



**I B. Tech II Semester Regular/Supplementary Examinations, April/May - 2019****APPLIED CHEMISTRY**

(Com. to CSE, IT, EIE, ECE, E Com E)

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**

**PART -A**

1. a) Write the applications of polyethylene. (2M)
- b) What are primary and secondary explosives? Give examples. (2M)
- c) Write the reduction reactions taking place at cathode in Ni-Cd and zinc air cells. (2M)
- d) What are superconductors? (2M)
- e) Explain the applications of junction transistor. (2M)
- f) Explain the role of ammonia in ocean thermal conversion. (2M)
- g) Explain why small amount of ethylene dibromide is added to petrol. (2M)

**PART -B**

2. a) Explain compounding of plastics. (7M)
- b) Discuss the preparation, properties and uses of Bakelite. (7M)
3. a) Write notes on power alcohol. (6M)
- b) What are the drawbacks of fixed bed catalytic cracking? How can it be better modified? (8M)
4. a) Discuss tinning and electroless plating with examples. (7M)
- b) What is corrosion? Discuss differential aeration corrosion. (7M)
5. a) Explain the properties of fullerenes. (7M)
- b) Explain the applications of carbon nanotubes. (7M)
6. a) Explain the structures of simple cubic, BCC and FCC. (7M)
- b) Discuss (i) Epitaxy (ii) Czochralski crystal pulling technique. (7M)
7. a) Discuss bio-fuels. Mention their advantages. (7M)
- b) What is thermal and photo-conversion of solar cells? (7M)

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**PART -A**

1. a) What are biodegradable polymers? Give examples. (2M)
- b) What are the various anti-knocking agents added to fuel? (2M)
- c) Explain where corrosion occurs when Zn rod is dipped in NaCl solution. Give reason. (2M)
- d) In sol gel method, what is meant by aerogel and xerogel. (2M)
- e) Mention the applications of Hall's effect. (2M)
- f) Explain thermal conversion of solar energy. (2M)
- g) Why is gross calorific value always higher than net calorific value? (2M)

**PART -B**

2. a) What are natural and synthetic rubbers? Write the drawbacks of natural rubber. (7M)
- b) What are bullet proof plastics? How are they prepared and mention its applications. (7M)
3. a) What are explosives? How are they classified? (7M)
- b) Define cracking. Explain thermal cracking. Mention its drawbacks compared to catalytic cracking. (7M)
4. a) Explain galvanic corrosion by taking example. (7M)
- b) Explain the environmental factors influencing corrosion. (7M)
5. a) Explain the need of green chemistry. (8M)
- b) Explain how BET and TEM methods are used for characterization of nanomaterials. (6M)
6. a) Explain the characteristics and types of electrical insulators. (7M)
- b) Explain p-n junction diode. (7M)
7. a) Explain the working of fuel cell taking H<sub>2</sub>-O<sub>2</sub> as example. (7M)
- b) What is ocean thermal energy? What are its types? Explain hybrid OTEC. (7M)

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**PART -A**

1. a) What is the role of coloring agents in rubber? Give examples. (2M)
- b) Explain what happens when tetraethyl lead is added to petrol. (2M)
- c) Write the difference between electroless and electroplating. (2M)
- d) Define nano materials. (2M)
- e) Explain ferromagnetism with examples. (2M)
- f) What is geothermal energy? (2M)
- g) What is meant by critical micelle concentration in emulsion polymerization? (2M)

**PART -B**

2. a) Explain intrinsically doped conducting polymers. (7M)
- b) Discuss the preparation & properties of BUNA-S and Thiokol. (7M)
3. a) Explain moving bed catalytic cracking for preparation of gasoline. (7M)
- b) Discuss the refining process involved after extraction of petroleum from wells. (7M)
4. a) Explain (i) sacrificial anodic method (ii) Zinc air cells. (7M)
- b) Explain the different methods of application of metals coatings. (7M)
5. a) Explain the principles of green chemistry. (7M)
- b) Describe laser ablation and arc discharge method for preparation of carbon nanotubes. (7M)
6. a) Discuss stoichiometric and controlled valency semiconductors. (7M)
- b) Explain the structure of rock salt. (7M)
7. a) What are fuel cells? Mentions its advantages and applications. (7M)
- b) Write notes on biomass and biofuels. (7M)

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**PART -A**

1. a) Explain why nitrile rubber is less resistant to alkalis than natural rubber. (2M)
- b) In bomb calorimeter, explain the necessity for acid and fuse wire correction. (2M)
- c) Explain why iron corrodes under drops of water. (2M)
- d) What is meant by  $R_4M_4$ ? (2M)
- e) Explain the types of solids. (2M)
- f) Explain phosphoric acid fuel cell. (2M)
- g) What are the advantages of suspension and emulsion polymerization? (2M)

**PART -B**

2. a) Discuss the preparation, properties and uses of Teflon. (6M)
- b) What is meant by compounding? Explain compounding of rubber. (8M)
3. a) Write about octane number, cetane number and anti-knocking agents. (7M)
- b) Explain the general characteristics of solid and liquid fuels. (7M)
4. a) Explain passivity and specific volume ratio and discuss how they influence rate of corrosion. (7M)
- b) Discuss (i) galvanic cell and (ii) Li cells. (7M)
5. a) Explain the thermotropic liquid crystals. Explain its types. (6M)
- b) Explain any one method for preparation of nanomaterials and write their application. (8M)
6. a) Discuss the working of xerox machine in chalcogen semiconductors. (6M)
- b) Explain types of spinels with suitable examples and write about structure of rock salt. (8M)
7. a) Explain tidal power and its applications. (7M)
- b) Explain the drawbacks of ocean thermal energy conversion and geothermal energy. (7M)