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(Following Paper ID and Roll No. to be filled in your Answer Books)	
Paper ID : 199203	Roll No.

B.TECH.

Theory Examination (Semester-II) 2015-16

ENGINEERING CHEMISTRY

Time : 3 Hours *Max. Mar : 100*

Section-A

Q.1 Attempt all parts. All parts carry equal marks. (2×10=20)

a. On the basis of MOT, prove that the molecule of oxygen is paramagnetic in nature.

b. Describe the isomerism exhibited by maleic and fumaric acids.

c. What is chemical shift? Explain.

d. Define the terms chromosphere and auxochrome in UV shectroscopy.

e. What is inductive effect? Give any two examples where this effect is operative.

f. Explain why benzyl carbonium ion is more stable than ethyl carbonium ion is more stable than ethyl carbonium ion.

g. Define reverse ormosis and calgon conditioning.

h. What are disadvantages of scale formation?

i. How will you synthesise or/on from acetylene?

j. Differentiate between addition holymerisation and condensation holymerisation with suitable examples.

Section-B

2. Attempt any five parts from this section. (10×5=50)

a. With the help of molecular orbital diagram, calculate the bond order of the following:-

He^{2+}, O_2^{2-}, NO, HF and N_2^{2-}

b. Discuss in detail the case of an organic compound with two chiral centres.

c. What is Beer Lambert law in UV-Vis-abrorption shectroscopy? A compound having concentration 10^{-3} gll resulted abserbance value 0.20 at the λmax 510 nm using 1.0 cm. cell. Calculate its abrorhtivity and molar abserptivity values. Molecular weight of compound is 400/200.

d. Give the mechanism of SN^1 and SN^2 organic reaction.

e. Describe ion-exchange process of softening of water.

f. Write note no:-

(i) Reverse ormosis

(ii) Boiler corrosion

g. Describe the process of galvanization of iron. How does it prevent the corrosion of iron?

h. What is ziegler-Natta catalyst-? What is its significance in polymerization.

Section-C

Attempt any two questions from this section. (15×2=30)

Q.3 (a) What are carrosion inhibitar? Explain with examples how anodic and cathodic inhibitar provide protection against carrosion.

(b) Why is it convenient to express hardness of water in terms of $CaCO_3$ at the international level? Write other units also.

Q.4 (a) Differentiate between

(i) Enantiomers and diastereomers

(ii) Recemic mixture and Merocompounds

(b) Write the preharation properties and uses of:-

(i) Silicone rubber

(ii) PMMA

(iii) Bakelite

Q.5 (a) Discuss the principle and application of NMR spectroscopy in structure determination of organic compounds.

(b) Derive the rate expression for second order reaction, when the rectants are different.