

Special Practice Exam No. 1 (2021-2022)**Date:****Std.: 12th****Marks: 70****Seat No. :****Sub. : Chemistry****Time: 3 Hours****General Instructions:**

1. Question paper consists of **31** questions divided in to **FOUR** sections, namely **A, B, C** and **D**.
 - (1) **Section-A:** Q. No. 1 contains **10 multiple choice** type questions carrying **one mark** each.
Q. No. 2 contains **8 very short answer** type questions carrying **one mark** each.
 - (2) **Section-B:** Q. No. 3 to Q. No. 14 are **12 short answer-I** type questions carrying **two marks** each.
Attempt any **eight** questions.
 - (3) **Section-C:** Q. No. 15 to Q. No. 26 are **12 short answer-II** type questions carrying **three marks** each. Attempt any **eight** questions.
 - (4) **Section-D:** Q. No. 27 to Q. No. 31 are **5 long answer** type questions carrying **four marks** each.
Attempt any **three** questions.
2. Figures to the right indicate full marks.
3. Start each section on a new page.
4. For each MCQ, the correct answer must be written along with its alphabet:
e.g. (a)...../ (b)...../ (c)...../ (d)...../ etc.
5. Evaluation of each MCQ would be done for the first attempt only.
6. Draw neat labeled diagrams and write balanced chemical equations wherever necessary.
7. Use log table if necessary. Use of calculator is not allowed.

Constants : $R = 8.314 \text{ JK}^{-1}\text{mol}^{-1}$ Atomic number of Fe = 26**Section - A****Q. 1 Select and write the correct answer :****10**

- i) The coordination number of atoms in bcc crystal lattice is,
(a) 2 (b) 4 (c) 6 (d) 8
- ii) The colligative property of a solution is,
(a) vapour pressure (b) boiling point (c) osmotic pressure (d) freezing point
- iii) The pH of 10^{-8} M of HCl is
(a) 8 (b) 7 (c) less than 7 (d) greater than 7
- iv) BF_3 is
(a) Lewis acid (b) Lewis base
(c) Amphoteric compound (d) Electrolyte only
- v) Which of the following is an intensive property?
(a) Enthalpy (b) Weight (c) Refractive index (d) Volume

(P.T.O.)

- Q.10 Give difference between double salt and Coordination compound.
- Q.11 Give the equations of reactions for the preparation of phenol from isopropyl benzene.
- Q.12. Write reaction to convert
- (a) ethyl bromide into ethyl amine
 - (b) ethyl cyanide into propylamine.
- Q.13 What are carbohydrates? Give example of carbohydrate.
- Q.14 Give the full form of
- a) XRD
 - b) FTIR

Section-C

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Attempt any Eight of the following :

- Q.15 Define Crystalline solid. Cu crystallizes in fcc unit cell with edge length of 495 pm. What is the radius of Cu atom?
- Q.16 Derive relationship between pH and pOH. Give example of salt of strong acid and strong base.
- Q.17 What is unit cell? Calculate the maximum work when 24 g of O₂ expanded isothermally and reversibly from the pressure of 1.6 bar to 1.0 bar at 298 K.
- Q.18 Derive the expression for integrated rate law for first order reaction.
- Q.19 What is salt bridge? What are the functions of salt bridge?
- Q.20 What is meant by diamagnetic and paramagnetic? Give one example of diamagnetic and paramagnetic transition metal and lanthanide metal.
- Q.21 What are strong field and weak field ligands? Give one example of each.
- Q.22 What are alkyl halide? How are they classified?
- Q.23
- a) Explain the action of zinc dust on phenol
 - b) Explain Kolbes reaction.
- Q.24 Write reaction showing conversion of p-bromoisopropyl benzene into p-isopropylbenzoic acid.
- Q.25
- a) How will you convert ethyl bromide to ethyl alcohol.
 - b) Give example of trisaccharide carbohydrates
 - c) Calculate EAN of Fe in K₄[Fe(CN)₆]
- Q.26 Explain the trend in the following atomic properties of group 16 elements.
- a) Atomic radii
 - b) Ionization enthalpy
 - c) Electronegativity

(P.T.O.)

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- vi) Which of the following have d^0s^0 configuration?
 (a) Sc^{+3} (b) Ti^{+4} (c) V^{+5} (d) All of the above
- vii) The formula of the complex Sodium hexacyanoferrate (III) is
 (a) $[NaFe(CN)_6]$ (b) $Na_2[Fe(CN)_6]$ (c) $Na[Fe(CN)_6]$ (d) $Na_3[Fe(CN)_6]$
- viii) Resorcinol on distillation with zinc dust gives
 (a) Cyclohexane (b) Benzene (c) Toluene (d) Benzene-1,3-diol
- ix) Benzaldehyde does NOT show positive test with
 (a) Schiff reagent (b) Tollen's reagent
 (c) Sodium bisulphite solution (d) Fehling solution
- x) Isobutylamine is an example of
 (a) 2^0 amine (b) 3^0 amine
 (c) 1^0 amine (d) quaternary ammonium salt

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2 Answer the following questions:

- i) What are isotonic solutions?
- ii) 'Dissolving sugar in a hot coffee' - whether the process is spontaneous or non-spontaneous.
- iii) What is cell constant?
- iv) What is the oxidation state of Te in TeO_2 ?
- v) What is meant by 'Shielding of electrons' in an atom?
- vi) How is glucose stored in the animal body?
- vii) Write one example each of addition polymer and condensation polymer.
- viii) Define: Synthetic fibres.

Section-B

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Attempt any Eight of the following :

- Q.3 How is molar mass of a solute determined by osmotic pressure measurements?
- Q.4 State and explain Raoult's law.
- Q.5 Derive an expression for pressure-volume (PV) work.
- Q.6 How many moles of electrons are passed when 0.8 ampere current is passed for 1 hour through molten $CaCl_2$.
- Q.7 In a first order reaction 60% of the reactant decomposes in 45 min. Calculate the half life for the reaction.
- Q.8 Give two uses of chlorine.
- Q.9 Why does chromium and copper show abnormal electronic configuration?

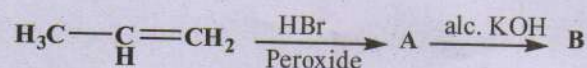
Section-D

Attempt any three of the following questions:

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Q.27 a) Explain Wurtz reaction

b) Complete the following reaction



Q.28 What is Grignard reagent? What is the action of Grignard reagent on

a) Formaldehyde

b) Acetaldehyde

c) Acetone

Q.29 a) Write one property of a buffer solution.

b) State Hess's law of constant heat summation. State its application.

c) Write electrode reaction during electrolysis of molten KCl.

Q.30 a) Define rate of reaction

b) The pK_a values of HCl is -7.0 and that of HI is -10.0, which is stronger acid?

c) The atomic number of an element is 90. Is this element diamagnetic or paramagnetic?

Q.31 a) Name and draw structure of repeating unit of natural rubber.

b) Define the term

i) Nanoscience

ii) Nanotechnology
