Roll No. .....

TCH–101

B. TECH. (FIRST SEMESTER)
END SEMESTER EXAMINATION, 2018
(ALL BRANCHES)
ENGINEERING CHEMISTRY

Time : Three Hours

Maximum Marks : 100

Note : (i) This question paper contains two Sections.

(ii) Both Sections are compulsory.

Section—A

1. Fill in the blanks : (1×5=5 Marks)

   (a) Anionic addition polymerization is initiated with the help of ..... .

   (b) .....and ..... are the examples of stereoregular polymers.

   (c) The chemical composition of rust is ..... .

   (d) Free radicals are ..... in nature due to the presence of unpaired electron.

   (e) Coal gas and Charcoal is an example of ..... fuels.

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2. Attempt any *five* parts out of seven : (3×5=15 Marks)

(a) Why is water soften by zeolite process unfit for use in boilers ?

(b) Rusting of iron is quicker in saline water then in ordinary water. Give reasons.

(c) Differentiate between nylon 6 and nylon 6, 6 polymers.

(d) Differentiate between Galvanic cell and Electrolytic cell.

(e) Explain the shape of XeF_4 on the basis of VSEPR theory.

(f) Prove that He_2 molecule does not exist with the help of MOT.

(g) Write a short note GCV and NCV.

Section—B

3. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Explain, why N_2 has greater dissociation energy than N_2^+ where as O_2 has less dissociation energy than O_2^+.

(b) Describe conducting polymers and their types.

(c) Give the classification of polymers on the basis of monomer units.

4. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Compare and contrast the salient features of Zeolite process and lime soda process, used in water treatment.

(b) What are the characteristics of drinking water ?

(c) An exhausted zeolite softner was generated by passing 150 litres of NaCl, having a strength of 150 g/l of NaCl. How many litres of hard sample, having hardness of 600 ppm, can be soften, by using this softener ?

5. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) What are Chemical fuels ? How they classified ? Explain with the help of example.

(b) What is electrochemical series ? Discuss its important applications.

(c) Calculate the e. m. f. of the following cell :

Zn/Zn^{+2} (0.001 M)/ Ag^{+1} (0.1 M)/Ag

The standard potential of Ag/Ag^+ half cell is + 0.80 V and Zn/Zn^{+2} is – 0.76 V.

6. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)

(a) Explain nucleophilic substitution reactions and their types. Describe the mechanism of any *one* nucleophilic substitution reaction.

(b) What are drugs ? Give the preparation and uses of any *two* drugs.

(c) Write short notes on the following :

(i) Electromagnetic Spectrum

(ii) Finger print region in IR Spectroscopy

(iii) Chromophore and Auxochrome in UV Spectroscopy

(iv) NMR Spectroscopy