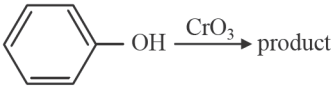
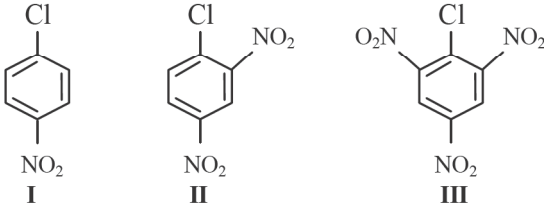


MHT-CET 2024 Question Paper - Chemistry

4th May 2024 (Shift – I)

- Calculate wave length for emission of a photon having wave number 11516 cm^{-1} .
(A) 216 nm (B) 434 nm
(C) 868 nm (D) 642 nm
- Half life of a first order reaction is 1 hour. What fraction of it will remain after 3 hour?
(A) $\frac{1}{8}$ (B) $\frac{1}{9}$ (C) $\frac{1}{16}$ (D) $\frac{1}{64}$
- Identify the product of following reaction.

 (A) Benzene (B) Benzoic acid
 (C) Benzaldehyde (D) p-Benzoquinone
- Calculate vapour pressure of a solution containing mixture of 2 moles of volatile liquid A and 3 moles of volatile liquid B at room temperature.
 $(P_A^\circ = 420, P_B^\circ = 610\text{ mm Hg})$
 (A) 600 mm Hg (B) 570 mm Hg
 (C) 534 mm Hg (D) 480 mm Hg
- Which from following statements about neoprene is false?
 (A) It is a copolymer and polymerization occurs in presence of MgO.
 (B) It is a synthetic rubber.
 (C) It is used to prepare hose pipes for transport of gasoline.
 (D) The monomer involved in it's preparation is unsaturated.
- Identify neutral sphere complex from following.
 (A) Pentaamminecobalt(III) sulphate
 (B) Potassiumtrioxalatoaluminate(III)
 (C) Diamminedichloroplatinum(II)
 (D) Potassiumhexacyanoferrate(III)
- Which from following statements is CORRECT about saccharic acid?
 (A) It contains two carboxyl and four hydroxyl groups
 (B) It contains one carboxyl group and five hydroxyl groups
 (C) It contains two carboxyl groups and five hydroxyl groups
 (D) It contains three carboxyl and two hydroxyl groups
- Identify ferromagnetic substance from following.
 (A) NaCl (B) C_6H_6
 (C) CrO_2 (D) H_2O
- Which from following compounds is used to prepare adipic acid using enzymes in green technology developed by Drath and Frost?
 (A) Ribose (B) Glucose
 (C) Ribulose (D) Benzene
- Which from following pairs of compounds exhibits metamerism?
 (A) But-2-ene and but-1-ene
 (B) Methoxymethane and Ethanol
 (C) Ethoxyethane and Methoxypropane
 (D) Butane and 2-Methylpropane
- Identify a mineral of zinc from following.
 (A) Siderite (B) Calamine
 (C) Chalcocite (D) Limonite
- Identify the element having lowest first ionization enthalpy
 (A) Po (B) Te
 (C) Br (D) Kr
- Calculate molar mass of an element having density 8.6 g cm^{-3} if it forms bcc structure [$a^3 \times N_A = 22.0\text{ cm}^3\text{ mol}^{-1}$]
 (A) 106.18 g mol^{-1} (B) 94.6 g mol^{-1}
 (C) 88.25 g mol^{-1} (D) 80.16 g mol^{-1}
- Which from following mixtures in water acts as a basic buffer?
 (A) $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$
 (B) $\text{C}_6\text{H}_5\text{COOH} + \text{C}_6\text{H}_5\text{COONa}$
 (C) $\text{HCOOH} + \text{H COOK}$
 (D) $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$
- Which from following molecules does not have lone pair of electrons in valence shell of central atom?
 (A) NH_3 (B) H_2O
 (C) SO_2 (D) BF_3
- Calculate the molar mass of non volatile solute when 1 g of it is dissolved in 100 g solvent decreases its freezing point by 0.2 K.
 $[\text{K}_f = 1.2\text{ K kg mol}^{-1}]$
 (A) 55 g mol^{-1} (B) 60 g mol^{-1}
 (C) 65 g mol^{-1} (D) 70 g mol^{-1}



17. Which from following statements is NOT true about lyophilic colloids?
(A) The particles of dispersed phase have greater affinity for the dispersion medium.
(B) These are reversible.
(C) These are self stabilized.
(D) Coagulation occurs even by adding very small amount of electrolytes.
18. Calculate the pH of a buffer solution containing 0.35 M weak acid and 0.70 M of its salt with strong base if pK_a is 4.56.
(A) 6.11 (B) 3.72
(C) 4.86 (D) 5.65
19. Which of the following alkenes does NOT exhibit Cis-trans isomerism?
(A) But-1-ene
(B) But-2-ene
(C) 3,4-Dimethylhex-3-ene
(D) Pent-2-ene
20. Which of the following reactions occurs at cathode during discharging of lead accumulator?
(A) $PbSO_{4(s)} + 2e^- \longrightarrow Pb_{(s)} + SO_4^{2-}{}_{(aq.)}$
(B) $Pb_{(s)} + SO_4^{2-}{}_{(aq.)} \longrightarrow PbSO_{4(s)} + 2e^-$
(C) $PbO_{2(s)} + 4H^+{}_{(aq.)} + SO_4^{2-}{}_{(aq.)} + 2e^- \longrightarrow PbSO_{4(s)} + 2H_2O_{(l)}$
(D) $PbSO_{4(s)} + 2H_2O_{(l)} \longrightarrow PbO_{2(s)} + 4H^+{}_{(aq.)} + SO_4^{2-}{}_{(aq.)} + 2e^-$
21. Identify the product obtained when ethers are dissolved in cold concentrated sulphuric acid.
(A) Alkanols
(B) Alkanoic acids
(C) Alkyl hydrogen sulphate
(D) Oxonium salts
22. Identify the chiral molecule from following.
(A) 2-Iodopropane
(B) 2-Iodo-2-methylbutane
(C) 2-Iodo-3-methylbutane
(D) 3-Iodopentane
23. Which compound from following contains iodine with highest oxidation number?
(A) KIO_3 (B) KI
(C) IF_5 (D) KIO_4
24. How many isomers of $C_4H_{11}N$ are secondary amines?
(A) One (B) Two
(C) Three (D) Four
25. The correct order of reactivity for reactions involving cleavage of C–Cl bond in following compounds is

(A) I > II > III (B) II > III > I
(C) III > I > II (D) III > II > I
26. Which of the following is Stephen reaction?
(A) $R-COCl \xrightarrow[Pd-BaSO_4]{H_2} R-CHO + HCl$
(B) $R-CN \xrightarrow[i) H_3O^+]{i) SnCl_2, HCl} R-CHO + NH_4Cl$
(C) $R-CHO \xrightarrow[\Delta]{Zn \cdot Hg \text{ conc. } HCl} R-CH_3 + H_2O$
(D) $R-CHO \xrightarrow[i) KOH, HO-CH_2-CH_2-OH]{i) H_2N-NH_2} R-CH_2-R$
27. How many isotopes of nitrogen are found?
(A) 2 (B) 3 (C) 4 (D) 6
28. Which of the following colours is developed when alkali metal is dissolved in liquid ammonia?
(A) dark red (B) violet
(C) deep blue (D) green
29. What is IUPAC name of Acrylic acid?
(A) Propanoic acid
(B) Prop-2-enoic acid
(C) 2-Methylpropanoic acid
(D) 2-Hydroxypropanoic acid
30. Which of the following statements is correct regarding isobars?
(A) These have same number of neutrons.
(B) These are the atoms of different elements.
(C) These have same atomic number.
(D) These have different mass number.
31. Calculate the volume of gas at 1.25 atmosphere, if volume occupied by gas at 1 atmosphere and at same temperature is 25 mL.
(A) 15 mL (B) 20 mL
(C) 25 mL (D) 35 mL
32. In the Arrhenius plot of $\log k$ versus $1/T$ find the value of intercept on y axis
(A) $\log_{10} A$ (B) $\frac{-E_a}{R}$
(C) $\ln k$ (D) R/E_a
33. Which of the following compounds when treated with ammoniacal silver nitrate exhibits silver mirror test?
(A) Ethanol (B) Ethanal
(C) Ethoxy ethane (D) Ethanoic acid



34. Which from following polymers is NOT obtained by addition polymerisation method?
(A) $\text{---CH}_2\text{---CH}_2\text{---}$
(B) $\text{---CH}_2\text{---}\underset{\text{CN}}{\text{CH}}\text{---}$
(C) $\text{---NH---}(\text{CH}_2)_5\overset{\text{O}}{\underset{\text{||}}{\text{C}}}\text{---}$
(D) $\text{---CH}_2\text{---}\underset{\text{Cl}}{\text{CH}}\text{---}$
35. Which of the following symbols represent heat of reaction at constant volume ?
(A) ΔH (B) dq
(C) ΔS (D) ΔU
36. For the reaction,
 $3\text{I}^-_{(\text{aq.})} + \text{S}_2\text{O}_8^{2-}_{(\text{aq.})} \longrightarrow 2\text{SO}_4^{2-}_{(\text{aq.})} + \text{I}_3^-_{(\text{aq.})}$
rate of formation of $\text{SO}_4^{2-}_{(\text{aq.})}$ is $0.044 \text{ mol dm}^{-3} \text{ s}^{-1}$.
Calculate rate of consumption of $\text{I}^-_{(\text{aq.})}$.
(A) $0.022 \text{ mol dm}^{-3} \text{ s}^{-1}$
(B) $0.044 \text{ mol dm}^{-3} \text{ s}^{-1}$
(C) $0.066 \text{ mol dm}^{-3} \text{ s}^{-1}$
(D) $0.088 \text{ mol dm}^{-3} \text{ s}^{-1}$
37. Identify a ligand having two donor atoms but uses a pair of electrons of either donor atom to form coordinate bond.
(A) Aqua
(B) Ethylenediamine
(C) Sulphato
(D) Nitrito
38. Which of the following solutions on complete dissociation exhibits maximum elevation in boiling point?
(A) 0.1 m KCl (B) 0.05 m NaCl
(C) 0.1 m BaCl_2 (D) 0.1 m MgSO_4
39. Calculate the entropy change for melting 1 g ice at 0°C in $\text{J g}^{-1} \text{K}^{-1}$ if heat of fusion of ice at 0°C is 80 J K^{-1} .
(A) 0.039 (B) 0.293
(C) 8.0 (D) 27.3
40. Which pair of elements from following has half filled d-orbital in observed electronic configuration ?
(A) Cu and Mn (B) Mn and Cr
(C) Zn and Co (D) Cu and Zn
41. Calculate the radius of metal atom if it forms bcc unit cell having edge length 530 pm .
(A) 229.5 pm (B) 187.4 pm
(C) 459.0 pm (D) 265.2 pm
42. Calculate the concentration of weak monobasic acid if its degree of dissociation and dissociation constant are 5.0×10^{-4} and 5.0×10^{-9} respectively.
(A) 0.1 M (B) 0.02 M
(C) 0.03 M (D) 0.04 M
43. Which of the following is a secondary allylic alcohol?
(A) $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{OH}$
(B) $\text{CH}_2 = \text{CH} - \underset{\text{CH}_3}{\text{CH}} - \text{OH}$
(C) $\text{CH}_3 - \text{CH} = \text{CH} - \text{CH}_2 - \text{OH}$
(D) $\text{CH}_2 = \text{CH} - \text{C}(\text{CH}_3)_2 - \text{OH}$
44. Which of the following set of properties is correct when one mole of a gas is heated keeping volume constant by increasing temperature and supplying 500 J of heat?
(A) $q = w = 500 \text{ J}$, $\Delta U = 0$
(B) $q = \Delta U = 500 \text{ J}$, $w = 0$
(C) $q = \Delta U = -500 \text{ J}$, $w = 0$
(D) $q = 500 \text{ J}$, $\Delta U = w = 0$
45. The conductivity of 0.005 M NaI solution at 25°C is $6.07 \times 10^{-4} \Omega^{-1} \text{ cm}^{-1}$. Calculate its molar conductivity
(A) $121.4 \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
(B) $110.1 \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
(C) $201.1 \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
(D) $241.4 \Omega^{-1} \text{ cm}^2 \text{ mol}^{-1}$
46. Which of the following is correct decreasing order of boiling point of compounds?
(A) $\text{CH}_3\text{Cl} > \text{CH}_3\text{Br} > \text{CH}_2\text{Br}_2 > \text{CHBr}_3$
(B) $\text{CH}_3\text{Br} > \text{CH}_2\text{Br}_2 > \text{CHBr}_3 > \text{CH}_3\text{Cl}$
(C) $\text{CHBr}_3 > \text{CH}_2\text{Br}_2 > \text{CH}_3\text{Br} > \text{CH}_3\text{Cl}$
(D) $\text{CH}_3\text{Br} > \text{CH}_3\text{Cl} > \text{CHBr}_3 > \text{CH}_2\text{Br}_2$
47. What is the value of electronegativity of oxygen?
(A) 4.0 (B) 3.5 (C) 2.48 (D) 3.2
48. What is IUPAC name of Ethylmethylisopropylamine?
(A) N-Methyl-N-isopropylethanamine
(B) N-Ethyl-N-methyl propan-1-amine
(C) N-Ethyl-N-methylpropan-2-amine
(D) N-Ethyl-N-isopropylmethanamine
49. Calculate the amount of electricity required in coulombs to convert 0.08 mol of MnO_4^- to Mn^{2+}
(A) 96500 C (B) 38600 C
(C) 48250 C (D) 19300 C
50. Which of the following one letter symbol is used to represent aspartic acid?
(A) D (B) R (C) A (D) S