

S.No. : 171

BAS 203

No. of Printed Pages : 07

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

**PAPER ID : 9908**

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## B. Tech. Examination 2018-19

(Even Semester)

### ENGINEERING CHEMISTRY

*Time : Three Hours]*

*[Maximum Marks : 100*

**Note :-** Attempt all questions.

#### SECTION - A

1. Fill in the blanks of the following :  $2 \times 10 = 20$

- C60 fullerene has ..... hexagon and ..... pentagon.
- In a face centred cubic cell, an atom at the face centre is shared by ..... unit cell.
- Metals are good conductor of electricity because ..... electrons.
- Vulcanization is a process of heating. natural rubber with .....

*[ P. T. O.*

- (e) Enantiomers are .....
- (f) Corrosion is a process of .....
- (g) The units of hardness are .....
- (h) The degree of freedom of a triple point is .....
- (i) A good fuel should possess .....
- (j) The standard reference used in NMR spectroscopy is .....

### SECTION – B

2. Attempt any three parts of the following :  $3 \times 10 = 30$
- (a) (i) Explain the formation of HF molecule on the basis of MOT.
- (ii) Give the structure of graphite and its conducting properties.
- (b) (i) Derive second order reaction when the concentration of reactants are same.
- (ii) Describe Nernst's equation for simple electrode potential and explain the terms involved in it.

- (c) (i) Write the mechanism of Aldol condensation.
- (ii) Discuss conformation in n-butane.
- (d) (i) Define thermoplastic and thermosetting polymers.
- (ii) Write the short notes of the following :
- (1) BUNA-S
- (2) BUNA-N
- (e) (i) Discuss the possible electronic transition in UV region.
- (ii) Write a note on biomass and biogas.

### SECTION – C

**Note :-** All questions of this section are compulsory.  
 $10 \times 5 = 50$

3. Attempt any one parts of the following :
- (a) Describe Bragg's equation for diffraction of X-rays by crystal. At what angle would first order diffraction from planes of KCl be observed using X-ray of wavelength of 154 pm and dimension of unit cell is 315 PM.

*/P. T. O.*

(b) (i) Write short note on liquid crystals and its application.

(ii) What is Hydrogen Bond? How does an intermolecular hydrogen bond differ from intramolecular hydrogen bond?

4. Attempt any one parts of the following :

(a) Explain the term component, phase and degree of freedom. State the phase rule and discuss its application to the system of water vapour, liquid water and ice.

(b) (i) What is Arrhenius equation of reaction rate? The rate of reaction triples when the temperature changes from 20° to 50°C. Calculate the energy of activation (R = 8.314 J/K/m).

(ii) What are Fuel Cells? Describe H<sub>2</sub> - O<sub>2</sub> fuel cell.

5. Attempt any one parts of the following :

(a) (i) Discuss the mechanism and stereo-chemistry of SN<sup>1</sup> and SN<sup>2</sup> reaction.

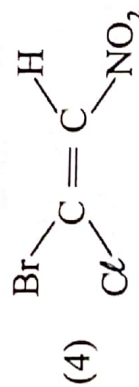
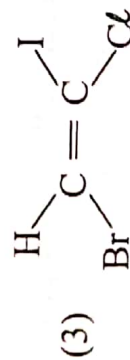
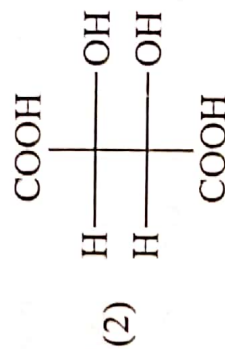
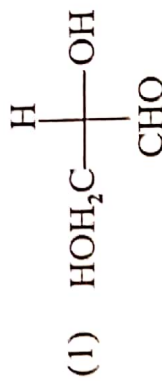
(ii) Write short notes on the following :

(1) Antibiotics

(2) Carbocations

(b) (i) What is Optical Activity? How it is measured? Give the stereo isomers of tartaric acid.

(ii) Assign R-S and Z-E nomenclature :



6. Attempt any one parts of the following :

(a) Write the chemical structure and application of the following polymers :

(i) Nylon-6

(ii) Nylon-6, 6

(iii) Bakelite

(iv) Terelene

(v) PVC

(b) (i) Explain briefly conducting polymer and its application.

(ii) Write short notes on the following :

(1) Biodegradable polymer

(2) Thin layer chromatography

7. Attempt any one parts of the following :

(a) (i) Describe the zeolite process for softening the hard water.

(ii) What is meant by calorific value of a sample of coal? Distinguish between gross and net calorific value.

(b) (i) Write brief notes on the following :

(1) Chemical shift

(2) Shielding and deshielding of protons

(ii) Write short notes on the following :

(1) Finger print region

(2) Chromophores

(3) Bathochromic shift

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