

Code No: R161211

**R16****SET - 1****I B. Tech II Semester Regular/Supplementary Examinations, April/May - 2018****APPLIED CHEMISTRY**

(Com. to CSE, IT, EIE, ECE, ECom 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**
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**PART -A**

1. a) What are conducting polymers? Give examples. (2M)
- b) What is calorific value? Write the formula of HCV. (2M)
- c) What is corrosion? Why metals undergo corrosion? (2M)
- d) Write the advantages of sol-gel method in preparation of nanomaterials. (2M)
- e) What are electrical insulators? Give examples. (2M)
- f) What is meant by biofuel? Give examples. (2M)
- g) Write the differences between electro and electroless plating. (2M)

**PART -B**

2. a) Discuss about physical and mechanical properties of polymers. (7M)
- b) Write the applications of (i) polymers (ii) elastomers (7M)
3. a) Define calorific value. Explain the determination of calorific value of solid fuel by bomb calorimeter with a neat sketch. (7M)
- b) What is cracking? Explain fluid bed catalytic cracking process. (7M)
4. a) Discuss about (i) determination of single electrode potential (ii) standard hydrogen electrode. (7M)
- b) Explain factors influencing the rate of corrosion. (7M)
5. a) Explain preparation of CNT's by any one method and mention its applications. (7M)
- b) Discuss the types and application of liquid crystals. (7M)
6. a) Write notes on p-n junction transistor. (7M)
- b) Discuss the structure of NaCl. (7M)
7. a) Explain the working of wave power station. (7M)
- b) Discuss (i) molten carbonate fuel cell (ii) methanol-oxygen fuel cell. (7M)

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**R16****SET - 2****I B. Tech II Semester Regular/Supplementary Examinations, April/May - 2018****APPLIED CHEMISTRY**

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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) What are stereoregular polymers? (2M)
- b) What is cracking? What mechanism involved in thermal cracking? (2M)
- c) Explain how ratio of anodic and cathodic area affects the rate of corrosion. (2M)
- d) Discuss briefly single walled nanotubes. (2M)
- e) What is meant by inverse spinel? Give example. (2M)
- f) What is fuel cell? Mention any two importance of it. (2M)
- g) What kind of polymer act as conducting polymers? Give example. (2M)

**PART -B**

2. a) What is compounding? Explain compounding of plastics. (7M)
- b) What is fiber reinforced plastics? Discuss about bullet proof plastics. (7M)
3. a) Define HCV and LCV. Calculate the gross and net calorific value of a coal having the following composition: C-82%, H-8%, S-2%, N-2% and remaining ash, Latent heat of steam-587 cal/g. (7M)
- b) Write notes on flue gas analysis by Orsat apparatus. (7M)
4. a) What is electrode potential? Explain the construction and working of Ni-metal hydride cell. (7M)
- b) Explain protection of metal from corrosion by cathodic protection. (7M)
5. a) Explain any two methods of green synthesis. (7M)
- b) Explain (i) preparation of nanomaterial by chemical reduction method (ii) applications of fullerenes. (7M)
6. a) Explain (i) stoichiometric semiconductors (ii) spinels (7M)
- b) Discuss the applications of electrical insulators. (7M)
7. a) Discuss the working of hybrid OTEC and open cycle OTEC. (7M)
- b) Explain photovoltaic cell and its applications. (7M)

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**R16****SET - 3****I B. Tech II Semester Regular/Supplementary Examinations, April/May - 2018****APPLIED CHEMISTRY**

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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 Compulsory3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Write the initiators that are used in free radical, cationic and anionic addition polymerization. (2M)
- b) Discuss about power alcohol. (2M)
- c) How temperature and conducting medium influence the corrosion of metal? (2M)
- d) Discuss about the preparation of catalyst for preparation of CNT's by CVD method. (2M)
- e) Write the difference between ferro and ferri magnetism. (2M)
- f) Write cathodic and anodic reactions of phosphoric acid and fuel cell. (2M)
- g) What are reference electrodes? Give examples. (2M)

**PART -B**

2. a) Write notes on (i) stereoregular polymers (ii) preparation of Bakelite. (7M)
- b) What are the drawbacks of natural rubber? Discuss how to overcome it. (7M)
3. a) Explain proximate analysis of coal and its significance. (7M)
- b) A coal sample gave the following analysis: C-66.2%, H-4.2%, O-6.1%, N-1.4%, S-2.9%, moisture-9.7% and remaining coal. If one Kg of coal is burnt with 25% excess air, determine quantity of products of combustion. (7M)
4. a) Explain electroplating and electroless plating to protect the metal from corrosion. (7M)
- b) Explain construction and working of calomel electrode and mention its applications. (7M)
5. a) What are nanomaterials? Explain preparation of nanomaterials by sol-gel method. (7M)
- b) Write the differences between Type-I and Type -II superconductors and mention its application. (7M)
6. a) Discuss the preparation of semiconductors by (i) distillation (ii) Czochralski pulling method. (7M)
- b) Explain close packing of atoms and ions. (7M)
7. a) Discuss thermal and photoconversion of solar energy. (7M)
- b) Discuss biomass and biofuels. (7M)

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**R16****SET - 4****I B. Tech II Semester Regular/Supplementary Examinations, April/May - 2018****APPLIED CHEMISTRY**

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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) Write any four drawbacks of natural rubber. (2M)
- b) What is knocking? Give any two antiknocking agents. (2M)
- c) Write the differences between electrochemical and electrolytic cell. (2M)
- d) Discuss thermotropic liquid crystals. (2M)
- e) What is inverse spinel? (2M)
- f) What is meant by biomass? Give example. (2M)
- g) Discuss about waterline corrosion. (2M)

**PART -B**

2. a) Discuss about conducting polymers (7M)
- b) What is thermoplastics and thermosetting? Discuss any one method for fabrication of plastics. (7M)
3. a) How liquid fuels are better than solid fuels? Discuss the refining of petroleum. (7M)
- b) Write notes on (i) LPG and CNG (ii) RDX and TNT. (7M)
4. a) What is a battery? Explain construction and working of zinc air cell. (7M)
- b) Explain corrosion of metals by (i) differential aeration (ii) pitting corrosion. (7M)
5. a) What are carbon nanotubes? Mention the types. Explain preparation of CNT's by CVD method. (7M)
- b) Discuss green principles. Mention their importance. (7M)
6. a) Write notes on (i) controlled valency semiconductors (ii) Ferrimagnetism (7M)
- b) Discuss the types of solids. (7M)
7. a) Explain how electricity can be generated from hydro power plant. (7M)
- b) Explain the working and advantages of hydrogen-oxygen fuel cell. (7M)