

Chemistry**Section A****Q.1. Select the correct alternatives and write the answers**

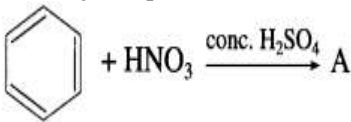
- 1) The by-product formed during the preparation of terylene fibre is **1**
- A) glycerol
 - B) propylene glycol
 - C) ethylene glycol
 - D) ethyl alcohol
- 2) Which of the following carbohydrates cannot undergo hydrolysis? **1**
- A) Glucose
 - B) Sucrose
 - C) Cellulose
 - D) Maltose
- 3) In which of the following series all the elements are radioactive in nature **1**
- A) Lanthanides
 - B) Actinides
 - C) d-block elements
 - D) s-block elements
- 4) The nanomaterial based catalyst are usually **1**
- A) homogeneous catalyst
 - B) heterogeneous catalyst
 - C) good catalyst
 - D) bad catalyst
- 5) The decreasing order for negative values for electron gain enthalpies is **1**
- A) $F > Cl > Br$
 - B) $Cl > F > Br$
 - C) $Br > Cl > F$
 - D) $F > Br > Cl$

- 6) For the reaction $\text{N}_{2(g)} + 3\text{H}_{2(g)} = 2\text{NH}_{3(g)}$; Which of the following is valid ? 1
- A) $\Delta H = \Delta U$
B) $\Delta H < \Delta U$
C) $\Delta H > \Delta U$
D) $\Delta H = 2\Delta H$
- 7) When phenol is heated with cone. HNO_3 in presence of cone. H_2SO_4 it yields 1
- A) o-nitrophenol
B) p-nitrophenol
C) 2, 4, 6-trinitrophenol
D) m-nitrophenol
- 8) Interhalogen compound used as a fluorinating agent is 1
- A) IF_7
B) BrF_5
C) IF_5
D) ClF_3
- 9) In SF_6 , sulphur atom undergoes hybridisation 1
- A) sp^3
B) sp^3d
C) sp^3d^2
D) sp^3d^3
- 10) $[\text{CO}(\text{NH}_3)_6]^{3+}$ is an orbital complex and is in nature. 1
- A) inner, paramagnetic
B) inner, diamagnetic
C) outer, paramagnetic
D) outer, diamagnetic
- Q. 2. Answer the following questions :**
- 11) Why do the compounds of transition metals exhibit magnetic properties? 1
- 12) What is meant by +I effect ? 1
- 13) Classify the following polymers as addition or condensation. 1
- (i) PVC (ii) Polyamides
(iii) Polystyrene
(iv) Polycarbonates
(v) Novolac

- 14) Arrange the following acids in their increasing order of acidic strength. 1
Acetic acid, phenyl acetic acid, p-nitro phenyl acetic acid.
- 15) Do tertiary amines have 'H' bonded to 'N'? 1
- 16) What is a redox reaction? 1
- 17) What are structures of diamond and graphite? 1
- 18) Draw the flow chart diagram to show the classification of polymers based on the type of polymerization. 1

Section B

Attempt any EIGHT of the following questions :

- 19) Define Lewis bases and Lewis acids with respect to a coordination compound. 2
- 20) Define resistivity. What are its units? 2
- 21) Identify the product A of following reaction. 2

- 22) Aniline cannot be prepared by Gabriel phthalimide synthesis. 2
- 23) What happens when acetyl chloride is treated with dibenzyl cadmium? Give reaction. 2
- 24) What are polysaccharides? 2
- 25) The rate law for the reaction $2\text{NO}_{(g)} + \text{Cl}_{2(g)} \rightarrow 2\text{NOCl}_{(g)}$ is given by rate = $k[\text{NO}][\text{Cl}_2]$. The reaction occurs in the following steps : 2
 (i) $\text{NO}_{(g)} + \text{Cl}_{2(g)} \rightarrow \text{NOCl}_{2(g)}$
 (ii) $\text{NOCl}_{2(g)} + \text{NO}_{(g)} \rightarrow 2\text{NOCl}_{(g)}$
 (a) Is NOCl_2 a catalyst or reaction intermediate? Why?
 (b) Identify the rate determining step
- 26) How will you convert the following? 2
Phenyl acetonitrile to β -phenylethyl amine.
- 27) Identify the strongest and the weakest oxidizing agents from the electrochemical series. 2
- 28) What is electrochemistry? 2
- 29) What is the oxidation state of oxygen in compounds 2
(i) O_2F_2 and (ii) H_2O_2
- 30) What is monosaccharide? 2

Section C

Attempt any EIGHT of the following questions :

- 31) Explain the hydrolysis of a salt of weak acid and strong base. 3
OR
A solution of sodium acetate, CH_3COONa reacts basic explain.
- 32) How will you prepare the following : 3

Isopropyl chloride (2-chloropropane) from isopropyl alcohol using
(i) PCl_3 (ii) PCl_5 (iii) SOCl_2 .
- 33) How many series of d-block elements are present in the long-form periodic table? Give their 3
general electronic configuration.
- 34) What are the features (or key points) of order of a reaction? 3
- 35) Write the classification of amino acids, giving examples. 3
- 36) Define thermodynamic equilibrium. Mention different types of thermodynamic equilibria. 3
- 37) The density of silver having atomic mass $107.8 \text{ gram mol}^{-1}$ is $10.8 \text{ gram cm}^{-3}$. If the edge 3
length of cubic unit cell is $4.05 \times 10^{-8} \text{ cm}$, find the number of silver atoms in the unit cell.
($N_A = 6.022 \times 10^{23}$, $1\text{\AA} = 10^{-8} \text{ cm}$)
- 38) What are the exceptions to Henry's law? Why ? 3
- 39) Construct a galvanic cell from the electrodes $\text{Co}^{3+} | \text{Co}$ and $\text{Mn}^{2+} | \text{Mn}$. 3
 $E^\circ_{\text{Co}} = 1.82 \text{ V}$, $E^\circ_{\text{Mn}} = -1.18 \text{ V}$. Calculate E°_{cell}
- 40) Write the preparation of the following synthetic rubbers and give their uses : 3
(1) Buna-S or styrene-butadiene rubber (SBR) (2) Neoprene rubber
- 41) Give the examples of spontaneous processes. 3
- 42) Draw the resonance structures of aromatic ethers. 3

Section D

Attempt any THREE of the following questions :

- 43) Discuss SN^2 mechanism of methyl bromide using aqueous KOH. Draw energy profile 4
diagram.
OR
Discuss the mechanism of alkaline hydrolysis of methyl bromide or Bromomethane.
- 44) Deduce the mathematical expression of first law of thermodynamics for the following 4
processes :
(1) Isothermal process
(2) Isobaric process
(3) Isochoric process
(4) Adiabatic process.
- 45) Derive the integrated rate law for the first-order reaction. 4
- 46) Explain the extraction of iron from haematite. 4