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**

~~~~~~

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)
~~~~~~

Code No: R161211 **R16** SET - 2

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**

~~~~~~

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)
~~~~~~

Code No: R161211 **R16** SET - 3

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**

~~~~~~

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) Czohlaski 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)
~~~~~~

Code No: R161211 **R16** SET - 4

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**

~~~~~~

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)
~~~~~~