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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Code No: R161106 **R16** SET - 2

I B. Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018
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Time: 3 hours Max. Marks: 70

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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 (7M)
   (i) Power alcohol
   (ii) CNG.

4. a) Explain about (7M)
   (i) Dry cell
   (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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Code No: R161106 **R16** SET - 3

I B. Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018
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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)	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 (i) Chemical reduction method (ii) Chemical vapour deposition method	(7M)
	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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Code No: R161106 **R16** SET - 4

I B. Tech I Semester Regular/Supplementary Examinations, Oct/Nov - 2018
APPLIED CHEMISTRY
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Time: 3 hours Max. Marks: 70

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

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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)

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