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Total No. of Questions : 6]

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**EW-68**

**B.Tech. I<sup>st</sup> Semester (CSE, IT & Electronics)**

**Examination, 2021-22**

**Engineering Chemistry**

**Paper - BE-102**

**Time : 3 Hours]**

**[Maximum Marks : 60**

**Note :-** Attempt all questions. Questions shall be attempted section wise at one place.

**1. Write short answer of the following :**

- (a) What is the purpose of coagulation in water treatment ?
- (b) Define HCV.
- (c) What is meant by passivity of metals ?

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- (d) Write the chemical structure of Bakelite.
  - (e) Mechanical strength decreases with increase in porosity of a refractory.
2. (a) Distinguish between scale and sludge. Is it hardness being these boiler problems? If yes, then explain.
- (b) What do you know about slow sand filtration? Discuss salient features of the process. What are the limitations of this process?

**OR**

- (a) Calculate total hardness of water sample in  $\text{CaCO}_3$  equivalent:
- $\text{MgCl}_2 = 27.5 \text{ ppm}$ ,  $\text{Mg}(\text{HCO}_3)_2 = 124 \text{ ppm}$ ,  $\text{CO}_2 = 44 \text{ ppm}$ ,  
and  $\text{SiO}_2 = 57 \text{ ppm}$
- (b) How the hardness of water can be removed by ion exchange process? What are the limitations?
3. (a) How a lubricant works? Clearly mention the mechanism of lubrication which reduction of shearing strength of material.
- (b) Explain the following properties of Lubricants (any two)

- (i) Flash and fire point
- (ii) Cloud and pour point
- (iii) Neutralization Number

**OR**

- (a) What is the importance of Carbonization in Coal manufacturing? Comments on low temperature carbonization
  - (b) Define proximate analysis of coal. How fixed carbon can be found out?
4. (a) What are co-polymers? Explain with PMMA
- (b) Draw a neat sketch for rotary kiln mentioning various temperature zone of transformation of raw material.

**OR**

- (a) What is refractoriness? What is the significance of Thermal spalling porosity and mechanical strength of a refractory?
  - (b) What are the various components of paints? What is the function of each components?
5. (a) What are the anodic and cathodic reactions of corrosion? Discuss.

- (b) What is Nernst Equation Discuss with any one the applications ?

**OR**

- (a) What are the thermodynamic functions ? Comments on Free Energy.
- (b) What are the various factors which affect atmospheric corrosion ?
6. (a) Write a note on Photochemical Smog.
- (b) What is the principle of UV Spectroscopy ? What are the important application in analytical chemistry ?

**OR**

- (a) What is the major cause of radioactive pollution ? Summarise as an effective note.
- (b) Write short note on Oxygen Demand.

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