BAS 3103

S.No. : 706

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 39903 Roll No. 1 2 2 0 4 3 2 6 2 5

B. Tech. Examination 2022-23

(Odd Semester)

CHEMISTRY

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

   (a) Explain magnetic behaviour of CN molecule.

   (b) Why properties of nanomaterials are different?

   (c) Define asymmetric carbon atom.

   (d) The use of solar power is covered under which green chemistry principle.

   (e) What do you mean by normality?

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(f) How many NMR signals are observed in the spectrum of toluene?

(g) What are the monomers of BUNA-S?

(h) Give an example of biodegradable polymer.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

(a) Draw the molecular orbital diagrams of O_2, O_2^+, O_2^-. Arrange them in increasing order of stability.

(b) What is Green Chemistry? "Green chemistry is sustainable chemistry". Explain with examples.

(c) (i) Calculate temporary and permanent hardness of water sample containing $Mg(HCO_3)_2 = 16.8$ mg/L, $MgCl_2 = 19.0$ mg/L, $MgSO_4 = 24.0$ mg/L, $CaCl_2 = 22.2$ mg/L.

(ii) Write short notes on any two of the following :

(i) Redox titration

(ii) Indicators

(iii) End point

(d) (i) Classify the polymers on teh basis of stereo-chemistry

(ii) Explain vulcanization of rubber.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each question. $5 \times 8 = 40$

3. (a) (i) Draw the energy level diagram of NO molecule.

(ii) Derive the rate equation for a second order reaction when the concentration of reactants are same.

(b) Write Nernst equation for single electrode potential and explain the terms involved in it?

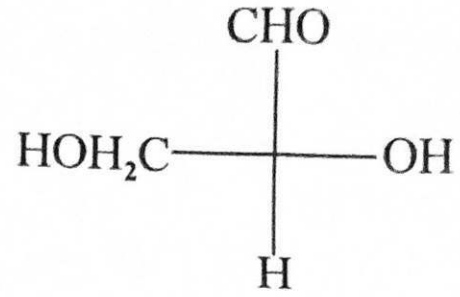
(c) (i) Discuss about preparation and applications of fullerenes.

(ii) Write about liquid crystals and their uses.

4. (a) (i) Differentiate between enantiomers and diastereomers.

(ii) Assign R/S to the following :

(1)



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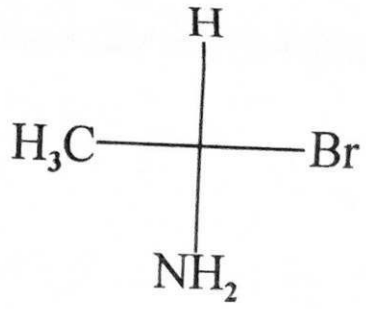

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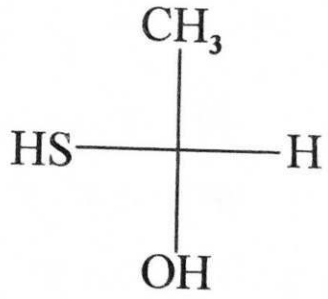
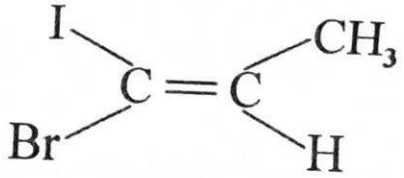


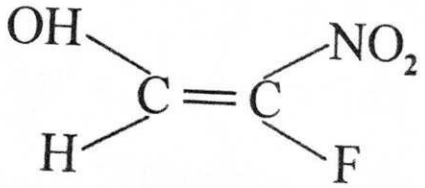
(b) (i) Discuss about various conformations of n-butane.

(ii) Assign E/Z to the following :

(1)



(2)



(c) What is optical isomerism? Give the stereoisomers of tartaric acid. How do you account for lack of optical activity in racemic and meso forms?

5. (a) (i) Explain the terms shielding, deshielding in NMR spectrum briefly.

(ii) What is water quality monitoring? Differentiate between IS 14543 and IS 10500.

(b) (i) Write short notes on types of electronic transition in uv spectroscopy.

(ii) How many NMR signals do you expect from the following compounds :

(1) $CH_3 - \overset{\overset{O}{\|}}{C} - CH_3$

(2) $CH_3 CH_2 OH$

(c) Write short notes on the following :

(i) Tests for water quality determination

(ii) Nanomaterials and it uses

6. (a) How do you prepare the following polymers :

(i) Nylon 6, 6

(ii) Butyl rubber

(iii) BUNA-N

(iv) Neoprene

(v) Dacron

(b) Write about preparation, properties and applications of biodegradable polymers with examples.

(c) (i) Differentiate between thermoplastic and thermosetting polymers.

(ii) Explain copolymerization giving suitable examples.

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