S.No. : 140

BAS 3203

No. of Printed Pages : 06

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

PAPER ID : 39908 Roll No. | 1 | 2 | 1 | 0 | 4 | 3 | 2 | 0 | 8 | 2 |

B. Tech. Examination 2021-22

(Even Semester)

CHEMISTRY

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

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : 8×1=8

   (a) Explain why does Be_2 molecule not exist?

   (b) Give the values of all four quantum number for $4S^1$.

   (c) What is a racemic mixture?

   (d) Which conformation of n-butane is most stable?

   (e) Write the constituents responsible for permanent hardness of water.

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6. (a) Classify the polymers on the basis of mode of synthesis and origin.

(b) How do you prepare the following polymers :

(i) Nylon-6, 6

(ii) Dacron

(iii) BUNA-S

(iv) Teflon

(v) Butyl rubber

(c) Write short notes on the following :

(i) Conducting polymers

(ii) Thermoplastic and thermosetting polymers

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(f) Which IS refers to packaged drinking water?

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

(h) What are biodegradable polymers?

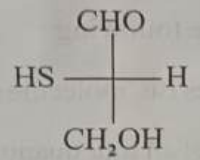
SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Write down the postulates of molecular orbital theory. Draw the molecular orbital diagram of O_2 and HF. Write their bond orders and magnetic behaviour.

(b) Assign R/S and E/Z configuration to the following :

(i)



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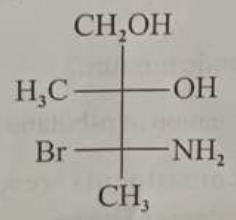

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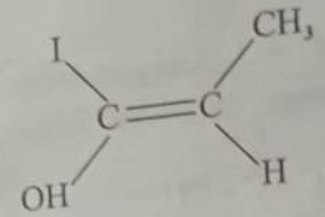

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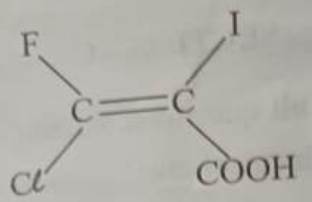

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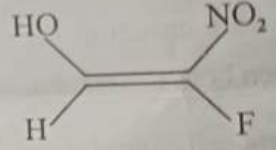
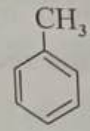


(c) (i) Explain vulcanization of rubber.

(ii) Classify the polymers on the basis of tacticity.

(d) What are equivalent and non-equivalent protons? Predict the number of signals in the following compounds :

(i)



(ii) $CH_3-O-CH_2-CH_3$

(iii) $H_3C-\overset{\overset{O}{\|}}{C}-CH_3$

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 5×8=40

3. (a) What is meant by molecularity of a reaction? Derive the rate equation for a second order reaction when both the reactants are same.

(b) (i) Thje unit cell of an element of atomic mass 96 and density 10.3 g cm^{-3} is a cube with edge length of 3/4 pm. Find the structure of the crystal lattice, simple cubic, FCC or BCC. (Avogadro's Number = 6.023×10^{23} atoms $mole^{-1}$).

(ii) Derive half life period for first order reaction. It depends on the initial concentration of the rectant or not? Explain.

(c) Explain stoichiometric defect, with the help of diagram differentiate between Schottkey and Frenkel defect.

4. (a) Draw the various conformations of n-butane. Write their order of stability using energy profile diagram.

(b) What is optical activity? Give the stereoisomers of tartoric acid.

(c) Biopolymers exemplify which green chemistry principle? Give the number and name with discussion.

5. (a) Explain the following :

(i) Types of electronic transitions in UV spectroscopy

(ii) Indicators and end point

(b) Explain zeolite method for water softening. How is zeolite regenerated?

(c) Write short notes on the following :

(i) Shielding and deshielding

(ii) Auxochrome and bathochromic shift