

Total No. of Questions : 8]

SEAT No. :

P1959

[Total No. of Pages : 3

**F.E. (Semester - I & II)**  
**ENGINEERING CHEMISTRY**  
**(2012 Pattern)**

*Time :2 Hours]*

*[Max. Marks :50*

*Instructions to the students:*

- 1) Answer Q.1 or Q.2, Q.3 or Q.4 or Q.5 or Q.6 and Q.7 or Q.8.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right side indicate full marks.*
- 4) Use of logarithmic table or electronic pocket Calculator is allowed.*
- 5) Assume Suitable data if necessary.*

- Q1)* a) Describe Ion exchange method for softening of hard water. [6]
- b) What is reference electrode? Draw neat labeled diagram of Glass electrode and give its representation. [3]
- c) Explain conductometric titration curve for reaction between weak acid and strong base. [3]

**OR**

- Q2)* a) Explain different types of electronic transitions occurring in organic molecules on absorption of UV-visible radiations. [6]
- b) Define caustic embrittlement. Give causes and prevention of caustic embrittlement in boiler. [3]
- c) A water sample is not alkaline to phenolphthalein. However 100 ml of water sample on titration with N/50 HCl required 16.9 ml of acid to get methyl orange end point. Identify the type and determine the extent of alkalinity. [3]

*P.T.O.*

- Q3)** a) Define addition polymerization. Explain free radical reaction mechanism with suitable example. [6]
- b) What is power alcohol? Give its preparation with reactions and any two disadvantages. [3]
- c) A coal sample contains C: 80%, H: 10%, S: 2.5%, N:4% and remaining is ash. Calculate the theoretical quantity of oxygen and air required for complete combustion of 1 Kg of given coal sample. [3]

**OR**

- Q4)** a) What is proximate analysis? Explain the procedure for determination of each constituent with its formula. [6]
- b) Distinguish between LDPE and HDPE (any four Points). [3]
- c) Give preparation reaction, properties and uses of SBR. [3]
- Q5)** a) Explain manufacturing of hydrogen gas by steam reforming of
- i) methane and ii) coke. [5]
- b) Explain the structural features of fullerene with diagram and give its applications. [4]
- c) Explain the isotopes of carbon with their applications. [4]

**OR**

- Q6)** a) Explain structural features and applications of diamond and graphite. [5]
- b) Explain difficulties in storage and transportation of hydrogen. [4]
- c) What are different types of hydrides? Give preparation reaction of germane, silane and lithium hydride. [4]

- Q7)** a) What is Pilling-Bedworth ratio? Give four types of oxide films formed on surface of metal with suitable example. [5]
- b) Explain galvanization with neat labeled diagram to protect Iron from corrosion. [4]
- c) What is the principle of Cathodic protection? Explain it with any one method. [4]

**OR**

- Q8)** a) Explain wet corrosion with  $H_2$  evolution and  $O_2$  absorption mechanism. [5]
- b) Distinguish between anodic and cathodic coatings. [4]
- c) Discuss factors affecting rate of corrosion, two each, for nature of metal and nature of environment. [4]

