

Seat  
No.

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AOI1303

## Engineering Chemistry - I (101102)

P. Pages : 2

Time : Three Hours

Max. Marks : 80

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** sub questions from each unit.
5. Assume suitable data if necessary.
6. Figures to the right indicate full marks.
7. Use of logarithmic table, non - programmable calculator is permitted.

### UNIT - I

1. a) Calculate the quantity of lime and soda required for softening 50,000 liters of water containing the following salts per litre;  $\text{Ca}(\text{HCO}_3)_2 = 8.1 \text{ mg}$ ,  $\text{Mg}(\text{HCO}_3)_2 = 7.5 \text{ mg}$ ,  $\text{CaSO}_4 = 13.6 \text{ mg}$ ,  $\text{MgSO}_4 = 12 \text{ mg}$ ,  $\text{MgCl}_2 = 2.0 \text{ mg}$  and  $\text{NaCl} = 4.7 \text{ mg}$ . 8  
b) i) Explain zeolite process with the help of reactions and well labelled diagram. 4  
ii) 100ml of a water sample required 30ml of N/50  $\text{H}_2\text{SO}_4$  for neutralization to phenolphalein end point. After this, methyl orange indicator was added to this and further acid required was again 30ml. Calculate the alkalinity of water as  $\text{CaCO}_3$  in ppm. 4  
c) i) Explain priming and foaming. 4  
ii) Differentiate between scales and sludges. 4

### UNIT - II

2. a) Explain the preparation, properties and use of polycarbonate. 8  
b) i) Explain the mechanism of addition polymerization by any one process. 4  
ii) Gives the uses of PVC and polystyrene. 4

- c) i) Classify the polymers on the basis of their chemical composition. 4
- ii) Explain the preparation and uses of Butyl rubber. 4

### UNIT - III

- 3. a) Explain the functions of ingredients of portland cement. 8
- b) i) Explain the manufacture of portland cement by dry process with the help of flow sheet diagram. 4
- ii) Describe the chemical constitution of portland cement. 4
- c) i) Describe the process of heat of hydration. 4
- ii) Explain the term setting and hardening of cement. 4

### UNIT - IV

- 4. a) Explain mechanical properties of ceramics. 8
- b) i) Explain the basic raw materials used for the preparation of ceramics. 4
- ii) Write the applications of ceramics. 4
- c) i) Explain the mechanism of drying in ceramic waves. 4
- ii) What will be the effect of heat on shrinkage and porosity of ceramic waves. 4

### UNIT - V

- 5. a) Explain the composition, properties and uses of steel. 8
- b) i) Explain electrodeposition method of preparation of alloy. 4
- ii) Give the composition properties and uses of aluminium bronze. 4
- c) i) Explain the necessity of making alloy. 4
- ii) Give the preparation, properties and uses of Duralumin. 4

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