

I B.Tech. I Semester Supplementary Examinations, January - 2020**ENGINEERING CHEMISTRY**

(Com. to CE,ME,PE,PChem E, Chem E, Aero E, Min E, Auto E, Metal E, BT)

Time: 3 hours

Max. Marks: 70

Note: 1. Question paper consists of two parts (**Part-A** and **Part-B**)

2. Answering the question in **Part-A** is Compulsory

3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Explain the role of fillers and colouring agents in compounding of rubber. (2M)
- b) What are antiknocking agents? Give examples. (2M)
- c) Explain stable and unstable metal oxide layers? Give examples. (2M)
- d) What are supercritical fluids? Give examples. (2M)
- e) What is the buffer used in complexometric titration of hardness of water. Give reason why is it used? (2M)
- f) Define refractory. (2M)
- g) Define fire point. (2M)

**PART -B**

2. a) Write notes on composites and fiber reinforced plastics. (7M)
- b) Explain the applications of plastics and elastomers. (7M)
3. a) Discuss how calorific value can be determined by using bomb calorimeter. (7M)
- b) Define primary and secondary fuels. Give examples. Calculate the HCV and LCV of a fuel containing C = 67%, H = 12%, O = 8%, N = 6%, S = 3% and remaining ash. (7M)
4. a) Discuss Ni-metal hydride cells and calomel electrode. (7M)
- b) Explain the different types of corrosion. (7M)
5. a) What are nanomaterials? What are one,two, three dimensional nanomaterials? Give examples. Explain chemical reduction method. (7M)
- b) Discuss the thermotropic liquid crystals. (7M)
6. a) Discuss permutit process for softening of hard water. (7M)
- b) Explain how caustic embrittlement and scales are formed. Discuss the remedies to remove these boiler troubles. (7M)
7. a) Discuss the various steps involved in manufacturing process of Portland cement. (7M)
- b) Explain (i) viscosity of lubricant (ii) thermal spalling of refractories (7M)