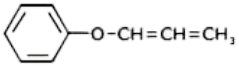
187. An organic compound 'A' $(C_9H_{10}O)$ when treated with conc. HI undergoes cleavage to yield compounds 'B' and 'C'. 'B' gives yellow precipitate with $AgNO_3$ where as 'C' tautomerizes to 'D'. 'D' givespositive iodoform test. 'A' could be :

A. 

B. 

C. 

D. 

Answer:

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188. Two elements A and B have similar chemical properties. They don't form solid hydrogencarbonates, but react with nitrogen to form nitrides. A and B, respectively, are :

A. Na and Ca

B. Cs and Ba

C. Na and Rb

D. Li and Mg

Answer:

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189. The number of subshells associated with n = 4 and m = –2 quantum numbers is :

A. 4

B. 8

C. 16

D. 2

Answer: D

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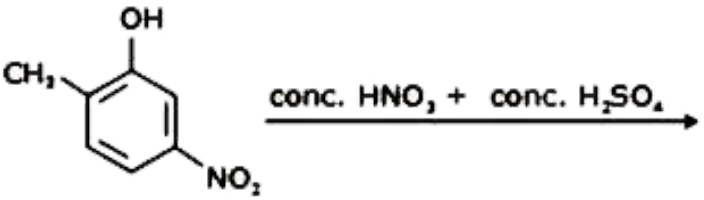
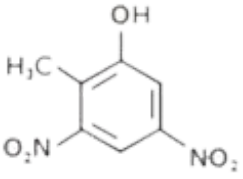
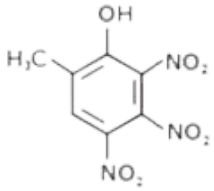
190. The major product of the following reaction is :

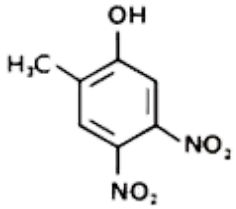




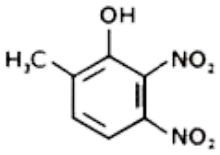
A.



B.



C.



D.

Answer:

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191. Two compounds A and B with same molecular formula (C_3H_6O) undergo Grignard's reaction with methylmagnesium bromide to give products C and D. Products C and D show following chemical tests.

Test	C	D
Ceric ammonium nitrate Test	Positive	Positive
Lucas Test	Turbidity obtained after five minutes	Turbidity obtained immediately
Iodoform Test	Positive	Negative

A. $CH = H_3C - CH_2 - CH_2 - CH_2 - OH,$

$$D = H_3C - CH_2 - \underset{\underset{OH}{|}}{C}H - CH_3$$

B. $$C = H_3C - CH_2 - \underset{\underset{OH}{|}}{C}H - CH_3, D = H_3C - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$$

C.

$$C = H_3C - CH_2 - CH_2 - CH_2 - OH, D = H_3C - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH$$

D. $C = H_3C - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH, D = H_3C - CH_2 - \underset{\underset{OH}{|}}{C}H - CH_3$

Answer:

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192. Three elements X, Y and Z are in the 3^{rd} periodic table. The oxides of X, Y and Z, respectively, are basic, amphoteric and acidic, The correct order of the atomic numbers of X, Y and Z is :

A. $X < Y < Z$

B. $Y < X < Z$

C. $Z < Y < X$

D. $X < Z < Y$

Answer:

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193. Which one of the following complex is not expected to exhibit isomerism

A. $\left[Ni(NH_3)_4(H_2O)_2\right]^{2+}$

B. $\left[Ni(en)_3\right]^{2+}$

C. $\left[Pt(NH_3)_2Cl_2)\right]$

D. $\left[Ni(NH_3)_2Cl_2\right]$

Answer:

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194. Amongst the following statements regarding adsorption, those that are valid are :

(a) ΔH becomes less negative as adsorption proceeds.

(b) On a given adsorbent, ammonia is adsorbed more than nitrogen

gas.

(c) On adsorption, the residual force acting along the surface of the adsorbent increases.

(d) With increase in temperature, the equilibrium concentration of adsorbate increases.

A. (b) and (c)

B. (c) and (d)

C. (a) and (b)

D. (d) and (a)

Answer:

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195. The molecular geometry of SF_6 is octahdral. What is the geometry of SF_4 (including lone pair(s) of electrons, if any) ?

A. Pyramidal

B. Trigonal bipyramidal

C. Tetrahedral

D. Square planar

Answer:

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196. In a saturated acyclic compound the mass ration of C:H is 4:1 and C:O is 3:4. find the no. of moles of O_2 required to react with 2 moles compound to give CO_2 and water.

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197. For the disproportionation reaction $2Cu^+(aq) \Leftrightarrow Cu(s) + Cu^{2+}(aq)$ at K, In K (where K is the

equilibrium constant) is _____ $\times 10^{-1}$.

Given : $\left(E^{\circ}_{Cu^{2+}/Cu^{+}} = 0.16V \text{ and } E^{\circ}_{Cu^{+}/Cu} = 0.52V\right)$

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198. The work function of sodium metal is $4.41 \times 10^{-19} J$. If photons of wavelength 300 nm are incident on the metal, the kinetic energy of the ejected electrons will be $\left(h = 6.63 \times 10^{34} Js, c = 3 \times 10^{8} \text{ m/s}\right.$ _____ $\times 10^{-21}$

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199. The oxidation states of transition metal atoms in $K_2Cr_2O_7$, $KMnO_4$ and K_2FeO_4, respectively, are x, y and z. The sum of x, y and z is _____.

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200. The heat of combustion of ethanol into carbon dioxide and water is –327 kcal at constant pressure. The heat evolved (in cal) at constant volume and $27^{\circ}C$ (if all gases behave ideally) is (R = 2 cal $mol^{-1}K^{-1}$ _____.

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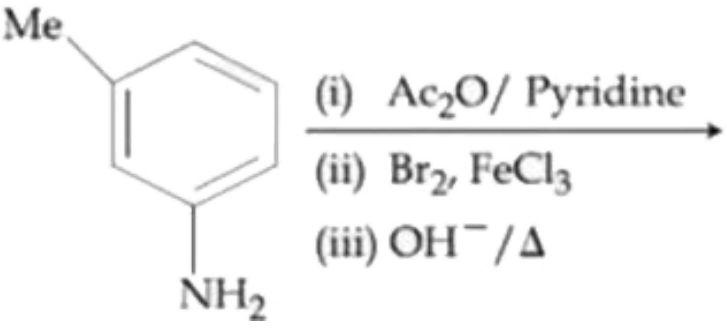
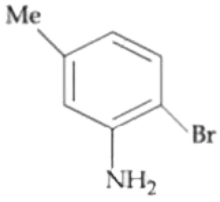
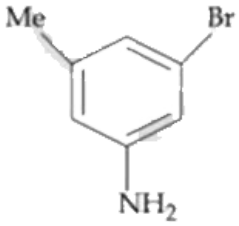
201. The final major product of the following reaction is :

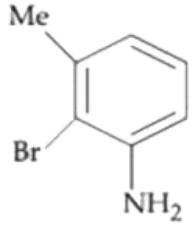


A. 

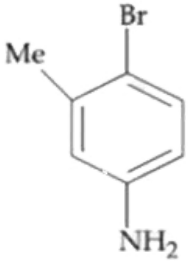
B.



C.



D.



Answer:

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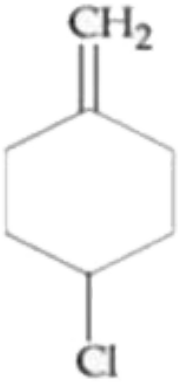
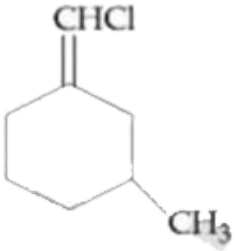
202. Among the following compounds geometrical isomerism is exhibited by :

A.



B.



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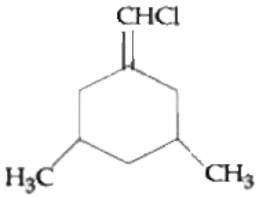

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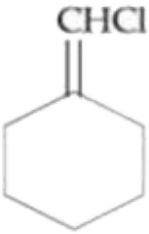

Answer:

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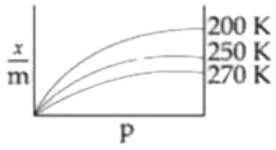
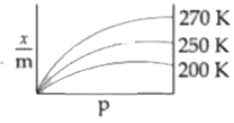
203. Adsorption of gas follows Freundlich adsorption isotherm. If x is the mass of the gas adsorbed on mass m of the adsrobent , the correct plot of $\frac{x}{m}$ versus p is :

A.



B.



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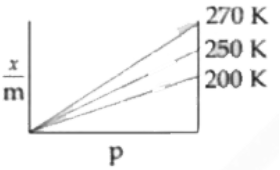
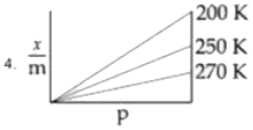


D.



Answer:

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204. An element crystallises in a face -centred cubic (fcc) unit cell with cell edge a. The distance between the centre of two nearest octahedral voids in the crystal lattice is ::

A. $\frac{a}{\sqrt{2}}$

B. a

C. $\sqrt{2}a$

D. $\frac{a}{2}$

Answer:

Watch Video Solution

205. Consider the complex ions ,

trans $-\left[Ce(en)_2Cl_2\right]^+(A)$ and

cis $-\left[Co(en)_2Cl_2\right]^+$ (B) . The correct statement regarding them is :

A. both (A) and (B) cannot be optically active

B. (A) canbe optically active , but (B) cannot be optically active

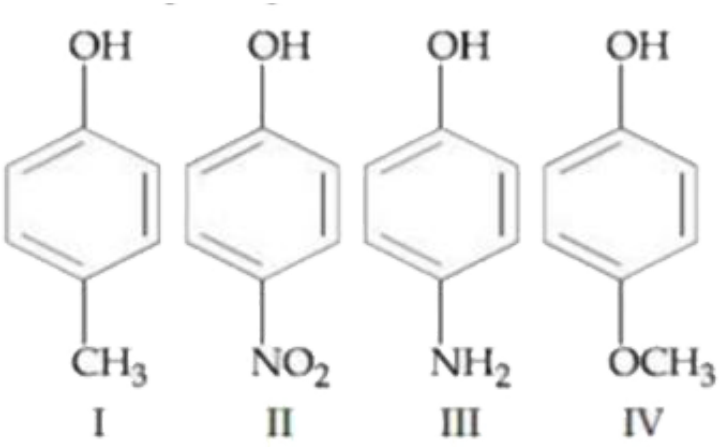
C. both (A) and (B) can be optically active

D. (A) cannot be optically active , but (B) can be optically active.

Answer:

Watch Video Solution

206. The increasing order of boiling points of the folloiwng compounds is :



A. $I < III < IV < II$

B. $I < IV < III < II$

C. $IV < I < II < III$

D. $III < I < II < IV$

Answer:

Watch Video Solution

207. The correct order of the ionic radii of $O^{-2}, N^{3-}, F^{-}, Mg^{2+}, Na^{+}$ and Al^{3+} is .

A. $N^{3-} < O^{2-} < F^{-} < Na^{+} < Mg^{2+} < Al^{3+}$

B. $Al^{3+} < Na^{+} < Mg^{2+} < O^{2-} < F^{-} < N^{3-}$

C. $Al^{3+} < Mg^{2+} < Na^{+} < F^{-} < O^{2-} < N^{3-}$

D. $N^{-3-} < F^{-} < O^{2-} < Mg^{2+} < Na^{+} < Al^{3+}$

Answer:

Watch Video Solution

208. Which one of the following polymers in not obtained by condensation polymerisation ?

A. nylon 6,6

B. buna - N

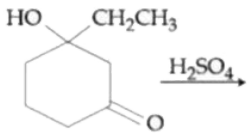
C. bakelite

D. nylon 6

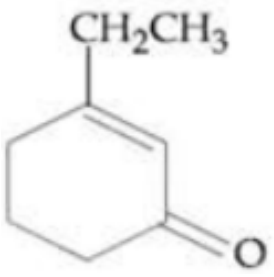
Answer:

Watch Video Solution

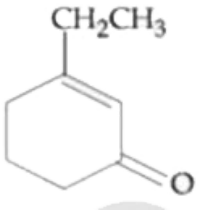
209. The major product of the following reaction is :



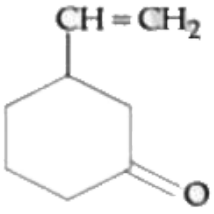
A.

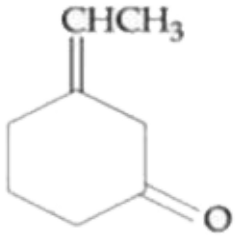


B.



C.





D.

Answer:

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210. Hydrogen peroxide , in the pure state is

A. non polar and almost colorless

B. linear and blue in color

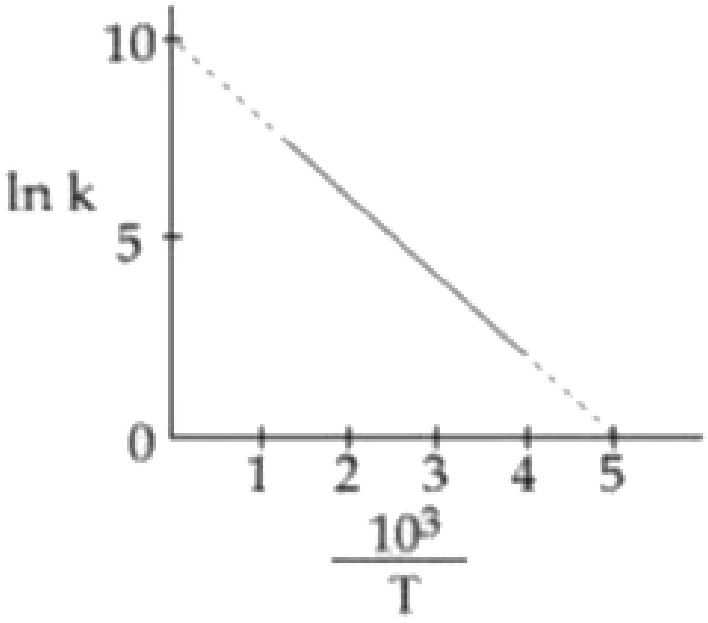
C. linear and almost colorless

D. planar and blue in color

Answer:

Watch Video Solution

211. The rate constant (k) of a rection is measured different temperatures (T) , and the data are plotted in the given figure . The activation energy of the reaction in $kJ\text{mol}^{-1}$ is : (R is gas constant)



A. 2/R

B. 1/R

C. R

D. 2R

Answer:

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212. Lattice enthalpy and enthalpy of solution of NaCl are 788 $kJ\text{mol}^{-1}$ and $4kJ\text{mol}^{-1}$ respectively. The hydration enthalpy of NaCl is

A. $-780kJ\text{mol}^{-1}$

B. $780kJ\text{mol}^{-1}$

C. $-784kJ\text{mol}^{-1}$

D. $784kJ\text{mol}^{-1}$

Answer:

Watch Video Solution

213. The one that is NOT suitable for the removal permanent hardness of water is:

A. Clark's method

B. Ion exchanged method

C. Calgon's method

D. Treatment with sodium carbonate

Answer:

Watch Video Solution

214. The compound that has the largest H-M-H bond angle (M = N, O, S, C) is :

A. H_2O

B. NH_3

C. H_2S

D. CH_4

Answer:

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215. Boron and silicon of very high purity can be obtained through :

A. liquation

B. zone refining

C. vapour phase refining

D. electrolytic refining

Answer:

Watch Video Solution

216. The correct statement about probability density (except at infinite distance from nucleus) is :

A. it can be zero for 1s orbital

B. it can be negative for 2p orbital

C. it can be zero for 3p orbital

D. it can never be zero for 2s orbital

Answer:

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217. The major product formed in the following reaction is :

$$CH_3CH = CHCH(CH_3)_2 \xrightarrow{HBr}$$

A. $CH_3CH(Br)CH_2CH(CH_3)_2$

B. $CH_3CH_2CH(Br)CH(CH_3)_2$

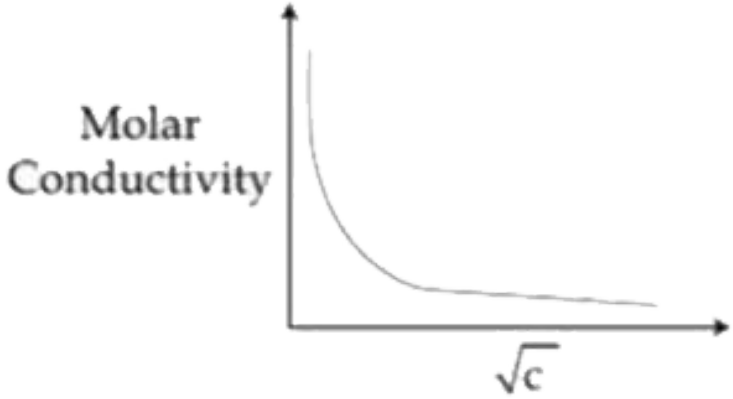
C. $Br(CH_2)_2CH(CH_3)_2$

D. $CH_3CH_2CH_2C(Br)(CH_3)_2$

Answer:

Watch Video Solution

218. The variation of molar conductivity wih concentration of an electrolyte (X) in aqueous solution is shown in the given figure .



The electrolyte X is :

A. HCl

B. NaCl

C. KNO_3

D. CH_3COOH

Answer:

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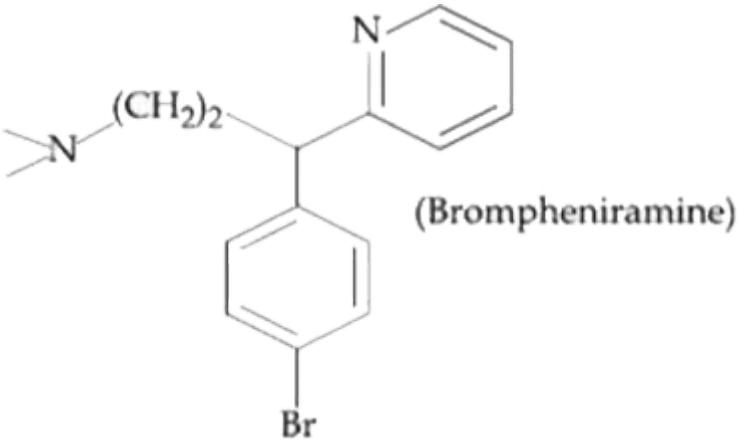
219. The following molecule acts as an :



A. Antiseptic

B. Anti-depressant

C. Anti-bacterial

D. Anti-histamine

Answer:

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220. The products formed by reaction of ammonia with excess of chlorine are:

A. NH_4Cl and N_2

B. NH_4Cl and HCl

C. NCl_3 and NH_4Cl

D. NCl_3 and HCl

Answer:

Watch Video Solution

221. 0.02M $K_2Cr_2O_7$ is treated with 0.288 g of ferrous oxalate. How much volume of $K_2Cr_2O_7$ is required ?

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222. For a demerization reaction ,

$2A(g) \rightarrow A_2(g)$

at 298 K, $\Delta U(\Theta) = -20kJ\text{mol}^{-1}, \Delta S^{\Theta} = -30JK^{-1}\text{mol}^{-1}$, then the ΔG^{Θ} will be _____J.

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223. Considering that $\Delta_0 > P$, the magnetic moment (in BM) of $\left[Ru(H_2O)_6\right]^{2+}$ would be _____.

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224. For a reaction X+Y = 2Z , 1.0 mo of X 1.5 mol of Y and 0.5 mol of Z where taken in a 1L vessel and allowed to react . At equilibrium , the concentration of Z was $1.0 mol L^{-1}$. The equilibrium constant of the reaction is _____ $\frac{x}{15}$. The value of x is _____.

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225. The number of chiral corbons present in sucrose is _____.

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Chemsitry

1. The correct statement with respect to dinitrogen is :

A. N_2 is paramagnetic in nature.

B. It can combine with dioxygen at $25^\circ C$

C. liquid dinitrogen is not used in cryosurgery.

D. it can be used as an inert diluent for reactive chemicals.

Answer:

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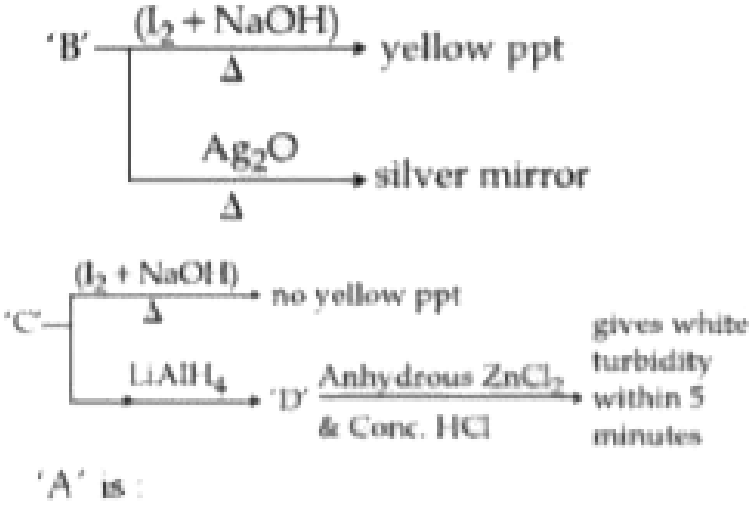
2. Consider the following reactions :

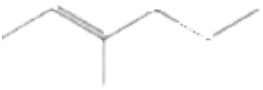


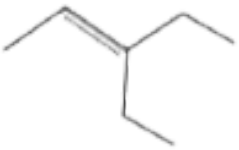
'A' is :

A. 

B. 

C.





D.

Answer:

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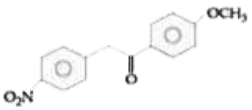
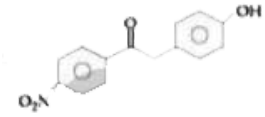
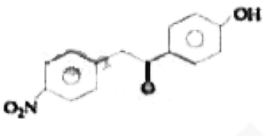
3. The major product obtained from the following reaction is :

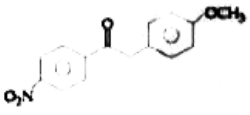
A.



B.



C. 

D. 

Answer:

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4. A solution of two components containing n_1 moles of 1^{st} component and n_2 moles of the 2^{nd} component is prepared . M_1 and M_2 are the molecular weights of component 1 and 2 respectively . If d is the density of the solution in gmL^{-1} , C_2 is the molarity and x_2 is the mole fraction of the 2^{nd} component , then C_2 can be expressed as :

A. $C_2 = \dfrac{1000x_2}{M_1 + x_2(M_2 - M_1)}$

B. $C_2 = \dfrac{dx_2}{M_1 + x_2(M_2 - M_1)}$

C. $C_2 = \frac{1000dx_2}{M_1 + x_2(M_2 - M_1)}$

D. $C_2 = \frac{dx_1}{M_2 + x_2(M_2 - M_1)}$

Answer:

Watch Video Solution

5. The INCORRECT statement is :

A. bronze is an alloy of copper and tin

B. cast iron is used to manufacture wrought iron.

C. german silver is an alloy of zinc, copper and nickel

D. brass is an alloy of copper and nickel

Answer:

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6. Consider the Assertion and Reason given below.

Assertion (A) : Ethene polymerized in the presence of Ziegler Natta Catalyst at high temperature and pressure is used to make buckets and dustbins.

Reason (R) : High density polymers are closely packed and are chemically inert.

Choose the correct answer from the following :

A. (A) is correct but (R) is wrong .

B. Both (A) and (B) are correct but (R) is not the correct explanation of (A)

C. Both (A) and (B) are correct and (R) is the correct explanation of (A),

D. (A) are (R) both are wrong.

Answer:

Watch Video Solution

7. Arrange the following solutions in the decreasing order of pOH :

(A) 0.01 M HCl

(B) 0.01 M NaOH

(C) 0.01 M CH_3COONa

(D) 0.01 M NaCl

A. (A) $> (C) > (D) > (B)$

B. $(A) > (D) > (C) > (B)$

C. $(B) > (C) > (D) > (A)$

D. $(B) > (D) > (C) > (A)$

Answer:

Watch Video Solution

8. Among the sulphates of alkaline earth metals the solubilities of $BeSO_4$ and $MgSO_4$ in water, respectively , are :

A. poor and poor

B. high and poor

C. high and high

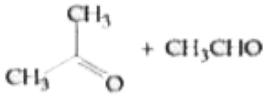
D. poor and high

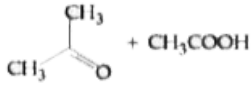
Answer:

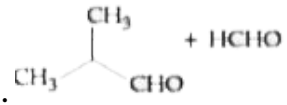
Watch Video Solution

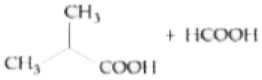
9. The major products of the following reaction are :

$$CH_3-\underset{\displaystyle CH_3}{\overset{|}{C}}H-\underset{\displaystyle OSO_2CH_3}{\overset{CH-CH_3}{|}} \xrightarrow[(ii)\,O_3/H_2O_2]{(i)\,KO^tBu/\,\Delta}$$

A. 

B. 

C. 

D. 

Answer:

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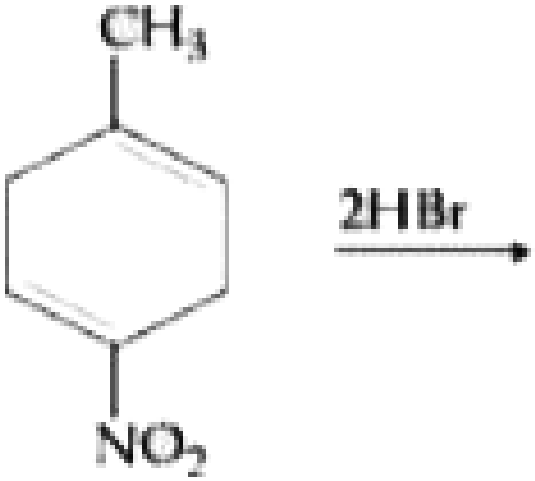
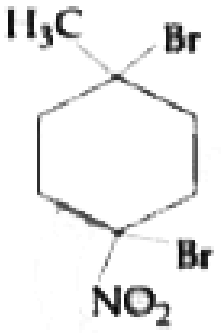
10. The major product of the following reaction is :



A.



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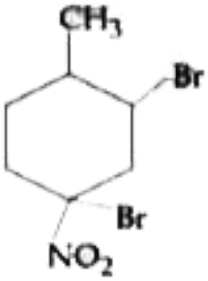

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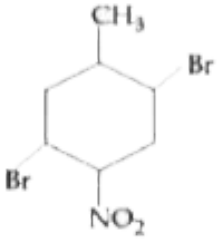
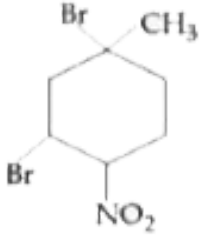


D.



Answer:

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11. The presence of soluble fluoride ion upto 1 ppm concentration in drinking water , is :

A. harmful for teeth

B. harmful to skin

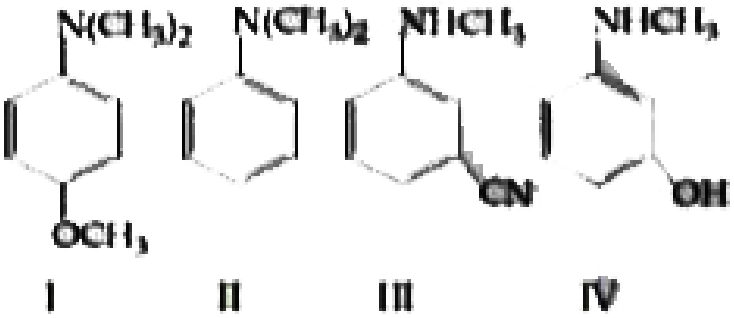
C. harmful to bones

D. safe for teeth

Answer:

Watch Video Solution

12. The increasing order of pK_b values of the following compounds is :



A. $II < IV < III < I$

B. $I < II < IV < III$

C. $II < I < III < IV$

D. $I < II < III < IV$

Answer:

Watch Video Solution

13. Which of the following compounds shows geometrical isomerism ?

A. 2-methylpent-2-ene

B. 4-methylpent-2-ene

C. 4-methylpent-1-ene

D. 2-methylpent-1-ene

Answer:

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14. The set that contains atomic numbers of only transition elements , is :

A. 37,42,50,64

B. 21,25,42,72,

C. 9,17,34,38,

D. 21,32,53,64

Answer:

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15. The variation of equilibrium constant with temperature is given below :

Temperature	Equilibrium Constant
$T_1 = 25^\circ C$	$K_1 = 10$
$T_2 = 100^\circ C$	$K_2 = 100$

The values of ΔH°, ΔG° at T_1 and $\Delta G_\circ$ and T_2 (in KJ mol^{-1}) respectively , are close to [use R= 8.314 J k^{-1} mol^{-1}]

A. 28.4 , -7.14 and -5.71

B. 0.64 , -7.14 and -5.71

C. 28.4 , -5.71 and -14.29

D. 0.64 , -5.71 and -14.29

Answer:

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16. Kraft temperature is the temperature :

A. below which the aqueous solution of detergent starts freezing .

B. below which the formation of micelles takes place .

C. above which the aqueous solution of detergents starts boiling .

D. above which the formation of miscelles takes place .

Answer:

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17. For the reaction

$$Fe_2N(s) + \frac{3}{2}H_2(g) = 2Fe(s) + NH_3(g)$$

A. $K_c = K_p(RT)$

B. $K_c = K_p(RT)^{\frac{-1}{2}}$

C. $K_c = K_p(RT)^{\frac{1}{2}}$

D. $K_c = K_p(RT)^{\frac{3}{2}}$

Answer:

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18. The species that has a spin -only magnetic moment of 5.9 BM , is : (T_d= tetrahedral)

A. $\left[Ni(CN)_4\right]^{2-}$ (square planar)

B. $[NiCl_4]^{2-}(T_d)$

C. $Ni(CO)_4(T_d)$

D. $[MnBr_4]^{2-}(T_d)$

Answer:

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19. The lanthanoid that does NOT show +4 oxidation stat is :

A. Dy

B. Ce

C. Eu

D. Tb

Answer:

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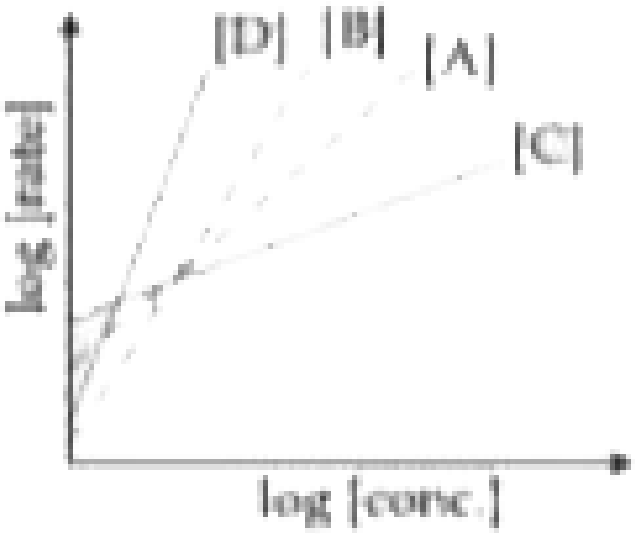
20. Consider the following reaction

$A \to P1, B \to P2, C \to P3, D \to P4,$

The order of the above reaction are a,b,c and d, respectively . The following graph is obtained when log [rate] vs. log [conc.] are plotted :



Among the following the correct sequence for the order of the reaction is :

A. $d > a > b > c$

B. $a > b > c > d$

C. $c > a > b > d$

D. $d > b > a > c$

Answer:

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21. In an estimation of bromine by Carius method , 1.6 g of an organic compound gave 1.88 g of AgBr . The mass percentage of bromine in the compound is _____

(Atomic mass , Ag=108 , Br = 80 g mol^{-1})

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22. Potassium chlorate is prepared by the electrolusis of KCl in basic medium as:

$Cl^- + 6OH^- \rightarrow ClO_3^- + 3H_2O + 6e$

If only $60\,\%$ of current is utilised in the reaction, the time to produce $10g$ of $KClO_3$ using current of 2 ampere : $(mol.\,wt.$ of $KClO_3 = 122.5)$

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23. The number of Cl=O bonds is perchloric acid is , "_____".

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24. The elevation of boiling point of 0.10 m aqueous $CrCl_3.xNH_3$ solution is two times that of 0.05 m aqueous $CaCl_2$ solution . The value of x is _____

[Assume 100% ionisation of the complex and $CaCl_2$, coordination number of Cr as 6 , and that all NH_3 molecules are present inside the coordination sphere]

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25. A spherical balloon of radius 3 cm containing helium gas has a pressure of 48×10^{-3} bar . At the same temperature , the pressure , of a spherical balloon of radius 12 cm containing the same amount of gas will be _____ $\times 10^{-6}$ bar

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