Techior Solutions Pvt. Ltd.

HSC Chemistry Sample Paper

Total Time: 3 Hr | Total Marks: 70.0

Chemistry

Section A

MCQ Single Correct

1) The by-product formed during the preparation of terylene fibre is **1.0**

- **A)** glycerol
- **B)** propylene glycol
- **C)** ethylene glycol
- **D)** ethyl alcohol

2) Which of the following carbohydrates cannot undergo hydrolysis? **1.0**

- **A)** Glucose
- **B)** Sucrose
- **C)** Cellulose
- **D)** Maltose

3) In which of the following series all the elements are radioactive in nature **1.0**

- **A)** Lanthanides
- **B)** Actinides
- **C)** d-block elements
- **D)** s-block elements

4) The nanomaterial based catalyst are usually **1.0**

- **A)** homogeneous catalyst
- **B)** heterogeneous catalyst
- **C)** good catalyst
- **D)** bad catalyst

5) The decreasing order for negative values for electron gain enthalpies is **1.0**

- **A)** F > Cl > Br
- **B)** Cl > F > Br
- **C)** Br > Cl > F
- **D)** F > Br > Cl

6) For the reaction $N_{2(g)} + 3H_{2(g)} = 2NH_{3(g)}$; Which of the following is valid ? **1.0**

- **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 **1.0**

A) o-nitrophenol
B) p-nitrophenol
C) 2, 4, 6-trinitrophenol
D) m-nitrophenol

8) Interhalogen compound used as a fluorinating agent is **1.0**

A) IF_7
B) BrF_5
C) IF_5
D) ClF_3

9) In SF_6, sulphur atom undergoes hybridisation **1.0**

A) sp^3
B) sp^3d
C) sp^3d^2
D) sp^3d^3

10) $[CO(NH_3)_6]^{3+}$ is an orbital complex and is in nature. **1.0**

A) inner, paramagnetic
B) inner, dimagnetic
C) outer, paramagnetic
D) outer, dimagnetic

11) Why do the compounds of transition metals exhibit magnetic properties? **1.0**

12) What is meant by +I effect ? **1.0**

13) Classify the following polymers as addition or condensation. **1.0**
(i) PVC (ii) Polyamides
(iii) Polystyrene
(iv) Polycarbonates
(v) Novolac

14) Arrange the following acids in their increasing order of acidic strength. **1.0**

Acetic acid, phenyl acetic acid, p-nitro phenyl acetic acid.

15) Do tertiary amines have 'H' bonded to 'N? **1.0**

16) What is a redox reaction ? **1.0**

17) What are structures of diamond and graphite ? **1.0**

18) Draw the flow chart diagram to show the classification of polymers based on the type of polymerization. **1.0**

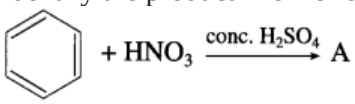
Section B

Short Description

19) Define Lewis bases and Lewis acids with respect to a coordination compound. **2.0**

20) Define resistivity. What are its units ? **2.0**

21) Identify the product A of following reaction. **2.0**



22) Aniline cannot be prepared by Gabriel phthalimide synthesis. **2.0**

23) What happens when acetyl chloride is treated with dibenzyl cadmium ? Give reaction. **2.0**

24) What are polysaccharides? **2.0**

25) The rate law for the reaction $2NO_{(g)} + Cl_{2(g)} \rightarrow 2NOCl_{(g)}$ is given by rate = $k[NO][Cl_2]$. The reaction occurs in the following steps : **2.0**

(i) $NO_{(g)} + Cl_{2(g)} \rightarrow NOCl_{2(g)}$

(ii) $NOCl_{2(g)} + NO_{(g)} \rightarrow 2NOCl_{(g)}$

(a) Is $NOCl_2$ a catalyst or reaction intermediate? Why?

(b) Identify the rate determining step

26) How will you convert the following? **2.0**

Phenyl acetonitrile to β-phenylethyl amine.

27) Identify the strongest and the weakest oxidizing agents from the electrochemical series. **2.0**

28) What is electrochemistry? **2.0**

29) What is the oxidation state of oxygen in compounds **2.0**

(i) O_2F_2 and

(ii) H_2O_2?

30) What is monosaccharide? **2.0**

Section C

Medium Description

31) Explain the hydrolysis of a salt of weak acid and strong base. **3.0**

OR

A solution of sodium acetate, CH_3COONa reacts basic explain.

32) How will you prepare the following : **3.0**

Isopropyl chloride (2-chloropropane) from isopropyl alcohol using

(i) PCI_3

(ii) PCI_5

(iii) $SOCI_2$.

33) How many series of d-block elements are present in the long-form periodic table? Give their general electronic configuration. **3.0**

34) What are the features (or key points) of order of a reaction? **3.0**

35) Write the classification of amino acids, giving examples. **3.0**

36) Define thermodynamic equilibrium. Mention different types of thermodynamic equilibria. **3.0**

37) The density of silver having atomic mass 107.8 gram mol^{-1} is 10.8 gram cm^{-3}. If the edge length of cubic unit cell is 4.05×10^{-8} cm, find the number of silver atoms in the unit cell. ($N_A = 6.022 \times 10^{23}$, 1Å = 10^{-8} cm) **3.0**

38) What are the exceptions to Henry's law? Why ? **3.0**

39) Construct a galvanic cell from the electrodes Co^{3+} | Co and Mn^{2+}| Mn. **3.0**
E°_{Co} = 1.82 V, E°_{Mn} = - 1.18 V. Calculate E°_{cell}

40) Write the preparation of the following synthetic rubbers and give their uses : **3.0**
(1) Buna-S or styrene-butadiene rubber (SBR) (2) Neoprene rubber

41) Give the examples of spontaneous processes. **3.0**

42) Draw the resonance structures of aromatic ethers. **3.0**

Section D

Long Description

43) Calculate the spin only magnetic moment of La^{3+}. Compare the value with that given in the table. **4.0**

44) Discuss SN^2 mechanism of methyl bromide using aqueous KOH. Draw energy profile diagram. **4.0**
OR
Discuss the mechanism of alkaline hydrolysis of methyl bromide or Bromomethane.

45) Deduce the mathematical expression of first law of thermodynamics for the following processes : **4.0**
(1) Isothermal process
(2) Isobaric process
(3) Isochoric process
(4) Adiabatic process.

46) Derive the integrated rate law for the first-order reaction. **4.0**