

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.



(2)

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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  $\text{XeF}_4$  on the basis of VSEPR theory.
- (f) Prove that  $\text{He}_2$  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  $\text{N}_2$  has greater dissociation energy than  $\text{N}_2^+$  where as  $\text{O}_2$  has less dissociation energy than  $\text{O}_2^+$ .
- (b) Describe conducting polymers and their types.
- (c) Give the classification of polymers on the basis of monomer units.

(3)

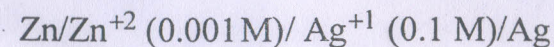
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4. Attempt any *two* parts of choice from (a), (b) and (c). (10×2=20 Marks)

- (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  $\text{NaCl}$ , having a strength of 150 g/l of  $\text{NaCl}$ . 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 :



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



(4)

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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

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