

Roll No.: 02.....  
Total No. of Questions : 21]

053/A  
[ Total No. of Printed Pages : 5

SS  
2325

ਸਲਾਨਾ ਪਰੀਖਿਆ ਪ੍ਰਣਾਲੀ

## CHEMISTRY

Time Allowed : 3 Hours

Maximum Marks : 70

(English Version)

- Note :
- You must write the subject-code / paper-code 053 in the box provided on the title page of your answer-book.
  - Make sure that the answer-book contains 32 pages (including title page) and are properly serialised as soon as you receive it.
  - Question/s attempted after leaving blank page/s in the answer book should not be evaluated.
  - There will be one theory paper comprising of 21 questions. All questions are compulsory.
  - Question Nos. 1 will have 20 sub parts and each part will carry 1 mark. All questions are compulsory. This question will be of multiple choice, true/false and comprehensive.
  - Question Nos. 2 to 15 will be of two marks each. There will be internal choice in four questions. All questions are compulsory.
  - Question Nos. 16 to 19 will be of three marks each. There will be internal choice in two questions. All questions are compulsory.
  - Question Nos. 20 and 21 will be of five marks each. There will be internal choice in them.
  - Use of un-programmable calculator is allowed. The log tables can be used.
  - Punjabi and Hindi Versions of questions are true translation of English Version. So in the case of any confusion consider English Version to be correct.

Read the following paragraph and answer the questions given below :

It has been observed that nucleus of a living cell is responsible for this transmission of inherent characters, also called heredity. The particles in the nucleus of cell, responsible for heredity, are called chromosomes which are made up of proteins and another type of biomolecules called nucleic acids. These are mainly of two types, the deoxyribonucleic acids (DNA) and ribonucleic acid (RNA). Since nucleic acids are long chain polymers of nucleotides, so they are also called polynucleotides. RNA molecules are of three types and they perform different functions. They are named as messenger RNA (m-RNA), ribosomal RNA (r-RNA) and transfer RNA (t-RNA).

- Give full form of DNA and RNA. 1
- How many types of RNA are there ? 1
- Who is responsible for heredity ? 1
- Define heredity. 1
- How many types of nucleic acids are there ? 1

True / False

- CO is stronger ligand than  $\text{Cl}^{-1}$ . 1
- The colour produced in Victor Meyer test for primary alcohol is deep blue. 1
- Formic acid is obtained from red ants. 1

(ix) IUPAC name of Acetone is Butanone.

1

(x)  $\text{Ni}(\text{CO})_4$  is diamagnetic.



1

**Multiple choice questions.**

(xi) The units of ebullioscopic constant is :

1

- (a)  $\text{K kg mol}^{-1}$  (b)  $\text{mol kg K}^{-1}$   
(c)  $\text{kg mol}^{-1} \text{K}^{-1}$  (d)  $\text{K mol kg}^{-1}$

(xii) Galvanisation is applying a coating of :

1

- (a) Cr (b) Cu (c) Zn (d) Pb

(xiii) The units of first order reaction :

1

- (a)  $\text{s}^{-1}$  (b) s (c)  $\text{mol L}^{-1}$  (d)  $\text{L}^{-1} \text{s}$

(xiv) What is the mole fraction of benzene in solution containing 30% by mass in carbon tetrachloride ?

1

- (a) 0.540 (b) 0.459 (c) 0.500 (d) 0.300

(xv) The porous membrane used in reverse osmosis plant is made up by :

1

- (a) Cellulose acetone (b) Potassium nitrate  
(c) Mercuric iodide (d) Starch



(xvi) What is DDT among the following :

1

- (a) Fertilizer.  
(b) Biodegradable pollutant.  
(c) Non-Biodegradable pollutant.  
(d) Green House gas.

(xvii) In the following, strongest Acid is :

1

- (a)  $\text{CH}_3\text{CH}_2\text{COOH}$  (b)  $\text{CH}_3\text{COOH}$   
(c)  $\text{C}_6\text{H}_5\text{COOH}$  (d)  $\text{C}_6\text{H}_5\text{CH}_2\text{COOH}$

(xviii) Benzoic Acid reacts with  $\text{LiAlH}_4$  to give :

1

- (a) Ethylene (b) Methyl Benzene  
(c) Phenol (d) Benzyl Alcohol

(xix) Vinegar is dilute aqueous solution of :

1

- (a) Ethanoic acid. (b) Benzoic acid.  
(c) Citric acid. (d) Oxalic acid.



(xx) The oxidation state of Fe in  $[\text{Fe}(\text{CN})_6]^{-3}$  :

1

- (a) +3 (b) +2 (c) +4 (d) -3

Two Mark Questions

Write two differences between double salt and co-ordination compounds.



2

Define monodentate ligands and give example.

Why do alcohols have higher boiling point than haloalkanes of the same molecular mass?

2

OR

How will you convert propan-1-ol to propan-2-ol?

2

Describe Rosenmund reduction.

2

OR

Lower carbocyclic acids are highly soluble in water. Explain.

2

How will you obtain chlorobenzene from aniline?



2

Explain why methylamine is a stronger base than Ammonia?

2

Give two differences between DNA and RNA.

2

Give two differences between ideal and non-ideal solution.

2

Calculate the molal elevation constant of water, it being given that 0.1 molal aqueous solution of a substance boils at  $100.052^{\circ}\text{C}$ .

2

OR

18 gm of glucose ( $\text{C}_6\text{H}_{12}\text{O}_6$ ) is dissolved in 1 kg of water in a saucepan. At what temperature will the water boil at 1.013 bar pressure?  $K_b$  for water is  $0.52\text{K kg mol}^{-1}$ .

2

Give two differences between Galvanic Cell and Electrolytic cell.



2

How many Coulombs of electricity are required for complete oxidation of 90 gm of  $\text{H}_2\text{O}$ ?

2

Give two differences between order of reaction and molecularity of reaction.

2

[Turn over

14. The rate constant for a first order reaction is  $60 \text{ sec}^{-1}$ . How much time will it take to reduce the concentration of the reaction to  $1/10^{\text{th}}$  of its initial value? 2

OR

Calculate the half-life time of a first order reaction having  $K = 8 \text{ min}^{-1}$ . 2

15. Why do Zr and Hf exhibit similar properties? 2

Three mark Questions.

16. Calculate the two third life of a first reaction having  $K = 5.48 \times 10^{-14} \text{ s}^{-1}$ . 3

17. Compare the acidic character of Primary, Secondary and Tertiary alcohol. 3

OR

Explain Reimer Tiemann reaction of Phenols. 3

18. Why is aniline less basic than ethylamine? 3

19. Calculate the molar conductance  $\Lambda_m^\circ$  for  $\text{CaCl}_2$ , given that  $\lambda(\text{Ca}^{+2}) = 119.5 \text{ S cm}^2 \text{ mol}^{-1}$ ,  $\lambda(\text{Cl}^-) = 76.3 \text{ S cm}^2 \text{ mol}^{-1}$ . 3

OR

Write the Nearest equation and calculate the e.m.f of the following cell at 298K. 3

$\text{Fe(s)} | \text{Fe}^{2+} (0.001\text{M}) || \text{H}^+ (1\text{M}) - \text{H}_2 (1\text{atm}) | \text{Pt}$

Given  $E^\circ_{\text{Fe}^{+2} | \text{Fe}} = -0.44 \text{ V}$

5 marks Answer type questions.

20. Write the reaction :

1+1+1+1=

(i) Wurtz-fitting reaction

(ii) Ullmann reaction

(iii) Gattermann reaction

(iv) Hunsdiecker reaction

(v) Balz-Schiemann reaction

OR

(a) Write four differences between  $SN^2$  (substitution nucleophilic biomolecular reaction) and  $SN^1$  (substitution nucleophilic unimolecular reaction). 4+1=5

(b) Define Optical activity.



21. Write the following :

(a) Give three differences between Lanthanoids and Actinoids. 3+2=5

(b) Explain why  $Cu^{+2}$  salts are coloured while  $Zn^{+2}$  salts are colourless ?  
OR

(a) Transition metals form alloys with other metals. Explain. 2+3=5

(b) How many unpaired electrons are present in  $Fe^{+3}$ ,  $Zn^{+2}$  and  $Mn^{+2}$  ?



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