



## General Certificate of Education (Adv. Level) Examination- 2026

3<sup>rd</sup> Term Test - 2026

Chemistry I

Grade 13

Time : 2 hours

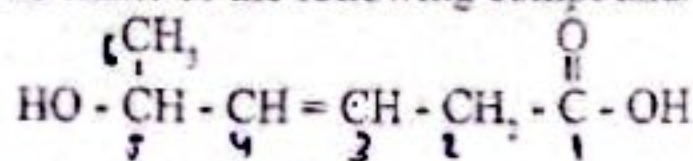
Universal gas constant  $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$  Avogadro constant  $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$ Plank Constant  $= 6.626 \times 10^{-34} \text{ J s}$  speed of light  $C = 3.0 \times 10^8 \text{ m s}^{-1}$ Faraday Constant  $= 96500 \text{ C mol}^{-1}$ 

01. Correct statement regarding Earnest Rutherford and Ronald Gilespy respectively is,
- (1) Investigating nuclear model and releasing three types of rays  $\alpha$ ,  $\beta$ ,  $\gamma$  during radioactivity
  - (2) Investigating nucleus of an atom and introducing VSPER theory to decide shape of ions or molecules.
  - (3) Investigating gold foil experiment and metallic bonding model.
  - (4) Photo-electric effect and dual behavior of electrons as particle and wave.
  - (5) Investigating atomic nucleus and Radioactivity.
02. Number of atomic orbitals having quantum number  $n = 3$  and  $m_l = 0$  is,
- (1) 3
  - (2) 5
  - (3) 6
  - (4) 18
  - (5) 32
03. Correct ascending order of electronegativity of N in  $\text{NH}_4^+$ ,  $\text{N}_2\text{H}_4$ ,  $\text{NH}_3$ ,  $\text{CH}_3\text{NH}_2$  is,
- (1)  $\text{N}_2\text{H}_4 < \text{NH}_3 < \text{NH}_4^+ < \text{CH}_3\text{NH}_2$
  - (2)  $\text{N}_2\text{H}_4 < \text{NH}_3 < \text{CH}_3\text{NH}_2 < \text{NH}_4^+$
  - (3)  $\text{CH}_3\text{NH}_2 < \text{NH}_4^+ < \text{NH}_3 < \text{N}_2\text{H}_4$
  - (4)  $\text{NH}_3 < \text{CH}_3\text{NH}_2 < \text{N}_2\text{H}_4 < \text{NH}_4^+$
  - (5)  $\text{NH}_4^+ < \text{NH}_3 < \text{CH}_3\text{NH}_2 < \text{N}_2\text{H}_4$
04. Correct answer that shows major secondary interactions available in orthonitrophenol, aqueous  $\text{I}_2$ ,  $\text{CCl}_4(l)$ ,  $\text{KI(aq)}$  in  $\text{I}_2$  respectively is,
- (1) Intermolecular hydrogen bonds, dipole – induced dipole interactions ion- induced dipole interaction, London- dispersion forces
  - (2) Intermolecular hydrogen bonds, Hydrogen bonds, London – dispersion forces, ion – induced dipole interactions.
  - (3) Intermolecular hydrogen bonds, Hydrogen bonds, dipole induced dipole interactions, London dispersion forces.
  - (4) Intramolecular hydrogen bonds, Hydrogen bonds, London – dispersion forces, ion – induced dipole interactions.
  - (5) Intra molecular hydrogen bonds, Hydrogen bonds, dipole – dipole interactions, ion induced dipole interactions,

05. Select correct statement

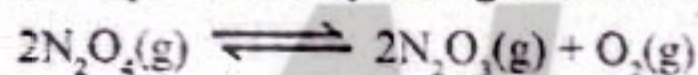
- (1) Melting point of Mg, K, Na, Ca increase as  $\text{Na} < \text{K} < \text{Mg} < \text{Ca}$ .
- (2) Bond length of central atom and terminal atom in  $\text{NO}_3^-$ ,  $\text{NO}_2^+$ ,  $\text{H}_2\text{S}$  and  $\text{H}_2\text{O}$  increases as  $\text{NO}_3^- < \text{NO}_2^+ < \text{H}_2\text{O} < \text{H}_2\text{S}$
- (3) Electronegativity of B, S, Cl, I increase as  $\text{B} < \text{S} < \text{I} < \text{Cl}$  according to the Pauling's scale
- (4) Polarizing power of  $\text{K}^+$ ,  $\text{Rb}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Sr}^{2+}$  increasing as  $\text{Ca}^{2+} < \text{Sr}^{2+} < \text{K}^+ < \text{Rb}^+$
- (5) Boiling point of  $\text{H}_2\text{O}_2$ ,  $\text{H}_2\text{O}$ ,  $\text{NH}_3$ ,  $\text{HF}$  increases as  $\text{NH}_3 < \text{HF} < \text{H}_2\text{O} < \text{H}_2\text{O}_2$

06. Write IUPAC name of the following compound.



- (1) 5-hydroxy-5-methyl-3-pentenoic acid
- (2) 1-methyl-5-oxo-2-penten-1-ol
- (3) 5-methyl-5-hydroxy-3-pentenoic acid
- (4) 5-hydroxy-3-hexenoic acid
- (5) 2-hydroxy-3-hexenoic acid

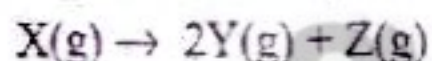
07. Consider equilibrium system given below at definite temperature Only  $\text{N}_2\text{O}_4(\text{g})$  gas in the initial system.



Equilibrium partial pressure of  $\text{O}_2(\text{g})$  is  $P_{\text{O}_2}$  and total equilibrium pressure is  $P_T$ . Correct  $K_p$  expression is,

- (1)  $\frac{4P_{\text{O}_2}^3}{P_T^2 - 9P_{\text{O}_2}^2}$
- (2)  $\frac{2P_{\text{O}_2}^2}{P_T^2 - 3P_{\text{O}_2}^2}$
- (3)  $\frac{P_{\text{O}_2}^3}{P_T - 3P_{\text{O}_2}^2}$
- (4)  $\frac{P_{\text{O}_2}^3}{P_T^2 - 9P_{\text{O}_2}^2}$
- (5)  $\frac{2P_{\text{O}_2}^2}{P_T^2 - 2P_{\text{O}_2}^2}$

08. 0.5 g of solid compound X get decomposed completely in  $24.942 \text{ dm}^3$  container at  $327^\circ\text{C}$



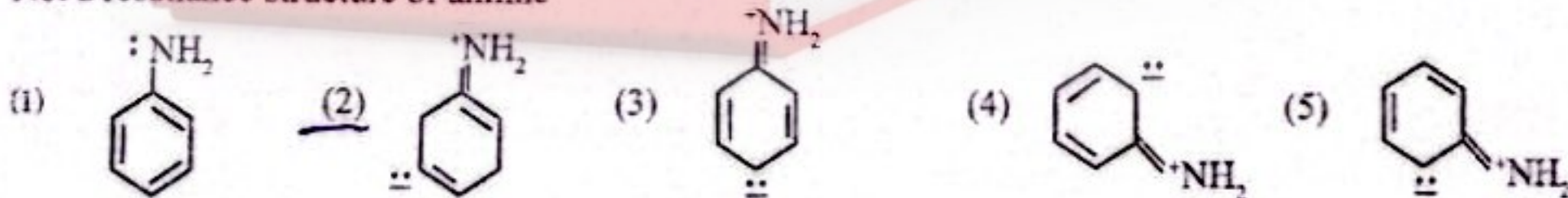
Pressure of the container after decomposition is  $5 \times 10^3 \text{ Pa}$ . Molar mass of X is,

- (1) 6
- (2) 12
- (3) 20
- (4) 30
- (5) 60

09. Correct answer that shows standard enthalpy gain of 1<sup>st</sup> electron of Iodine and standard enthalpy change of sublimation of  $\text{I}_2$  respectively

- (1)  $\text{I}(\text{g}) + e \rightarrow \text{I}^-(\text{g})$  and  $\text{I}_2(\text{s}) \rightarrow \text{I}_2(\text{g})$
- (2)  $\text{I}_2(\text{g}) + 2e \rightarrow 2\text{I}^-(\text{g})$  and  $1/2\text{I}_2(\text{s}) \rightarrow \text{I}(\text{g})$
- (3)  $\text{I}(\text{g}) \rightarrow \text{I}^+ + e$  and  $\text{I}_2(\text{s}) \rightarrow \text{I}_2(\text{g})$
- (4)  $\text{I}(\text{s}) + e \rightarrow \text{I}^-(\text{g})$  and  $\text{I}_2(\text{s}) \rightarrow 2\text{I}(\text{g})$
- (5)  $\text{I}_2(\text{g}) + 2e \rightarrow 2\text{I}^-(\text{g})$  and  $\text{I}(\text{s}) \rightarrow \text{I}(\text{g})$

10. Not a resonance structure of aniline



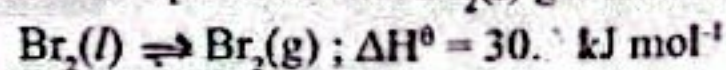
11. 1.55 g of weight lost during 5 g of  $\text{NaHCO}_3$  sample is heated at  $130^\circ\text{C}$ . Mass percentage of undissociated  $\text{NaHCO}_3$  is ( $\text{Na}=23$ ,  $\text{H}=1$ ,  $\text{C}=12$ ,  $\text{O}=16$ )

- (1) 16%
- (2) 32%
- (3) 69%
- (4) 66%
- (5) 84%

12. Select the compound, that undergoes single step nucleophilic substitution reaction easily

- (1)  $\text{C}_6\text{H}_5\text{Br}$
- (2)  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$
- (3)  $(\text{CH}_3)_3\text{C-Br}$
- (4)  $\text{CH}_2=\text{CHBr}$
- (5)  $(\text{CH}_3)_2\text{CHBr}$

13. Calculate temperature that  $\text{Br}_2(l)$  get freeze<sup>d</sup> using given data.



$$S^\circ \text{Br}_2(l) = 152 \text{ kJ mol}^{-1}$$

$$S^\circ \text{Br}_2(g) = 245 \text{ kJ mol}^{-1}$$

- (1)  $151^\circ\text{C}$  (2)  $49.5^\circ\text{C}$  (3)  $-49.5^\circ\text{C}$  (4)  $122^\circ\text{C}$  (5)  $-122^\circ\text{C}$

14. Saturated vapour pressures of diethyl ether and ethanol are  $P_D^\circ$  and  $P_E^\circ$  respectively. Mole fractions of diethyl ether and ethanol respectively in binary mixture are  $X_D$  and  $X_E$ . Mole fraction of ethanol in vapour phase is,

- (1)  $\frac{P_E^\circ X_E}{X_D X_E}$  (2)  $\frac{P_E^\circ X_E}{P_D^\circ + P_E^\circ}$  (3)  $\frac{P_E^\circ X_E}{X_D P_D^\circ + X_E P_E^\circ}$  (4)  $\frac{P_E^\circ}{X_E + X_D}$  (5)  $X_E(P_D^\circ - P_E^\circ)$

15. Select reagent that does not need to make  $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_2\text{CH}_3}{\overset{\text{OH}}{\text{C}}} - \text{CH}_3$  by using  $\text{CH}_3\text{COOH}$  as one and only starting organic compound

- (1)  $\text{PCl}_5$  ✓ (2)  $\text{LiAlH}_4$  ✓ (3)  $\text{PCC}$  (4)  $\text{dil. H}_2\text{SO}_4$  (5)  $\text{Mg/CH}_3\text{OCH}_3$  ✓

16. Correct answer that gives acidic, basic, amphoteric and neutral oxides respectively is,

- (1)  $\text{Mn}_2\text{O}_7, \text{MgO}, \text{Cr}_2\text{O}_3, \text{N}_2\text{O}$  (2)  $\text{CO}_2, \text{CaO}, \text{N}_2\text{O}, \text{CO}$   
 (3)  $\text{CrO}_3, \text{SrO}, \text{Al}_2\text{O}_3, \text{N}_2\text{O}_5$  (4)  $\text{N}_2\text{O}_5, \text{P}_4\text{O}_{10}, \text{Al}_2\text{O}_3, \text{CO}$   
 (5)  $\text{BeO}, \text{P}_2\text{O}_5, \text{PbO}, \text{NO}$  ✗

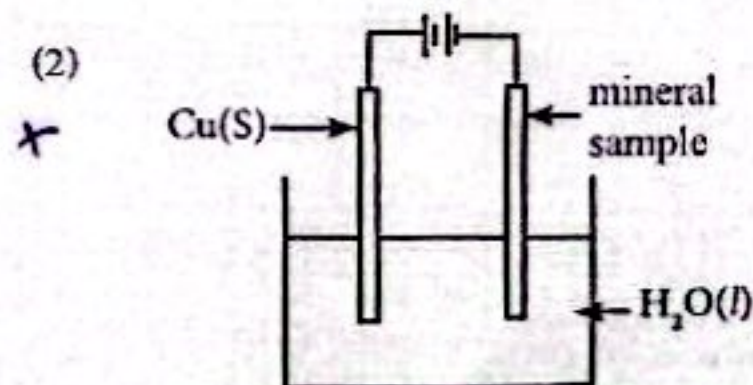
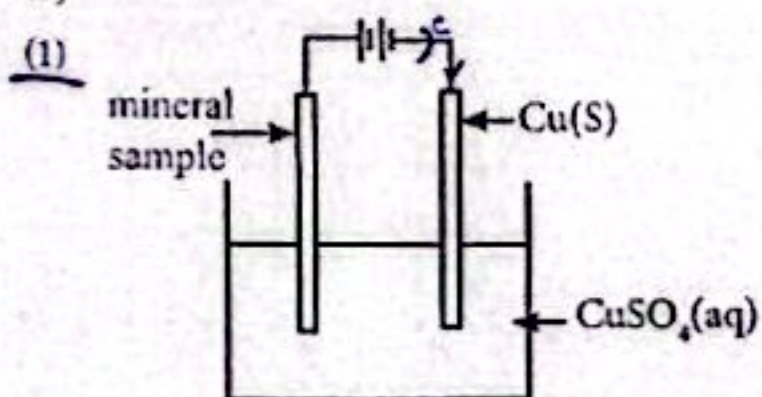
17.  $100 \text{ cm}^3$  water and  $10 \text{ cm}^3$  of  $\text{CCl}_4$  Solutions are contacted each other in closed container. Solute  $\text{I}_2$  distributed both these solutions and finally achieved equilibrium.  $20 \text{ cm}^3$  of aqueous layer and  $5 \text{ cm}^3$  of  $\text{CCl}_4$  layer aliquotes (samples) used for titration with  $\text{Na}_2\text{S}_2\text{O}_3$  solution.  $V_1 \text{ cm}^3$  and  $V_2 \text{ cm}^3$  needed for each respectively. Calculate partition co-efficient in between  $\text{CCl}_4$  and  $\text{H}_2\text{O}$  layers.

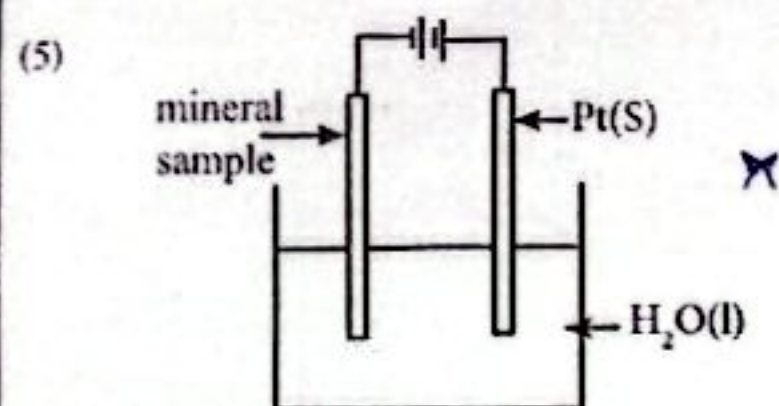
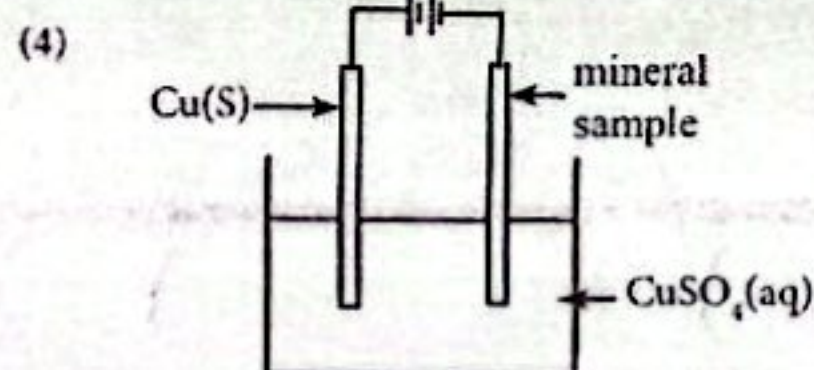
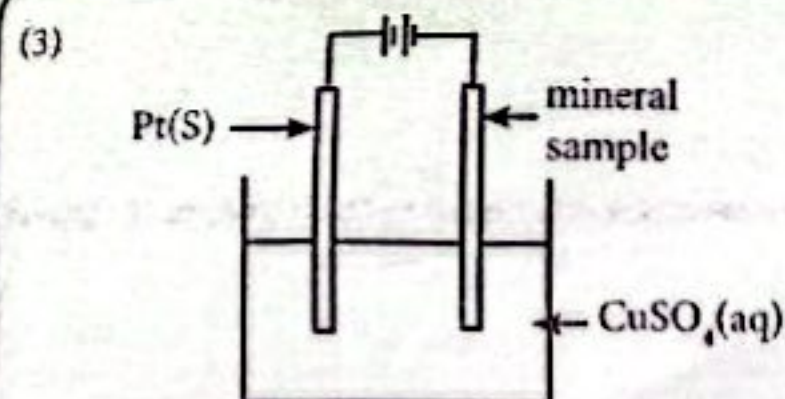
- (1)  $\frac{5V_2}{V_1}$  (2)  $\frac{5V_1}{V_2}$  (3)  $\frac{V_2}{V_1}$  (4)  $\frac{4V_2}{V_1}$  (5)  $\frac{V_3}{10V_1}$

18. Correct statement is,

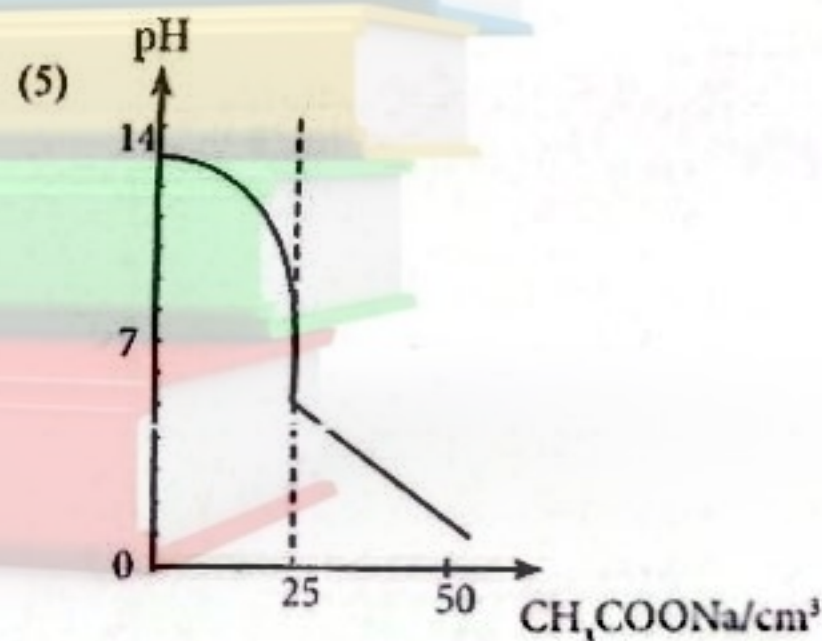
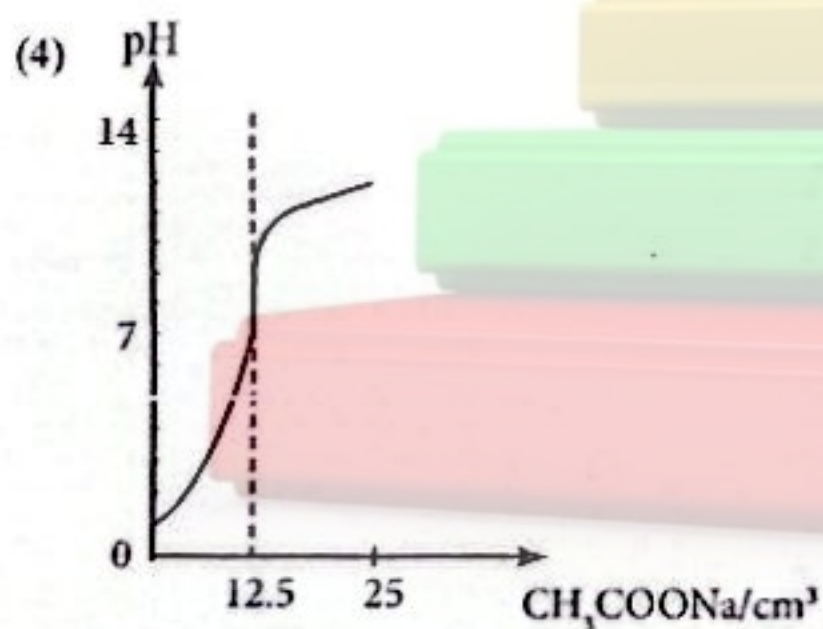
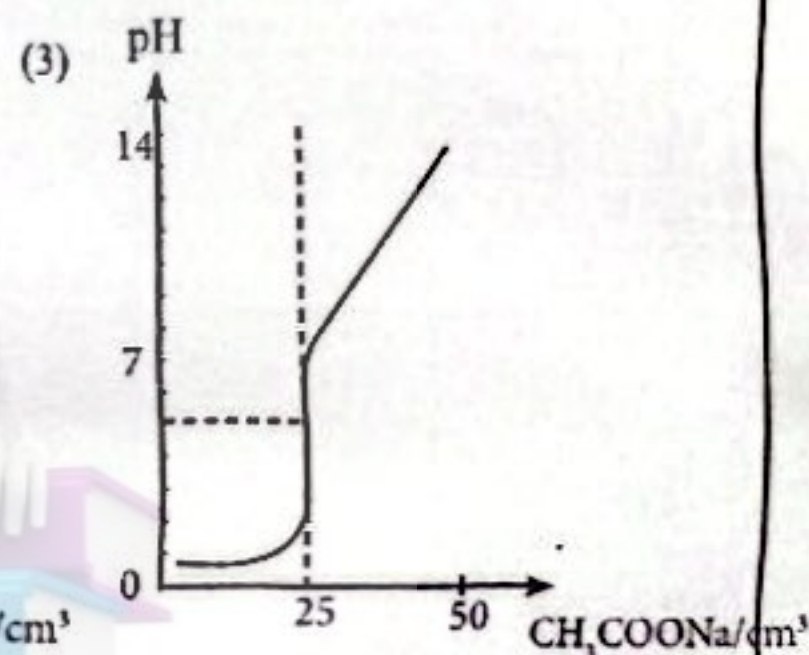
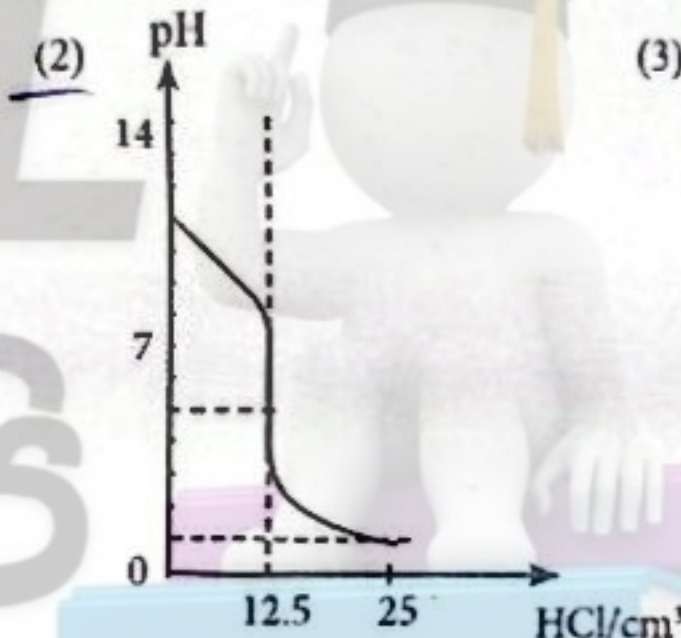
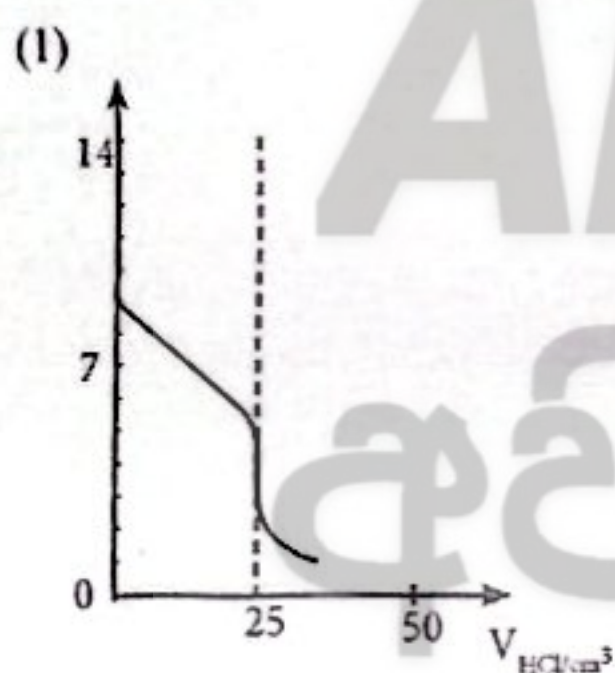
- (1) Two organic compounds given as products when aliphatic alkyl halides get reacted with alkoxide ( $\text{RO}^-$ ) ✗  
 (2) Reaction of benzene diazonium chloride with phenol in the medium of alkaline is an electrophilic addition.  
 (3) Phenol undergoes nucleophilic substitution reaction easily due to stability of phenyl carbocation. ✗  
 (4) Acetone gives carboxylic acids when reacts with  $\text{HCN}$ . ✗  
 (5) 2,4-DNP can be used to identify aldehydes from ketones. ✗

19. Correct experimental setup that can be used to extract pure copper using impure copper in the laboratory is,





20. Select correct pH curve used to represent titration of  $25\text{cm}^3$  of  $0.1\text{ mol dm}^{-3}$   $\text{CH}_3\text{COONa}$  with  $0.1\text{ mol dm}^{-3}$   $\text{HCl}$  solution. ( $K_a$  of  $\text{CH}_3\text{COOH(aq)} = 1 \times 10^{-5}\text{ mol dm}^{-3}$ )



21. An aqueous solution is saturated with both  $\text{SrCO}_3(\text{aq})$  and  $\text{CaCO}_3$ . It has  $3.5 \times 10^{-6}\text{ mol dm}^{-3}$   $[\text{Sr}^{2+}(\text{aq})]$ , Calculate  $[\text{Ca}^{2+}(\text{aq})]$

( $K_{sp}(\text{SrCO}_3) = 7 \times 10^{-10}\text{ mol}^2\text{dm}^{-6}$ ,  $K_{sp}(\text{CaCO}_3) = 4.8 \times 10^{-9}\text{ mol}^2\text{dm}^{-6}$ )

(1)  $2.4 \times 10^{-5}\text{ mol dm}^{-3}$

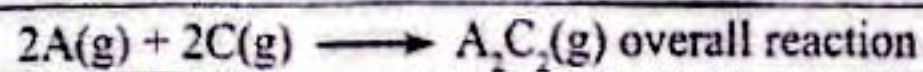
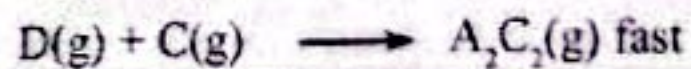
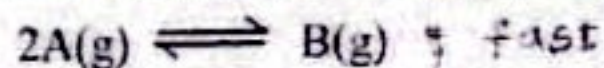
(2)  $2.6 \times 10^{-6}\text{ mol dm}^{-3}$

(3)  $5.2 \times 10^{-5}\text{ mol dm}^{-3}$

(4)  $5.8 \times 10^{-6}\text{ mol dm}^{-3}$

(5)  $3 \times 10^{-6}\text{ mol dm}^{-3}$

22. Consider multistep reaction given below (A, B, C, D are not true symbols)



Rate of reaction R for overall reaction is,

(1)  $R \propto \frac{[C(g)]^2}{[A(g)]^2}$

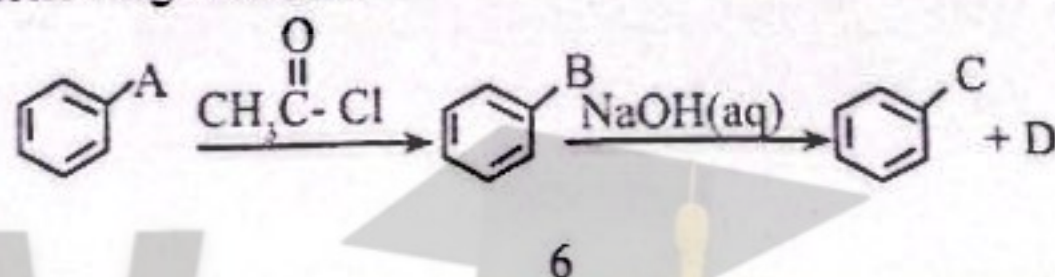
(2)  $R \propto [C(g)]^2 [A(g)]^2$

(3)  $R \propto [C(g)] [A(g)]^2$

(4)  $[C(g)] [A(g)]$

(5)  $R \propto \frac{[A_2C_2(g)]}{[A(g)]^2 [C(g)]^2}$

23. Identify A, B, C, D in following reaction.



|          | A                       | B                                                                                         | C                                  | D                                                                                                  |
|----------|-------------------------|-------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------|
| 1        | -OH                     | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OH} \end{array}$               | $\text{O}^-\text{Na}^+$            | HCOOH                                                                                              |
| <u>2</u> | -OH                     | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{O}-\text{C}-\text{CH}_3 \end{array}$    | $\text{O}^-\text{Na}^+$            | $\text{CH}_3-\begin{array}{c} \text{O} \\ \parallel \\ \text{C}-\text{O}^-\text{Na}^+ \end{array}$ |
| 3        | $-\text{NH}_2$          | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{NH}-\text{C}-\text{CH}_3 \end{array}$   | $-\text{COO}^-\text{Na}^+$         | $\text{H}_2\text{O}$                                                                               |
| 4        | $-\text{NH}_2$          | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{NH}_2 \end{array}$             | $-\text{COOH}$                     | $\text{NH}_3$                                                                                      |
| 5        | $-\text{CH}_2\text{OH}$ | $\begin{array}{c} \text{O} \\ \parallel \\ -\text{CH}_2-\text{C}-\text{CH}_3 \end{array}$ | $-\text{CH}_2\text{CH}_2\text{OH}$ | $\text{CH}_3\text{OH}$                                                                             |

24. Correct statement is,

- (1) When entropy increases in any system, reaction becomes spontaneous ✗
- (2) Standard entropy change of C(s, diamond) is non zero value however ((s, graphite) is zero ✗
- (3) When an exothermic reaction occurs in a closed system entropy of surrounding is  $\Delta S < 0$
- (4) No entropy change when ice becomes liquid water at  $0^\circ\text{C}$ .
- (5) When  $\Delta S > 0$  in any exothermic reaction then any condition it is spontaneous.

25. 0.3 mol of  $\text{NH}_3$  solution is mixed with 0.5 mol of  $\text{NH}_4\text{Cl}$  solution in  $1 \text{ dm}^3$  solution. 0.1 mol of  $\text{HCl(aq)}$  added to this solution. Final pH value of this system is, (No volume change during mixing) ( $pK_a(\text{NH}_4^+) = 9.4$ )

- (1) 8.77      (2) 9.04      (3) 9.32      (4) 5.26      (5) 5.87

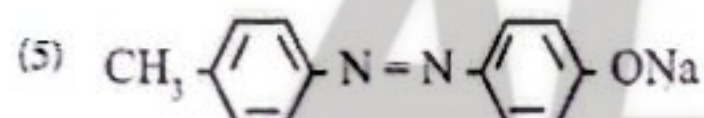
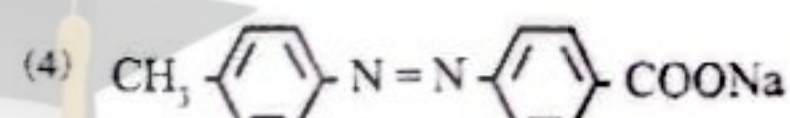
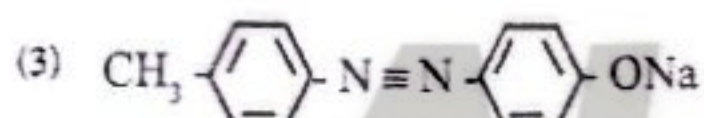
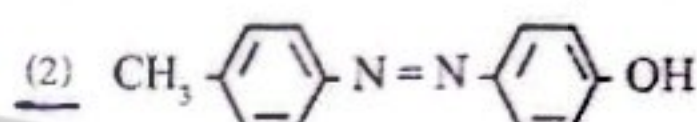
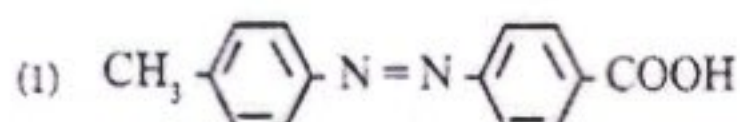
26. A cell is made up by using Ag rod which is dipped in  $\text{AgNO}_3$  solution and Cu rod which is dipped in  $\text{CuSO}_4$  solution and both half cells joined by salt bridge with  $\text{KCl(aq)}$ .

Select incorrect statement regarding this cell  $[E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}, E^\circ_{\text{Ag}^+/\text{Ag}} = +0.80\text{V}]$

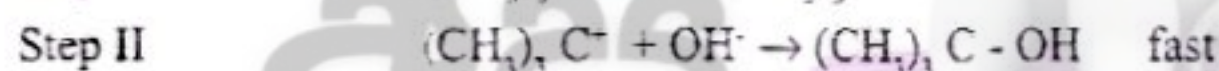
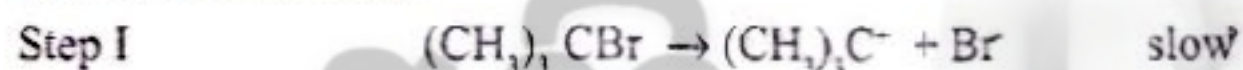
(1) It is a Galvanic cell and has cell notation  $\text{Cu(s)} | \text{Cu}^{2+}(\text{aq}, 1\text{mol dm}^{-3}) || \text{Ag}^+(\text{aq}, 1\text{mol dm}^{-3}) / \text{Ag(s)}$

- (2) Cell reaction is  $\text{Cu(s)} + 2\text{Ag}^+(\text{aq}) \rightarrow 2\text{Ag} + \text{Cu}^{2+}(\text{aq})$  ✓  
 (3)  $E^\circ_{\text{cell}}$  during current flow is  $0.46\text{V}$  ✓  
 (4) Current flows from Ag electrode to Cu electrode when cell is operated. ✓  
 (5)  $\text{Cl}^-$  ions move to the anode compartment during cell operation through salt bridge ✓

27. Compound  $\text{CH}_3-\text{C}_6\text{H}_4-\text{NH}_2$  is reacted with dil  $\text{HNO}_2$  at  $0 - 5^\circ\text{C}$ . Product formed is mixed with phenol and  $\text{NaOH(aq)}$  solution. Products formed can be,



28.  $(\text{CH}_3)_3\text{C}-\text{Br} + \text{OH}^-(\text{aq}) \rightarrow (\text{CH}_3)_3\text{C}-\text{OH} + \text{Br}^-(\text{aq})$  is a multistep reaction which occurs via two steps. Incorrect statement is,



- (1) Reaction is first order with respect to  $(\text{CH}_3)_3\text{CBr}$  and zero order with respect to  $[\text{OH}^-(\text{aq})]$   
 (2) Changing  $[\text{OH}^-(\text{aq})]$  no change in rate of reaction  
 (3) Unit of rate constant is  $\text{dm}^3\text{mol}^{-1}\text{s}^{-1}$   
 (4) Graph  $\log(\text{rate})$  Vs  $\log[(\text{CH}_3)_3\text{CBr}]$  is straight line with positive gradient and positive intercept..  
 (5) This reaction is unimolecular.

29.  $2\text{FeCl}_3(\text{aq}) + \text{Zn(s)} \rightarrow 2\text{FeCl}_2(\text{aq}) + \text{ZnCl}_2(\text{aq})$   $100\text{ cm}^3$  of  $0.18\text{ mol dm}^{-3}$   $\text{FeCl}_3$  solution is mixed with  $\text{Zn(s)}$ . 25% of  $\text{Fe}^{2+}$  is given after 3 mins. Rate of oxidation of Zn is, (in  $\text{mol dm}^{-3}\text{s}^{-1}$ )

- (1)  $1.5 \times 10^{-4}$  (2)  $25 \times 10^{-5}$  (3)  $3.75 \times 10^{-5}$  (4)  $7.5 \times 10^{-4}$  (5)  $2.5 \times 10^{-6}$

30. Correct statement regarding  $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2(\text{s})$  is,

- (1) It has only dative covalent bonds ✗  
 (2) It's IUPAC name is pentaamminechloridocobalt (II) dichloride ✗  
 (3) Makes yellow precipitate with  $\text{AgNO}_3$  solution. ✗  
 (4) Complex cation is octahedral. ✓  
 (5) Precipitate makes with  $\text{Pb}(\text{CH}_3\text{COO})_2$  is dissolved when heating.

For each of the questions 31 to 40, one or more responses out of the four responses (a), (b), (c) and (d) given is / are correct. Select the correct / responses in accordance with the instructions given on your answer sheet.

| 1                            | 2                            | 3                            | 4                            | 5                                                       |
|------------------------------|------------------------------|------------------------------|------------------------------|---------------------------------------------------------|
| Only (a) and (b) are correct | Only (b) and (c) are correct | Only (c) and (d) are correct | Only (a) and (d) are correct | Any other number or combination of responses is correct |

31. Correct statement/ statements regarding experiment of thiosulfate and acid used to find reaction orders,  
 (a) Time needed to form constant amount of  $S_2O_3^{2-}$  is measured.  
 (b) Time needed to form constant amount of S is measured. ✓  
 (c)  $SO_2(g)$  formed as a product ✓  
 (d) Concentration of  $S_2O_3^{2-}$  must be known to find reaction order with respect  $S_2O_3^{2-}$  ①
32. Correct statement/ statements regarding reaction between ethene and  $Br_2$   
 (a) It is an electrophilic addition. ✓  
 (b) Cyclic bromonium ion is formed as reaction intermediate ✓  
 (c) Ethene acts as an electrophile ✗  
 (d)  $Br^-$  acts as an electrophile ✓ ⑤
33. Correct statement/ statements is / are,  
 (a) All aldehydes positive for fehling test ✗  
 (b) Methanoic acid does not answer for the fehling's test. ✓  
 (c) Benzaldehyde does not undergo condensation reaction. ✓ ①  
 (d) No precipitate is given Brady reagent with acetone ✗
34. Chemical species that gives green precipitate with  $NaOH(aq)$   
 (a)  $[Ni(H_2O)_6]^{2+}$  ✓ (b)  $[Cu(H_2O)_5]^{2+}$  ✗ (c)  $[Co(H_2O)_6]^{2+}$  ✗ (d)  $[Zn(H_2O)_6]^{2+}$  ✗ ⑤
35. Select correct statement/ statements,  
 (a) Molecular collisions of all gases are perfectly elastic. ✗  
 (b) Boyle's law can be explained using assumptions of molecular kinetic theory. ✓  
 (c) Ideal gaseous particles are point masses. ✓  
 (d) All gaseous molecules at constant pressure have same speed, ✗ ②
36. Correct statements regarding industrial process  
 (a) Haber - Bosch process of manufacture of  $NH_3(g)$  maintained at temperature above  $800^\circ C$  ✗  
 (b) Rh used as catalyst in the manufacture of nitric acid using ostwald process. ✓  
 (c) Production of  $H_2SO_4$  acid using contact process, the reaction produced  $SO_3$  is an exothermic process ✓  
 (d) Rutile used to produce  $TiO_2$  has two oxides  $TiO_2$  and  $FeO$  ✗ ②

37. Correct statement/ statements regarding saturated solution of FeS is,

- (a) Solubility of FeS depends on pH value. ✓  
 (b) Adding small amount of acid, increases solubility of FeS. ✓  
 (c) Adding small amount of Na<sub>2</sub>S increases concentration of Fe<sup>2+</sup> (aq) ✗ (1)  
 (d) No change in solubility when adding NaOH solution. ✗

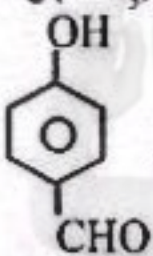
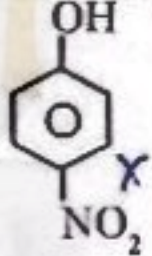
38. An ideal slution is made by mixing X and Y volatile liquids at T temperature

Saturated vapour pressures of X and Y respectively at T temperature are  $6 \times 10^4$  Pa and  $2 \times 10^4$  Pa . Mole fraction of X in liquid state at equilibrium is 0.4

Correct statement/ statements regarding this equilibrium system is / are,

- (a) Partial pressure of X is  $2.4 \times 10^4$  Pa. ✓  
 (b) Mole fraction of X in vapour phase is greater than mole fraction of Y in vapour phase. ✓  
 (c) Total pressure of vapour phase is  $3.6 \times 10^4$  Pa. ✓  
 (d) Partial pressure of Y is  $1.2 \times 10^5$  Pa ✗ (5)

39. Compound Y gives gas which turns lime water milky when it reacts with NaHCO<sub>3</sub>. It does not decolourize Br<sub>2</sub> water and gives silver mirror with [Ag(NH<sub>3</sub>)<sub>2</sub>]<sup>+</sup> compound Y can be,

- (a)  $\text{CH}_3 - \underset{\text{CHO}}{\text{CH}} - \text{CH}_2 - \text{COOH}$  ✓  
 (b)  ✗  
 (c)  ✗  
 (d)  $\text{CH}_3 - \underset{\text{Cl}}{\text{CH}} - \text{CH}_2 - \text{CHO}$  ✗ (5)

40. Correct statement/ statements regarding environmental pollution is / are,

- (a) CFC gas releases Cl free radicals at higher atomosphere when it exposed to high energy UV radiation  
 (b) Only NO gas contributes to make photochemical smog ✓  
 (c) O<sub>2</sub> gas produced by O free radicals which forms by decomposition of NO<sub>2</sub> gas in the presence of sunlight ✗  
 (d) All gases those absorbs infrared rays are green house gas. ✗ (1)

• Instruction from question number 41 - 50

In questions No. 41 to 50 two statements are given in respect of each question. From the Table given below, select the response out of the responses (1), (2), (3), (4) and (5) that best fits the two statements given for each of the questions and mark appropriately on your answer sheet

| Response | first statement | Second statement                                        |
|----------|-----------------|---------------------------------------------------------|
| 1        | True            | True and correctly explains the first statement         |
| 2        | True            | True but does not explain the first statement correctly |
| 3        | True            | False                                                   |
| 4        | Fasle           | True                                                    |
| 5        | False           | False                                                   |

| 1 <sup>st</sup> statement                                                                                               | 2 <sup>nd</sup> statement                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 41. Effective nuclear charge of any element in any period of the periodic table increases from left to right. ✗         | Inner shell electrons of an atom very slightly affect towards its valence electrons. ✗ (5)                                                                                                                                                                |
| 42. Phenol undergoes Friedlecraft alkylation easily than that of benzene. ✗                                             | -OH group of the phenol, activates the benzene ring ✓ (4)                                                                                                                                                                                                 |
| 43. Vapour pressure of ethyleneglycol is less than vapour pressure of water. ✓ (HO-CH <sub>2</sub> CH <sub>2</sub> -OH) | No hydrogen bonds in between molecules of ethylene glycol. ✗ (3)                                                                                                                                                                                          |
| 44. Melting point of Boron is exceptionally higher than the melting points of other elements in group 13. ✓             | B is a non-metal ✗ (3)                                                                                                                                                                                                                                    |
| 45. Growth of algae in water is higher due to eutrophication. ✗                                                         | NO <sub>3</sub> <sup>-</sup> is the nutrient that reduces the growth of algae in water. ✗ (3)                                                                                                                                                             |
| 46. H <sub>2</sub> O has higher critical temperature than CO <sub>2</sub> . ✓                                           | Gases those with strong intermolecular interactions have higher critical temperature. ✓ (1)                                                                                                                                                               |
| 47. H atoms that bonded directly to carbonyl carbon are acidic. ✗                                                       | Carbonyl group acts as strong electron accepting group. ✓ (4)                                                                                                                                                                                             |
| 48. Adding HNO <sub>3</sub> to Ag <sub>3</sub> PO <sub>4</sub> (s) solution increases its solubility. ✓                 | Adding dilute acid following reaction tends towards right and decreases [PO <sub>4</sub> <sup>3-</sup> (aq)] ✓<br>H <sub>3</sub> O <sup>+</sup> (aq) + PO <sub>4</sub> <sup>3-</sup> (aq) ⇌ HPO <sub>4</sub> <sup>2-</sup> (aq) + H <sub>2</sub> O(l) (1) |
| 49. Total fatty matter of a soap decided by TFM value. ✓                                                                | Soap reduces the surface tension of water. ✓ (2)                                                                                                                                                                                                          |
| 50. Diluted acid can't act as an oxidizing agent ✗                                                                      | H <sub>2</sub> (g) releases when adding dil. HNO <sub>3</sub> to Mg. ✓ (4)                                                                                                                                                                                |