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

053/C

[Total No. of Printed Pages : 5

SS

2325

ਸਲਾਨਾ ਪਰੀਖਿਆ ਪ੍ਰਣਾਲੀ

CHEMISTRY

Time Allowed : 3 Hours

Maximum Marks : 70

(English Version)

Note :

(i) You must write the subject-code/paper-code 053 in the box provided on the title page of your answer-book.

(ii) Make sure that the answer-book contains 32 pages (including title page) and are properly serialled as soon as you receive it.

(iii) Question/s attempted after leaving blank page/s in the answer-book would not be evaluated.

(iv) There will be one theory paper comprising of 21 questions. All questions are compulsory.

(v) 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.

(vi) Question Nos. 2 to 15 will be of two marks each. There will be internal choice in four questions. All questions are compulsory

(vii) Question Nos. 16 to 19 will be of three marks each. There will be internal choice in two questions. All questions are compulsory

(viii) Question Nos. 20 and 21 will be of five marks each. There will be internal choice in them.

(ix) Use of un-programmable calculator is allowed. The log tables can be used.

(x) 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.

1. **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).

(i) Who is responsible for heredity ?   1

(ii) Define heredity.   1

(iii) How many types of nucleic acids are there ?   1

(iv) Give full form of DNA and RNA.   1

(v) How many types of RNA are there ?   1

True / False

(vi) Formic acid is obtained from red ants. ✓ 1

(vii) IUPAC name of Acetone is Butanone. 1

(viii) Ni $(CO)_4$ is diamagnetic. ✓ 1

(ix) CO is stronger ligand than Cl^{-1}. ✓ 1

(x) The colour produced in Victor Meyer test for primary alcohol is deep blue. ✗ 1

Multiple choice questions.

(xi) The units of first order reaction : 1

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

(xii) 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
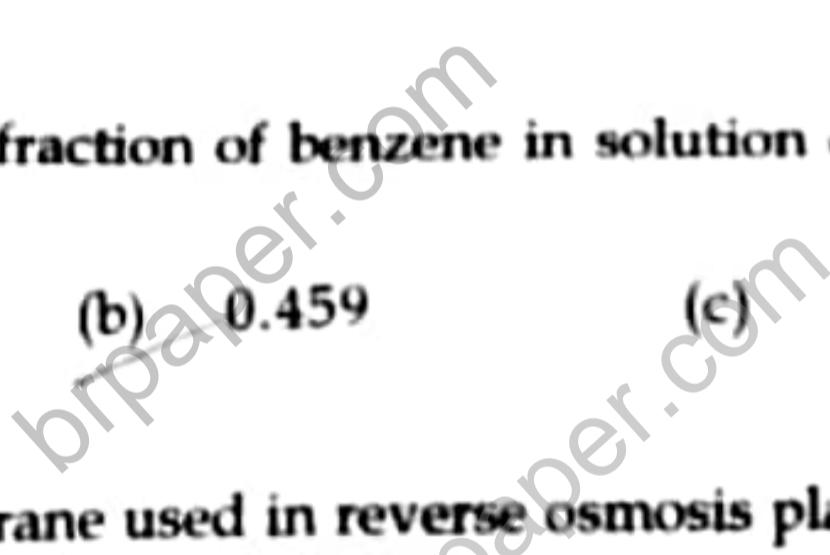
(xiii) The porous membrane used in reverse osmosis plant is made up by : 1

(a) Cellulose acetone (b) Potassium nitrate

(c) Mercuric iodide (d) Starch
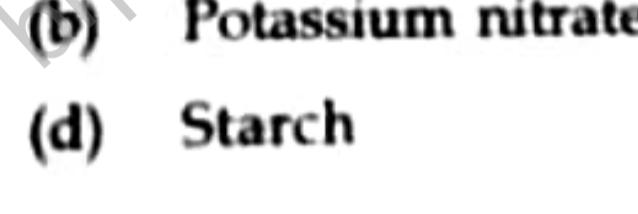
(xiv) The units of ebulloscopic constant is : 1

(a) K kg mol^{-1} (b) mol kg K^{-1}

(c) kg $mol^{-1}K^{-1}$ (d) K mol kg^{-1}

(xv) Galvanisation is applying a coating of : 1

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

(xvi) Benzioc Acid reacts with $LiAlH_4$ to give : 1

(a) Ethylene (b) Methyl Benzene

(c) Phenol (d) Benzyl Alcohol
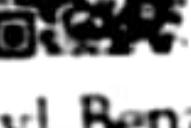
(xvii) Vinegar is dilute aqeous solution or .

(a) Ethanoic acid.

(b) Benzoic acid.

(c) Citric acid.

(d) Oxalic acid.

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

(a) $+3$

(b) $+2$

(c) $+4$

(d) -3

1

(xix) What is DDT among the following :

(a) Fertilizer.

(b) Biodegradable pollutant.

(c) Non-Biodegradable pollutant.

(d) Green House gas.

1

(xx) In the following, strongest Acid is :

(a) CH_3CH_2COOH

(b) CH_3COOH

(c) C_6H_5COOH

(d) $C_6H_5CH_2COOH$

Two Mark Questions

2. How many Coulombs of electricity are required for complete oxidation of 90 gm of H_2O ? 2

3. Give two differences between order of reaction and molecularity of reaction. 2

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

OR

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

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

6. Write two differences between double salt and co-ordination compounds. 2

7. Define monodentate ligands and give example. 2

8. 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

9. Describe Rosenmund reduction. 2

<div align="center">**OR**</div>

Lower carbocyclic acids are highly soluble in water. Explain. 2

10. How will you obtain chlorobenzene from aniline ? 2

11. Explain why methylamine is a stronger base than Ammonia ? 2

12. Give two differences between DNA and RNA. 2

13. Give two differences between ideal and non-ideal solution. 2

14. Calculate the molal elevation constant of water, it being given that 0.1 molal aqueous solution of a substance boils at 100.052°C. 2

<div align="center">**OR**</div>

18 gm of glucose ($C_6H_{12}O_6$) 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 0.52K kg mol^{-1}. 2

15. Give two differences between Galvanic Cell and Electrolytic cell. 2

Three mark Questions.

16. Why is aniline less basic than ethylamine ? 3

17. Calculate the molar conductance Λ_m° for $CaCl_2$, given that $\lambda(Ca^{+2}) = 119.5$ S cm^2 mol^{-1}, $\lambda(Cl^-) = 76.3$ S cm^2 mol^{-1}. 3

<div align="center">**OR**</div>

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

Fe(s) $|Fe^{2+}(0.001M)$ $\|H^+(1M)$ $H_2(1atm)|Pt$.

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

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

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

<div align="center">**OR**</div>

Explain Reimer Tiemann reaction of Phenols. 3

5 marks Answer type questions.

20. Write the following :
   (a)   Give three differences between Lanthanoids and Actinoids.

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

                              OR   2+3=5

   (a)   Transition metals form alloys with other metals. Explain.

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

                                                    1+1+1+1+1=5

21. Write the reaction :

   (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.

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