



CHEMISTRY

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

QUESTION PAPER 2019

Chemistry

1. The maximum number of electrons that can have the set of quantum numbers, $n = 4$, $m_l = 0$ and $m_s = \frac{1}{2}$ is

A. 3

B. 4

C. 5

D. 6

Answer: B

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2. Which of the following pairs has the identical e/m value ?

A. An α - particle and deuterium ion

B. A proton and neutron

C. An electron and γ -rays

D. A proton and deuterium ion

Answer: A

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3. The reason for a cation to be smaller than its parent atom is

A. repulsion between the electrons of outer orbit

B. Increased electrostatic attraction between nucleus and electrons.

C. increase in the mass of the cation compared to neutral atom.

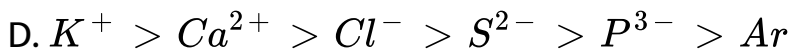
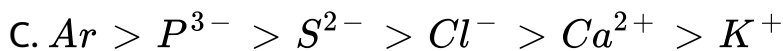
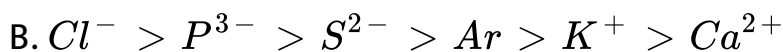
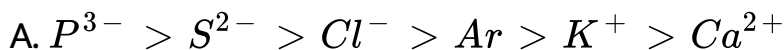
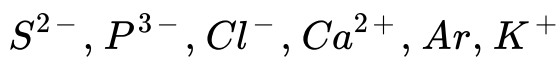
D. change in the number of protons of cation compared to neutral atom.

Answer: B



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4. Arrange the following in the decreasing order of radius.



Answer: A



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5. Which of the following compounds has the highest dipole moment (D) ?

A. HBr

B. CH_3COCH_3

C. H_2S

D. $COCl_2$

Answer: B

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6. Match the following :

List I (Hybridisation)		List II (Compound/ion)	
A. sp^3d	I.	$[PtCl_4]^{2-}$	
B. sp^3d^2	II.	SF_6	
C. dsp^2	III.	BCl_3	
D. dsp^3	IV.	PCl_6	
	V.	ClF_3	

The correct match is

- A. A B C D
 IV II I V
- B. A B C D
 IV V II I
- C. A B C D
 II IV I III
- D. A B C D
 I III IV V

Answer: A



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7. The nitrogen gas pressure inside a container of volume 2.6cm^3 is 2.3 atm at 27°C . The approximate number of moles of nitrogen present in the container is

$$[R = 0.0821 \text{ L atm mol}^{-1} \text{K}^{-1}]$$

A. 4×10^{-3}

B. 1.7×10^{-4}

C. 4×10^{-4}

D. 2×10^{-4}

Answer: D

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8. Which of the following statements is not correct regarding kinetic theory of gases?

A. Gases are considered as point masses

B. Kinetic energy of gas molecules increases with temperature

C. Total energy of molecules before and after the collisions is different

D. The distribution of molecular speed of a gas remains constant at a particular temperature

Answer: C

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9. A spherical ball of radius 7 cm contains 56 w % iron. Find out the number of moles of iron present approximately in the ball ?

($d = 1.4\text{gcm}^{-3}$, atomic mass = 56gmol^{-1})

A. 15.1

B. 20.1

C. 25.1

D. 35.1

Answer: B



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10. One third litre of $xMK_2Cr_2O_7$ is required to completely oxidise 2L of 0.1 M ferrous ammonium sulphate in acid medium. What is x ?

A. 0.03

B. 0.1

C. 0.2

D. 0.5

Answer: B



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11. Enthalpy change for freezing of 1 g of water at 1 bar and $0^{\circ}C$ is 334 J. Calculate the internal energy change in J when 1 g of water is converted into ice ?

A. 205

B. 334

C. 0

D. 668

Answer: B



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12. For a chemical reaction, the standard Gibbs energy change, ΔG° is $-7.64 \times 10^4 \text{ J mol}^{-1}$. What is the value of equilibrium constant (K) ?

A. $K = 1$

B. $K > 1$

C. $K < 1$



D. $K = 0$

Answer: B



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13. Match the following :

	List I (Acid)		List II (K_a)
A.		I.	1×10^{-13}
B.		ii.	3.0×10^{-5}
C.	HClO	iii.	1.0×10^{-10}
D.	CH ₃ COOH	IV.	6.5×10^{-5}
		V.	1.75×10^{-5}

The correct match is

- A.

A	B	C	D
I	II	III	IV

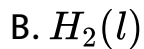
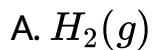
- B. A B C D
III V II I
- C. A B C D
III IV II V
- D. A B C D
I IV V II

Answer: C



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14. The heat of combustion (kJ mol^{-1}) is highest for



C. LPG



Answer: C



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15. What is the bonding nature in LiCl bond

- A. Pure ionic
- B. Pure covalent
- C. Coordinate bond
- D. Ionic and covalent

Answer: D



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16. Which of the following statements is/are correct for group 13 elements ?

A. Al reacts with dil. HCl to liberate H_2 gas

B. Al reacts with conc. HNO_3 to liberate H_2 gas

C. Boron reacts with only acids to liberate H_2 gas

D. Anhydrous $AlCl_3$ reacts with moisture to liberate H_2 gas

A. B, C, D

B. A, B, D

C. A, C

D. A

Answer: D



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17. If one wants to make methanol out of synthesis gas. What should be the ratio of the gaseous components in the synthesis gas ?

A. 1:2

B. 1:1

C. 1:3

D. 3:1

Answer: A



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18. The irritant red haze in traffic and congested places is due to

A. CO_2

B. O_3

C. SO_x (oxides of sulphur)

D. NO_x (oxides of nitrogen)

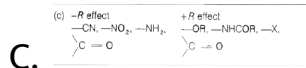
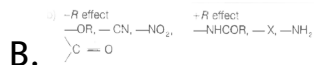
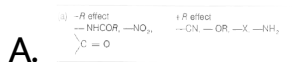
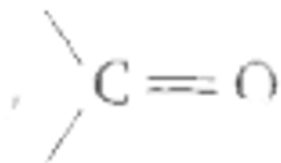
Answer: D



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19. Identify the atoms or groups from the following that exhibit - R effect and +R effect when present on benzene ring :

$-OR$, $-NHCOR$, $-CN$, $-X$, $-NO_2$, $-NH_2$,



Answer: D



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20. A hydrocarbon with molecular formula, C_4H_6 undergoes the following reactions :

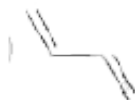
A. Decolourised molecular bromine.

B. Reacted with HBr.

C. Addition of ozone and then cleavage of the ozonide by

Zn / H_2O gave the product $C_4H_6O_2$.

Then, the structure of the hydrocarbon is



A.

B. $CH_3CH_2C \equiv CH$



C.

D. 

Answer: B::C



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21. The order of stability of below resonance structures is



A. II > I > III

B. I > II > III

C. III > II > I

D. I > III > II

Answer: B



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22. Match the following :



The correct answer is

- A. A B C D
V III I II
- B. A B C D
III IV II I
- C. A B C D
IV II V I
- D. A B C D
IV II I V

Answer: A

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23. Calculate the depression in the freezing point of a solution containing 0.1 g of $K_3[Fe(CN)_6]$ in 100 g of H_2O ? (molecular weight of

$$K_3[Fe(CN)_6] = 329, K_f = 1.86K \text{ kg mol}^{-1})$$

A. 0

B. 1.223

C. 0.0226

D. 0.226

Answer: C



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24. A solution of 17.1 w% of sucrose (molar mass = 342 g mol^{-1}) is isotonic with a x w% solution of oxalic acid (molar mass = 90 g mol^{-1}). Assume the degree of dissociation of oxalic acid as 0.01. What is x ?

A. 9

B. 0.45

C. 4.41

D. 0.90

Answer: C



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25. Consider the systems having liquid-solid interface, (a) copper wire in silver nitrate solution and (b) silver wire in copper sulphate solution.

Predict which interface will show spontaneous reaction, if

$$E_{Cu^{2+}/Cu}^{\circ} = 0.34V \text{ and } E_{Ag^{+}/Ag}^{\circ} = 0.80V ?$$

A. Copper-silver nitrate interface

B. Silver-copper sulphate interface

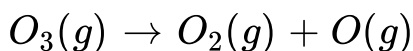
C. There will be no spontaneous reaction

D. Both interfaces will give spontaneous reaction

Answer: A

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26. The decomposition of $O_3(g)$ follows first order kinetics and is given by



The rate constant for this reaction is $1.0 \times 10^{-3} s^{-1}$. The initial pressure of $O_3(g)$ is 100 atm.

What will be the partial pressure (in atm) of O_3 , O_2 , O respectively after 38.38 minutes ?

A. 95, 5, 5

B. 10, 90, 0

C. 10, 90, 90

D. 10, 0, 90

Answer: C



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27. Identify the correct statements from the following :

(i) A closed vessel containing 90% CO_2 and 10% O_2 is an aerosol.

(ii) Milk is an emulsion.

(iii) Smoke is an aerosol.

(iv) Peptisation is a method of purification of colloidal solution.

(v) Ultrafiltration is a method of purification of colloidal solution.

A. (i), (ii), (iii)

B. (i), (iii), (iv)

C. (ii), (iii), (v)

D. (i), (ii), (v)

Answer: C



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28. Statement (A) Mg can reduce Al_2O_3 above $1350^\circ C$.

Statement (B) Al can reduce MgO below $1350^\circ C$.

The correct answer is

A. Both (A) and (B) are wrong.

B. (A) is correct, but (B) is wrong.

C. (A) is wrong, but (B) is correct.

D. Both (A) and (B) are correct.

Answer: A

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29. Match the following :



The correct answer is

A. A B C D
 I II III IV

B. A B C D
 II IV III I

- C. A B C D
 I IV III V
- D. A B C D
 II III IV V

Answer: D

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30. XeF_4 is square planar while XeF_6 has a distorted octahedral structure. What is the correct explanation for this observation ?

- A. Both molecules have one lone pair of electrons
- B. Both molecules have two lone pairs of electrons
- C. XeF_4 does not have any lone pair of electrons,
 XeF_6 has one lone pair of electrons on Xe

D. XeF_4 has two lone pairs of electrons on Xe, XeF_6

has one lone pair of electrons on Xe

Answer: D



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31. Match the following :



The correct answer is

A. A B C D
 V II VI IV

B. A B C D
 V I IV III

C. A B C D
 VI I V IV

D. A B C D
 IV II V III

Answer: A



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32. The name of the compound

$[Ag(NH_3)_2][Ag(CN)_2]$ is

- A. dicyanoargentate (I) diammino (I) silver
- B. diamino silver dicyanate
- C. diammine silver (I) dicyanoargentate (I)
- D. silver diamminedicyano argentate

Answer: C



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33. Match the following :

List I	List II
A. $-\left(\text{CH}_2-\underset{\text{Cl}}{\text{C}}=\text{CH}-\text{CH}_2\right)_n-$	i. Cross-linked network
B. Nylon-6, 6	ii. Elastomer
C. HDP	iii. Fibre
D. Melamine-formaldehyde	iv. Ziegler-Natta catalyst

The correct answer is

- A. A B C D
IV III II I
- B. A B C D
II III IV I
- C. A B C D
III II I IV
- D. A B C D
I IV III II

Answer: B

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34. Among the following B group vitamins, the deficiency of which one results in convulsions.

A. B_6

B. B_{12}

C. B_1

D. B_2

Answer: A



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35. Methacetin (4-methoxy-acetanilide) is ... drug.

A. an antipyretic

B. narcotic

C. an antiseptic

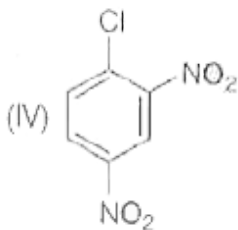
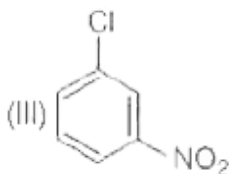
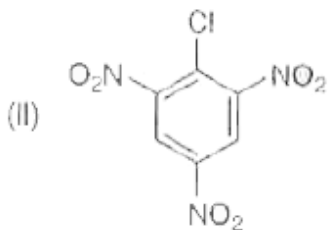
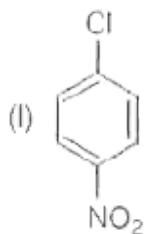
D. disinfectant

Answer: A



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36. Identify the correct order of reactivity of the following haloarenes on treatment with NaOH ?



A. III > I > IV > II

B. I > III > IV > II

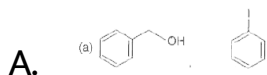
C. II > IV > I > III

D. II > III > IV > I

Answer: C

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37. In the following reaction, the major products are



Answer: B

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38. Identify the method that gives benzyl alcohol ?



B. 

C. 

D. 

Answer: C

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39. Statement (A) Carboxylic acid can be obtained by the reaction of $R - C \equiv N$ with $H_3\overset{\oplus}{O}$ under mild reaction conditions.

Statement (B) Hydrolysis of $R - C \equiv N$ in alkaline aqueous medium gives $R - COO\overset{\ominus}{N}\overset{\oplus}{a}$ and $\overset{\bullet\bullet}{N}H_3$ as products.

A. Both (A) and (B) are correct

- B. Both (A) and (B) are not correct
- C. (A) is correct, but (B) is not correct
- D. (A) is not correct but (B) is correct

Answer: D

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40. Benzaldehyde can be converted to benzonitrile by treatment with

- A. NH_3
- B. NH_3 followed by reaction with $C_6H_5SO_2Cl$
- C. NH_2OH followed by reaction with acetic anhydride
- D. NH_2OH

Answer: C



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41. The energy associated with Bohr's orbit in the hydrogen atom is given by the expression, $E_n = -\frac{13.6}{n^2} eV$. the energy in eV

associated with the orbit having a radius $9 r_1$ is (r_1 is the radius of the first orbit)

A. -13.6

B. -6.8

C. -15.1

D. -1.36

Answer: C



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42. When a certain metal was irradiated with light of frequency $40 \times 10^{16} \text{ s}^{-1}$, the photoelectrons emitted had four times kinetic energy as the kinetic energy of photoelectrons emitted when the same metal was irradiated with light of frequency $2.0 \times 10^{16} \text{ s}^{-1}$. the threshold frequency (ν_0) of the metal in s^{-1} is

A. 2×10^{16}

B. 4×10^{16}

C. 2.5×10^{16}

D. 1.33×10^{16}

Answer: D



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43. Which of the following statements are correct for classification of elements?

I. The properties of elements are periodic function of their atomic numbers.

II. Non-metallic elements are less in number than the metallic elements.

III. The first ionisation energies of elements along a period do not vary in a regular manner.

IV. The ground state electronic configuration of Pd ($Z = 46$) is $[\text{Kr}] 4d^{10} 5s^2$.

A. I,II,III, IV

B. I, II, III, only

C. II, III, IV only

D. I, II, IV only

Answer: B



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44. The changes in bond length with respect to N - N and O - O , when N_2 becomes N_2^+ and O_2 becomes O_2^+ are respectively

A. increases, decreases

B. decreases, increases

C. increases, increases

D. decreases, decreases

Answer: A

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45. Arrange the following species in the increasing order of long pairs of electrons.



A. $A < B < C < D$

B. $B < C < A < D$

C. $C < A < D < B$

D. $A < B < D < C$

Answer: D



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46. The ratio between RMS velocities of H_2 at 50 K and O_2 at 800 K is

A. 4:1

B. 2:1

C. 1:1

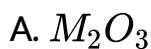
D. 1:4

Answer: C



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47. On reduction with hydrogen, 3.6 g of an oxide of metal (M) left 3.2 g of the metal. If the atomic weight of the metal is 64. the formula of the oxide is



Answer: B



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48. At 300 K, the equilibrium constant for a reaction is 10. the standard free energy change (in kJ mol^{-1}) for the

reaction is

A. -57.4

B. -115.2

C. $+57.4$

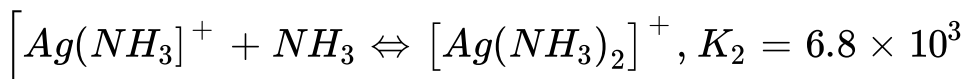
D. -5.74

Answer: D

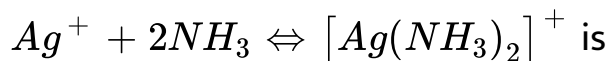


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49. Observe the following equations



the equilibrium constant for the following reaction,



A. 6.008×10^3

B. 1.088×10^7

C. 1.088×10^8

D. 1.028×10^3

Answer: B



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50. A buffer solution is prepared by mixing 10 mL of 1.0 M acetic acid and 20 mL of 0.5 M sodium acetate and then

diluted to 100 mL with distilled water, The pH of the buffer solution is (pK_a of acetic acid is 4.76)

A. 4.84

B. 5.21

C. 4.34

D. 4.76

Answer: D



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51. Identify the correct statements from the following

I. B_2H_6 is an electron deficient hydride.

II. NH_3 and electron rich hydride.

III. $YbH_{2.55}$ is an interstitial hydride.

A. I,II,III

B. II,III, IV

C. I,II, IV

D. I, III, IV

Answer: C



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52. Compound A is prepared by the electrolysis of aqueous solution of B using castner- Kellner cell with mercury as cathode and carbon as anode. A and B respectively are

A. NaOH, NaCl

B. NaCl, NaOH

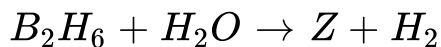
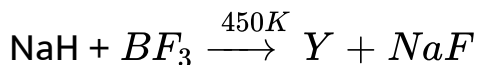
C. $NaHCO_3$, NaOH

D. Na_2CO_3 , NH_3

Answer: A

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53. In the following reactions:



X, Y and Z are respectively.

A. B_2H_6 , $LiBH_2$, H_3BO_3

B. $B_3N_3H_6$, B_2H_6 , H_3BO_3

C. $(BN)_n$, $LiBH_4$, HBO_2

D. B_2H_6 , B_2H_6 , HBO_2

Answer: B

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54. Consider the following statements:

I. In diamond, each carbon atom is sp^3 -hybridised.

II. Graphite has planar hexagonal layers of carbon atoms.

III. Silicones being surrounded by non-polar alkyl groups are water repelling in nature.

IV> The order of catenation in group 14

elements is $Si > C > Sn > Ge > Pb$.

The correct statements are

A. I,II,III

B. II,III, IV

C. I,II, IV

D. I, III, IV

Answer: A



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55. Which one of the following statements is not correct?

A. NO_2 is a lung irritant

B. The municipal sewage has BOD value of 100.4000 ppm

C. Main source of CO is automobile exhaust fumes

D. COD is the measure of bacteria in water

Answer: D



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56. The stability order of the following resonance structures is

A. $III < II < I$

B. $II > I > III$

C. $II < I < III$

D. $II > II > I$

Answer: A

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57. The product formed in the above reaction is



A. 

B. 

C. 

D. 

Answer: C

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58. The correct order of reactivity of the following compounds, towards electrophilic substitution reactions is



A. $A > B > C > D$

B. $D > C > B > A$

C. $C > B > A > D$

D. $B > C > A > D$

Answer: C

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59. Which one of the following statements is not correct?

A. Schottky defect in ionic solids does not change the density of the crystal

B. Packing efficiency is the percentage of total space filled by the particles

C. In body centered cubic unit cell, the relationship between atomic radius (r) and the edge length (a) is ,

$$r = \frac{\sqrt{3}}{4} a$$

D. Photovoltaic cell is used for conversion of light energy into electrical energy

Answer: A

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60. 1.2 mL acetic acid having density 1.06 g cm^{-3} is dissolved in 1 litre of water. The depression in freezing point observed for this concentration of acid was 0.041°C . The van't Hoff factor of the acid is

(K_f of water = $1.86 \text{ K kg mol}^{-1}$)

A. 0.41

B. 1.04

C. 0.96

D. 1.54

Answer: B



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61. 100 mL of 1.5% (w/v) solution of urea is found to have an osmotic pressure of 6.0 atm and 100 mL of 3.42% (w/v) solution of cane sugar is found to have an osmotic pressure of 2.4 atm. If the two solution are mixed the osmotic pressure of the resulting solution in atm is

Assume that there is no reaction between urea and cane sugar)

A. 8.4

B. 16.8

C. 4.2

D. 2.1

Answer: C



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62. The emf of the following cell

$\text{Mg} | \text{Mg}^{+2} (0.01\text{M}) || \text{Sn}^{+2} (0.1\text{M}) | \text{Sn}$ at 298 K in 'V' is

(Given, $E_{\text{Mg}^{+2}|\text{Mg}}^{\circ} = -2.34\text{V}$, $E_{\text{Sn}^{+2}|\text{Sn}}^{\circ} = -0.14\text{V}$)

A. 2.17

B. 2.23

C. 2.51

D. 2.45

Answer: B



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63. The reaction $X \rightarrow \text{products}$ is a first order reaction. In 40 minutes, the concentration of X changes from 1.0 M to 0.25 M. what is the initial rate of reaction when $[X] = 0.1 \text{ M}$?

$\log 4 = 0.60$)

A. $1.73 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

B. $3.47 \times 10^{-4} \text{ mol L}^{-1} \text{ min}^{-1}$

C. $1.73 \times 10^{-4} \text{ mol L}^{-1} \text{ min}^{-1}$

D. $3.45 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$

Answer: D



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64. Which of the following statements is not correct?

- A. both physical and chemical adsorptions are exothermic
- B. Physical adsorption takes place with decrease of free energy whereas chemical adsorption occurs with increase of free energy
- C. Physical adsorption requires low activation energy but chemical adsorption requires high activation energy
- D. The magnitude of chemical adsorption increases and that of physical adsorption decreases with rise in temperature

Answer: B



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65. Which one of the following statements is not correct ?

A. van-Arkel is method is used for refining of zinconlum

B. mond process is used for refining of nickel

C. zone refining is based on the principle that the impurities are more soluble in the melt than in the solid state of the metal

D. High melting metal are refined by equation

Answer: D



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66. Assertion (A) P_4O_1 cannot be used to remove moisture from ammonia gas. Reason (R) P_4O_{10} reacts with NH_3 gas.

The correct answer is

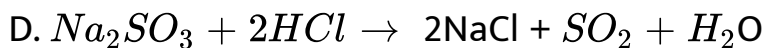
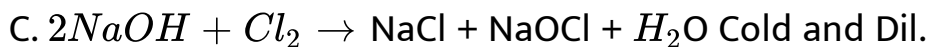
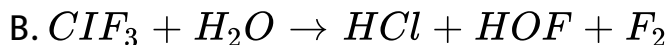
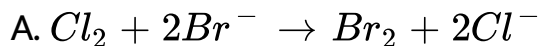
- A. Both A and (R) are correct and (R) is not the explanation of (A)
- B. Both A and (R) are correct and (R) is not the correct explanation of (A)
- C. (A) is correct but (R) is not correct
- D. (A) is not correct but (R) is correct .

Answer: A



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67. Which one of the following reactions does not occur?



Answer: B



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68. Which one of the following statements regarding helium is not correct?

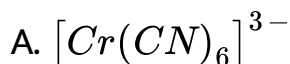
- A. It is used to fill gas balloons instead of hydrogen because it is lighter and not flammable
- B. It is used in gas cooled nuclear reactors
- C. It is used to produce and sustain powerful super conducting magnets
- D. It is not used as a cryogenic agent

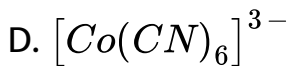
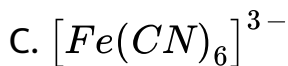
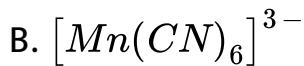
Answer: D



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69. Which one of the following coordination complexes exhibit the lowest value of magnetic moment (in BM)?



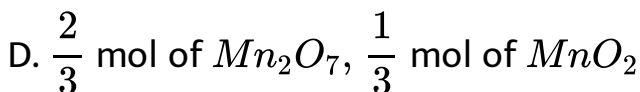
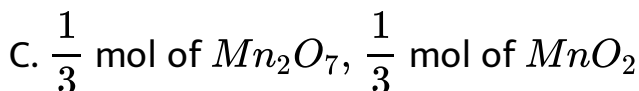
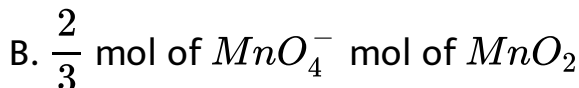
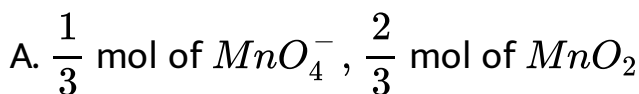


Answer: D



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70. Disproportionation products of one mole of MnO_4^{-2} in aqueous acidic medium are



Answer: B

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71. Match of the following:



A. $\begin{pmatrix} A & B & C & D \\ IV & III & V & I \end{pmatrix}$

B. $\begin{pmatrix} A & B & C & D \\ III & II & IV & I \end{pmatrix}$

C. $\begin{pmatrix} A & B & C & D \\ IV & III & II & I \end{pmatrix}$

D. $\begin{pmatrix} A & B & C & D \\ II & IV & III & V \end{pmatrix}$

Answer: A

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72. Which of the following statements about DNA is not correct ?

A. It has double helix structure

B. Adenine forms hydrogen bonds with thymine and
cytosine forms hydrogen bonds with guanine

C. The two strands in a DNA molecule are not
complementary to each other

D. It contains the pentose sugar, 2-deoxyribose

Answer: C



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73. Which of the following is not an analgesic ?

A. Ofloxacin

B. Paracetamol

C. Morphine

D. Codeine

Answer: A

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74. Which of the following statements are correct?

(A) The C - Cl bond in chlorobenzene is shorter than in chloromethane.

(B) It is difficult to replace chlorine from chlorobenzene

than from benzyl chloride.

The C - Cl bond in chlorobenzene has some double bond character.

(D) Chlorobenzene on chlorination gives m-dichlorobenzene

A. A, B, C

B. A, D only

C. B, C , D

D. C, D only

Answer: A



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75. Arrange the following in increasing order of acidic character.



A. $I < II < III < IV$

B. $I < IV < II < IV$

C. $IV < III < II < I$

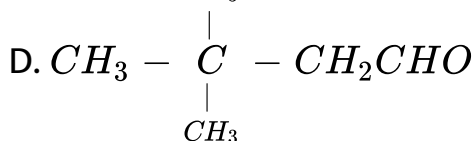
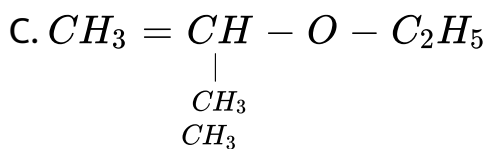
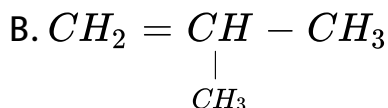
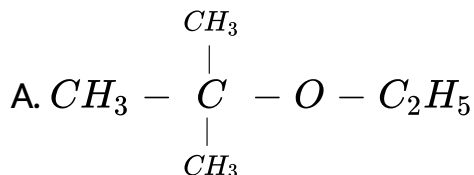
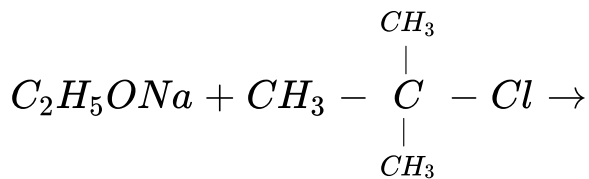
D. $II < III < IV < I$

Answer: B



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76. The major product obtained in the following reaction is

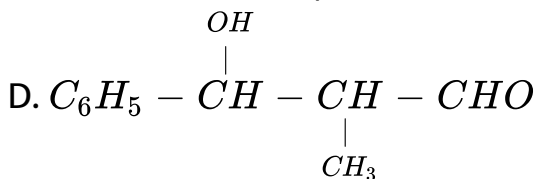
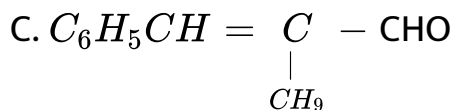
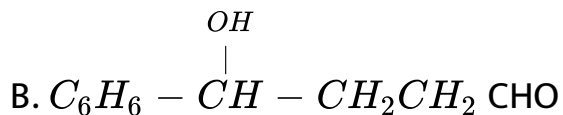
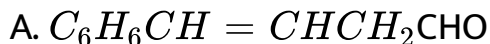
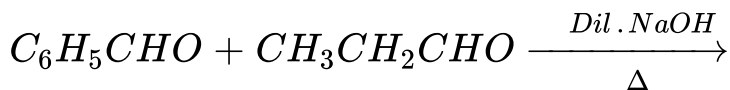


Answer: B



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77. The product of the following reaction is

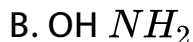


Answer: C



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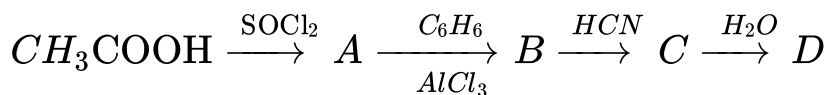
78. If general formula of oxime and semicarbazone is $C = N - Z$, What is 'Z' in oxime (I) semicarbazone (II) ?



Answer: C

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79. In the following reaction sequence, the product D is



A. 

B. 

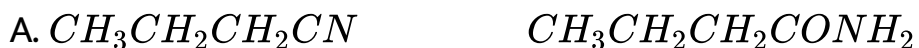
C. 

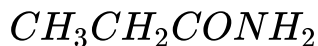
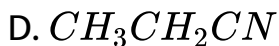
D. 

Answer: D

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80. Identify X and Y in the following reactions





Answer: B



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81. The work function (W_0) of Li, K, Mg, Ag and Cu are 2.42, 2.25, 3.70, 4.80 eV respectively. The number of metals which undergo photoelectric effect if a radiation of wavelength 540 nm falls on them is

(1 eV = 1.602×10^{-19} J)

A. 4

B. 2

C. 1

D. 3

Answer: C

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82. What is the mass of a particle with a wavelength of 3.313

Å moving with a speed of $2.0 \times 10^8 \text{ m s}^{-1}$?

A. $10 \times 10^{-28} \text{ kg}$

B. $2.0 \times 10^{-37} \text{ kg}$

C. $10 \times 10^{-37} \text{ kg}$

D. $2.0 \times 10^{-28} \text{ kg}$

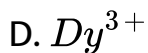
Answer: C

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83. If the electronic configuration of M^{3+} is $[Xe]4d^3$, then M^{3+} is



Answer: A



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84. Observe the following statements :

i. According to VSEPR theory, ClF_3 and SO_2 are shown AB_3E and AB_2E type molecules respectively.

(ii). SF_4 has "See-saw" shape.

iii. $HgCl_2$ and $PbCl_2$ have same shape.

The statements which are not correct are

A. i,ii only

B. i , iii only

C. i , ii, iii

D. ii, iii only

Answer: B

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85. Observe the following molecules : C_2 , N_2 , O_2 , F_2 Which one of the following statement is correct for the above molecules ?

- A. They exhibit same magnetic property
- B. They have same number of bonding molecular orbitals and same number of antibonding molecular orbitals
- C. The sequence of molecular orbitals is as follows
$$\sigma 2p_z < (\pi 2p_x = \pi 2p_y) < (\pi 2p_x) = \pi 2p_y < \sigma 2p_z$$
- D. They have same bond order

Answer: C



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86. The ratio of rates of diffusion of gases A and B is 1 : 0.707. IF the molecular weight of B is 32, the molecular weight of A is

A. 2

B. 64

C. 16

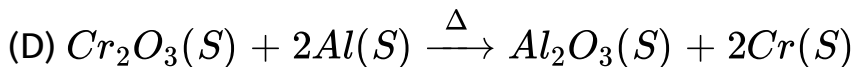
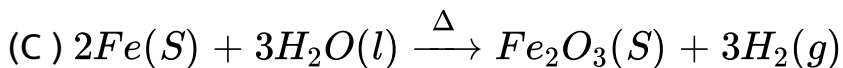
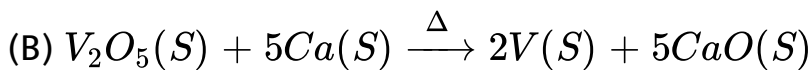
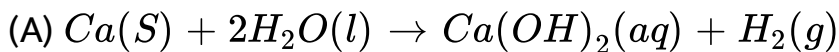
D. 8

Answer: D



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87. Which of the following are non-metal displacement reactions ?



A. A,B,C,D

B. B,C only

C. C,D only

D. A, C only

Answer: C



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88. Match the following :

List I	List II
(A) $\Delta U = W_{\text{ed}}$	I. Isothermal reversible expansion
(B) $\Delta U = q - W$	II. Wall is adiabatic
(C) $\Delta U = -q$	III. Thermally conducting walls
(D) $\Delta U = 0$	IV. Isolated system
	V. Closed system

The correct answer is

A. A - V, B - I, C - II, D - III

B. A-I, B- III, C - II, D - IV

C. A - II, B - V, C - III, D - I

D. A - II, B - V, C - I, D - III

Answer: B



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89. 18.4 g N_2O_4 was placed in 1 L vessel at 400 K and allowed to attain the following equilibrium $N_2O_4(g) \rightleftharpoons 2NO_2(g)$. IF the total pressure at equilibrium was 10.64 bar, approximate K_p is ($R = 0.083 \text{ L bar } K^{-1} \text{ mol}^{-1}$) (Assume N_2O_4 , NO_2 as ideal gases)

A. 57.20

B. 24.24

C. 14.30

D. 6.64

Answer: D



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90. If the pH of a buffer solution containing 0.1 M of monoacidic base and 0.01 M of its salt is 10.5, the pK_a of conjugate acid is

- A. 9.5
- B. 4.5
- C. 3.5
- D. 11.5

Answer: B

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91. Three vessels (A, B, C) contain H_2O_2 solution. In vessel A, 500 mL of 10 vol H_2O_2 is present. 100 mL of 3 vol H_2O_2 is

present in vessel B. Vessel C is filled with 250 mL of 2M H_2O_2 . The weight (in g) of H_2O_2 present in these vessels follows the order

A. $C > A > B$

B. $C > B > A$

C. $B > A > C$

D. $A > B > C$

Answer: D

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92. Identify correct statement from the following :

i. Beryllium oxide is an amphoteric oxide.

ii. Group II elements dissolve in liquid ammonia to form deep blue - black solutions.

iii. The hydration enthalpy of group II ions decreases from Be^{2+} to Ba^{2+} .

A. i,ii only

B. ii, iii only

C. i, iii only

D. i,ii, iii

Answer: D



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93. Identify correct statement from the following

- i. H_3BO_3 is a monobasic acid.
- ii. The correct formula of borax is $Na_2[B_4O_5(OH)_3] \cdot 8H_2O$.
- iii. $NaBH_4$ is a reducing agent.

A. i,ii, iii

B. i, ii only

C. ii, iii only

D. i, iii only

Answer: B



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94. Observe the following statements regarding C_{60} .

- i. All carbons are sp^2 - hybridised.
- ii. It contains 12 rings of five carbons each and 20 rings of six carbons each.
- iii. It is a non-aromatic compound.
- iv. It is pure form of carbon.
- v. C-C bond lengths in it are 143.5 and 138.5 pm.
- vi. It is prepared by heating graphite in an electric arc in the presence of oxygen.

The correct statements are

- A. i, ii, iii, iv, v
- B. i, ii, iii, iv, v only
- C. i, ii, iii, iv, vi only
- D. i, ii, iii only

Answer: D



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95. Identify the correct statements from the following :

i. In the presence of UV light , $CF_2Cl_2(g)$ gives chlorine free radicals which will react with $O_3(g)$ to form $O_2(g)$.

ii. Drinking water with 10 ppm fluoride is better than drinking water with 1 ppm fluoride.

iii. The maximum permissible concentration of lead in drinking water is 50 ppb.

A. i,ii,iii

B. i,ii only

C. ii,iii only

D. i,iii only

Answer: D

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96. Which of the following conversion represents Fries rearrangement ?

- A. O-acylated phenol to C - acylated phenol
- B. C - acylated phenol to O-acylated phenol
- C. N - acylated phenol to C - acylated phenol
- D. C - acylated phenol to N - acylated phenol

Answer: A



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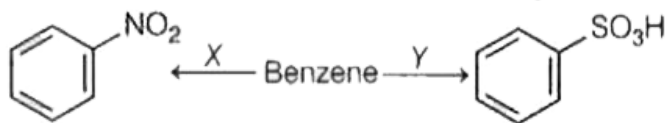
97. What are X and Y in the following reactions



	X	Y
(a)	$\text{CH}_3\text{CH}_2\text{CHO}$	$(\text{H}_3\text{C})_2\text{CO}$
(b)	$\text{CH}_3\text{CH}(\text{CH}_3)\text{COOH}$	CH_3COOH
(c)	$\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$	CH_3CHO
(d)	$\text{CH}_3\text{CH}(\text{CH}_3)\text{CHO}$	CH_3CHO

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98. What are X and Y in the following reactions



X	Y
(a) Conc. HNO_3	$\text{H}_2\text{SO}_4(\text{SO}_3)$
(b) Conc. HNO_3 + Conc. H_2SO_4 / 333 K	$\text{H}_2\text{SO}_4(\text{SO}_3)$
(c) $\text{NaNO}_2 / \text{HCl}$	H_2SO_4
(d) Dil. HNO_3	SO_3

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99. Which of the following statements are not correct ?

(A) Diode is a combination of n-type and p-type semiconductors.

(B) Silicon or germanium is electron rich impurity.

(C) Phosphorus and arsenic are electron deficient

impurities.

(D) Schottky defect decreases the density of the crystal.

A. B, C

B. A, D

C. C, D

D. A, C

Answer: A



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100. At 298 K, the vapour pressure of a solution of 7.5 g of non-volatile solute in 90 g of water is 2.8 kPa. If 18 g of water is added to this solution vapour pressure becomes solution

the vapour pressure becomes 2.81 kPa at same temperature,
the molar mass of solute in g mol^{-1} is

A. 17.5

B. 68.2

C. 71.5

D. 51.8

Answer: C



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101. At T (K), the vapour pressures of pure liquids A and B are 100 mm and 160 mm respectively. An ideal solution is formed by mixing 2 moles of A and 3 moles of B at the same

temperature. The mole fraction of A and B in the vapour state respectively are

A. 0.706, 0.294

B. 0.294, 0.706

C. 0.40, 0.60

D. 0.60, 0.40

Answer: B



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102. In which of the following cells, the space between cathode and anode is filled by a moist mixture of ammonium chloride and zinc chloride ?

- A. Mercury cell
- B. Leclanche cell
- C. Nickel-cadmium cell
- D. Fuel cell

Answer: B

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103. The rate equation for the reaction $2A + B \rightarrow$ products is $\text{rate} = k[A][B]^2$. If k at T (K) is $5.0 \times 10^{-6} \text{mol}^{-2} \text{L}^2 \text{s}^{-1}$, the initial rate of the reaction, when $[A] = 0.05 \text{molL}^{-1}$ and $[B] = 0.1 \text{molL}^{-1}$ is

A. $1.25 \times 10^{-9} \text{LmolL}^{-1} \text{s}^{-1}$

B. $1.25 \times 10^{-9} \text{ mol L}^{-1} \text{ s}^{-1}$

C. $2.50 \times 10^{-9} \text{ mol L}^{-1} \text{ s}^{-1}$

D. $2.50 \times 10^{-9} \text{ L mol L}^{-1} \text{ s}^{-1}$

Answer: C



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104. Which one of the following statements is not correct ?

A. The process of setting down of colloidal particles is coagulation

B. The mass in milligrams or lyophilic sol which protects the coagulates of 10 mL of a gold sol on adding 1 mL

of 10% NaCl solution is its gold number

C. The layer of positive or negative charge acquired by selective adsorption of ion on the surface of a colloidal particle is electrokinetic potential

D. The potential difference between the fixed layer on the colloidal particles and the diffused layer of opposite charge is zeta potential

Answer: C



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105. Identify the correct statement from the following :

i. In the extraction of Ag and Au, zinc is used as reducing

agent.

ii. Impure zinc can be refined by distillation method.

iii. Malachite is an ore of nickel.

A. i,ii,iii

B. i, ii only

C. ii, iii only

D. i, ii only

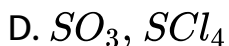
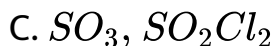
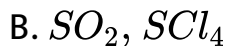
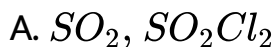
Answer: D



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106. White phosphorus reacts with sulphuryl chloride to form PCl_5 and X. Chlorine reacts with X in the presence of

wood charcoal to form Y. X and Y are respectively



Answer: A



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107. Identify the correct statements from the following :

i. Sulphuric acid is manufactured by contact process.

ii. SO_3 dissolves in H_2SO_4 to form pyrosulphuric acid.

iii. H_2SO_4 is used in the manufacture of fertilisers such as

ammonium sulphate and super phosphate.

iv. In the reaction,

$S + 2H_2SO_4(\text{Conc.}) \rightarrow 3SO_2 + 2H_2O$, H_2SO_4 is oxidised to SO_2 .

A. i,ii,iii, iv

B. i,ii, iv only

C. i,iii, iv only

D. i,ii,iii only

Answer: D



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108. Assertion (A) Helium has lowest boiling point (4.2 K).

Reason (R) The forces that exist between helium atoms are weak dispersion forces.

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

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

C. (A) is correct but (R) is false.

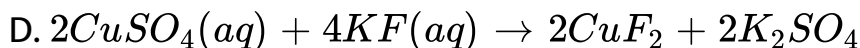
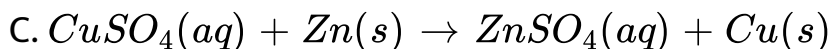
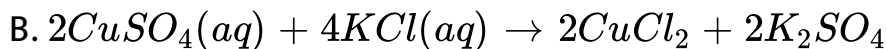
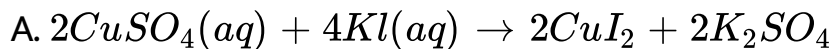
D. A is incorrect but (R) is correct

Answer: A



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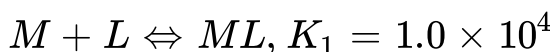
109. Which one of the following reactions does not take place ?

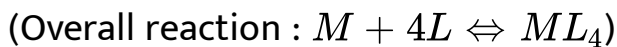
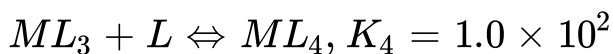
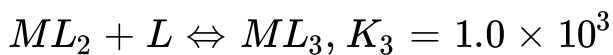
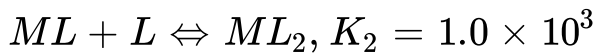


Answer: A

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110. The stepwise stability constants of a complex are given below. What is its overall reaction stability constant (β_4) ?





A. 1.0×10^{12}

B. 12.1×10^3

C. 1.0×10^6

D. 1.0×10^8

Answer: A



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111. Number average molecular mass of a polymer that contains 15 molecules with each of mass, 8,000 and 15 molecules with each of mass 80,000 is

A. 22000

B. 33000

C. 11000

D. 44000

Answer: D



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112. Which of the following statements are correct ?

(A) A tripeptide had two peptide bonds.

(B) A penapeptide contains five amino acids.

(C) Nucleotide is a product of base and sugar

(D) In cellulose, β -glycosidic linkages are present.

A. B, C, D

B. C, D only

C. A, B, D

D. A, C only

Answer: C



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113. Identify antihistamines from the following :

Serotonin Dimetane Phenelzine Seldane

1

2

3

4

A. 1, 3 only

B. 1, 3,4

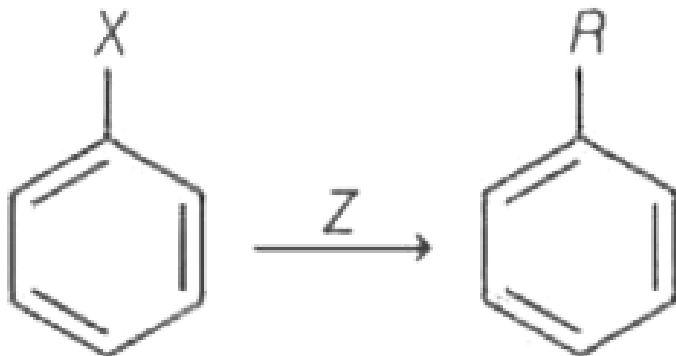
C. 2, 4, only

D. 1, 2, 3

Answer: C

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114. Identify \bar{Z} in the reaction :



A. RCOX / Anhydrous $AlCl_3$

B. RX/Na/dry $(C_2H_5)_2O$

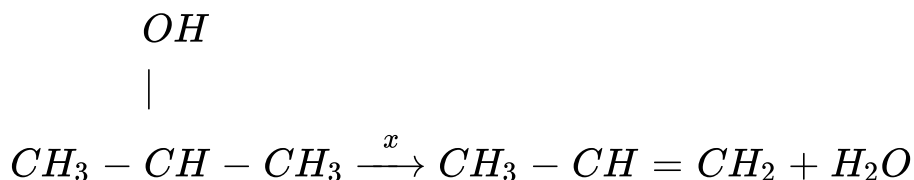
C. Na/dry $(C_2H_5)_2O$

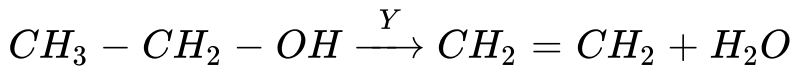
D. RCOX/ $FeCl_3$

Answer: B

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115. What are X, Y, Z in the following reactions ?





|



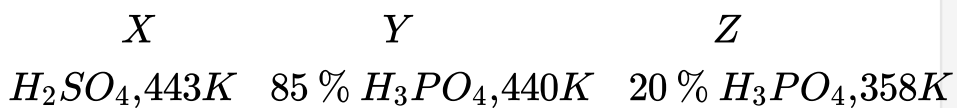
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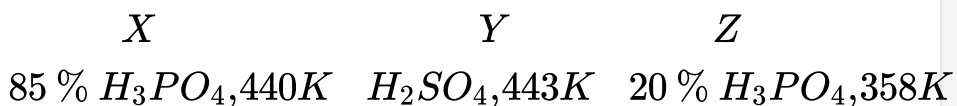
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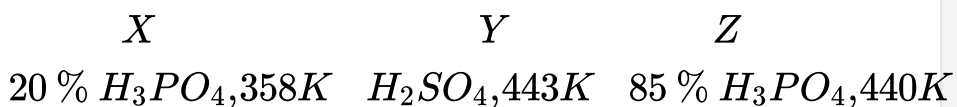
A.



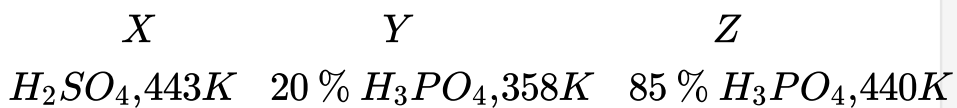
B.



C.



D.

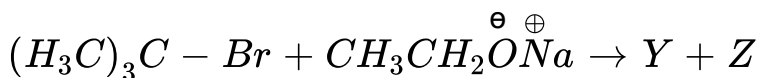
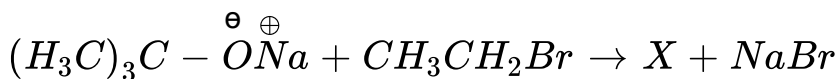


Answer: B



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116. What are X,Y and Z in the following reactions ?

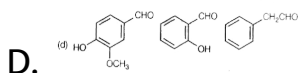
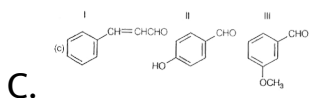
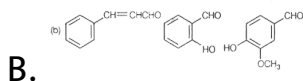
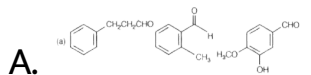


X	Y	Z
(a) $(H_3C)_3C - Br$	$(H_3C)_3C - OH$	CH_3CH_2Br
(b) $CH_3 - \underset{\substack{ \\ CH_3}}{C} = CH_2$	$(H_3C)_3C - OCH_2CH_3$	NaBr
(c) $(H_3C)_3C - OCH_2CH_3$	$CH_3 - \underset{\substack{ \\ CH_3}}{C} = CH_2$	CH_3CH_2OH
(d) $CH_3 - \underset{\substack{ \\ CH_3}}{C}H - CH_2OH$	$CH_3 - \underset{\substack{ \\ CH_3}}{C}H - OCH_2CH_3$	NaBr



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117. Structure of cinnamaldehyde (I), salicylaldehyde (II) and vanillin (III) are



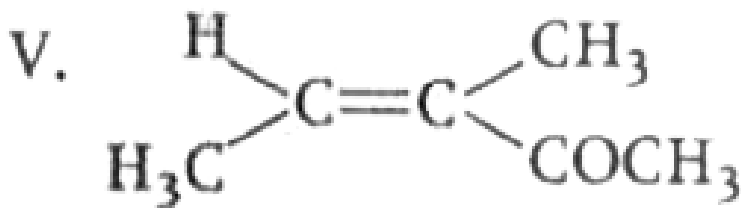
Answer: B

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118. Which of the following are oxidised by NaOCl ?



III. $R - COCH_3$ IV. CH_3CHO



A. I, III, IV, V

B. I, II, III

C. II, IV, V

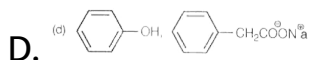
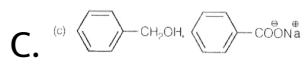
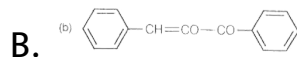
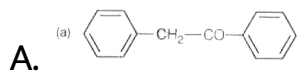
D. II, III, IV

Answer: A



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119. Benzaldehyde on heating with concentrated NaOH gives



Answer: C

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120. The reaction



is known as

A. Swarts reaction

B. Gatterman reaction

C. Sandmeyer reaction

D. Stephen reaction

Answer: B



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