

I B. Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018

APPLIED CHEMISTRY

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

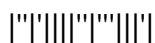
- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**
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PART -A

1. a) What is the role of plasticizers in compounding of plastics? Give examples of plasticizers. (2M)
- b) How is volatile matter determined in a coal sample? (2M)
- c) What is meant by pitting corrosion? (2M)
- d) What is the importance of BET analysis in the study of nanomaterials? (2M)
- e) Explain the types of solids. (2M)
- f) What are the disadvantages of tidal power energy? (2M)
- g) Explain the applications of fullerenes in medicine. (2M)

PART -B

2. a) Discuss the mechanical properties of polymers. (7M)
- b) Explain fiber reinforced plastics. (7M)
3. a) What is synthetic petrol? Explain Bergius process for preparation of synthetic petrol. (7M)
- b) Explain the classification of explosives. (7M)
4. a) Write notes on design and material selection of metals to prevent corrosion. (7M)
- b) Describe hydrogen and calomel electrodes with a neat sketch. (7M)
5. a) Explain any two methods of green synthesis. (7M)
- b) Differentiate Type-I and Type-II superconductors. (7M)
6. a) Discuss about (7M)
 - (i) Stoichiometric semiconductors
 - (ii) Chalcogen photoconductors
- b) Discuss the close packing of atoms and ions in BCC and FCC. (7M)
7. a) What is Ocean thermal energy? Explain open ocean thermal energy conversion with a neat sketch. (7M)
- b) Explain about (7M)
 - (i) methanol-oxygen fuel cells
 - (ii) biomass



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PART -A

1. a) Explain why thermosetting polymers are not suitable for injection moulding technique. (2M)
- b) Calculate the weight of air required for the combustion of 5 kg of carbon. (2M)
- c) What is meant by passivity? (2M)
- d) What are the properties of superconductors? (2M)
- e) What is inverse spinel? Give examples. (2M)
- f) What is meant by hybrid OTEC? (2M)
- g) What is cracking? What are its types? (2M)

PART -B

2. a) Explain stereo regular polymers. (7M)
- b) What are the disadvantages of natural rubber? How can it be improved? (7M)
3. a) Explain proximate analysis of coal and its significance. (7M)
- b) Explain about (i) Power alcohol (7M)
(ii) CNG.
4. a) Explain about (i) Dry cell (7M)
(ii) Ni-Cd batteries.
- b) Discuss sacrificial anodic and impressed current cathodic protection. (7M)
5. a) Explain sol-gel method of preparation and its limitations. (7M)
- b) Discuss the need of green chemistry. (7M)
6. a) Explain the electrical properties of insulators. (7M)
- b) Explain the preparation of semiconductors by zone refining and Czochralski crystal pulling method. (7M)
7. a) Explain the setup a hydropower plant with a neat diagram. (7M)
- b) Discuss (i) biomass (ii) phosphoric acid fuel cells. (7M)



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PART -A

1. a) How are polycarbonates prepared? (2M)
- b) How is sulphur determined in a coal sample? (2M)
- c) Write the anodic and cathodic reactions of zinc-air batteries. (2M)
- d) Why are cholesteric liquid crystals used in thermometers? (2M)
- e) What is meant by ferromagnetism? (2M)
- f) What is ocean thermal energy? What are its types? (2M)
- g) What are the advantages of liquid fuels over solid fuels? (2M)

PART -B

2. a) Discuss compounding of rubber. (7M)
- b) Discuss biodegradable plastics and its limitations. (7M)
3. a) Explain fixed bed catalytic cracking of a fuel. How is it better than thermal cracking? (7M)
- b) Discuss octane and cetane number. (7M)
4. a) Differentiate electrochemical series and galvanic series. (7M)
- b) Discuss concentration cells. (7M)
5. a) Explain about (7M)
 - (i) Chemical reduction method
 - (ii) Chemical vapour deposition method
- b) Explain the properties of fullerenes. (7M)
6. a) Describe p-n junction diode. (7M)
- b) Explain the structure of rock salt. (7M)
7. a) Explain the working of geothermal power plant with a neat diagram. (7M)
- b) Explain (i) molten carbonate fuel cells (ii) conversion of solar energy (7M)



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PART -A

1. a) Explain degree of polymerization. (2M)
- b) Why is knocking occurred in internal combustion engines? (2M)
- c) Why galvanized products are not used for storing food stuffs? (2M)
- d) What is meant by the term R_4M_4 ? (2M)
- e) What is meant by ferrimagnetism. (2M)
- f) What are the advantages of hydropower energy? (2M)
- g) Explain the role of humidity and pH on corrosion. (2M)

PART -B

2. a) Discuss the applications of polycarbonates and BUNA-N. (7M)
- b) Discuss anionic mechanism of addition polymerization. (7M)
3. a) Explain how nitrogen, carbon and hydrogen are estimated in a coal. (7M)
- b) Explain Fischer-Tropsch method of synthesis of petrol. (7M)
4. a) Discuss the various methods of cleaning the surface of metal before coating. (7M)
- b) Discuss about (7M)
 - (i) Ni-Metal hydride cells
 - (ii) lithium cells
5. a) Explain the thermotropic and lyotropic liquid crystals. (7M)
- b) Explain arc discharge method and laser ablation method for preparation of carbon nanotubes. (7M)
6. a) Discuss Hall effect and its applications. (7M)
- b) Explain about (7M)
 - (i) Epitaxy
 - (ii) Controlled valency semiconductors.
7. a) Explain the design, working and importance of photovoltaic cell. (7M)
- b) Explain the design and working of movement of tides and their effect on sea level. (7M)

