Code No: R10104/R10 **Set No. 1**

I B.Tech I Semester Supplementary Examinations, Jan/Feb 2015
ENGINEERING CHEMISTRY-I
(Common to Civil Engineering, Electrical & Electronics Engineering, Mechanical Engineering, Electronics & Communication Engineering, Computer Science & Engineering, Chemical Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Information Technology, Electronics & Computer Engineering, Aeronautical Engineering, Automobile Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) State and explain lechatliers principle.
   (b) Apply Lechatliers principle to the manufacture of NH_3. [8+7]

2. (a) Explain the action of a catalyst in terms of its activation energy.
   (b) Why a rough surface of a catalyst is more effective than a smooth surface? [8+7]

3. Write short notes on the following
   (a) Biosensors
   (b) Ion-selective electrodes
   (c) Basic Principle involved in ^{1}H-NMR Spectroscopy [5+5+5]

4. (a) State and explain the following
   (i) Chalcogen photoconductors
   (ii) Defect semiconductors
   (b) Give an account of chemical properties of liquid crystals [10+5]

5. (a) Write a Short note on thermal power station?
   (b) Explain briefly about the terms involved in the thermal power plant? [7+8]

6. (a) What is concentration cell? Explain with suitable example Derive the expression for emf of concentration cell?
   (b) Write notes on calomel electrode [10+5]

7. Write notes on
   (a) Mass defect and Binding energy.
   (b) Differences between nuclear fission and nuclear fusion.
   (c) Breeder reactor [5+5+5]

8. Discuss the following applications of solar energy
   (a) Solar Cooker
   (b) Space heating and Water heating
   (c) Solar Power Plant [5+5+5]

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Code No: R10104/R10 **Set No. 2**

I B.Tech I Semester Supplementary Examinations, Jan/Feb 2015
ENGINEERING CHEMISTRY-I
(Common to Civil Engineering, Electrical & Electronics Engineering, Mechanical Engineering, Electronics & Communication Engineering, Computer Science & Engineering, Chemical Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Information Technology, Electronics & Computer Engineering, Aeronautical Engineering, Automobile Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the terms solubility product and common ion effect.
   (b) What are the applications of solubility product ? [8+7]
2. (a) What are enzyme Catalyzed reactions? Explain with examples.
   (b) Write a short note on promoters and inhibitors. [8+7]
3. (a) Explain the theory of preparation, manufacturing of electrode and interferences in the determination of Nitrate ion
   (b) What are the engineering applications of sensors and bio sensors? [9+6]
4. (a) What are the chemical materials used to prepare storage devices? Explain the working mechanism of CD
   (b) Explain the role of thermo tropic, lyotropic liquid in engineering applications [10+5]
5. (a) Write short notes on (i) characteristics of a good fuel. (ii) non – conventional energy sources
   (b) Discuss the classification of fuels. What is meant by calorific value of a sample of coal? Distinguish between gross and net calorific value [8+7]
6. (a) What is EMF. Write a note on Redox Reactions.
   (b) What are the differences between oxidation & reduction half reactions? [7+8]
7. (a) Radioactive decay follows first order kinetics. Explain.
   (b) What is half-life period? and decay constant? 90% of S^{31} is decayed in 8.66 seconds. Find the decay constant and half-life period of the radioactive substance. [8+7]
8. Explain the following
   (a) Acid rains
   (b) Depletion of Ozone Layer
   (c) Enhanced green house effect [5+5+5]

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Code No: R10104/R10 **Set No. 3**

I B.Tech I Semester Supplementary Examinations, Jan/Feb 2015
ENGINEERING CHEMISTRY-I
(Common to Civil Engineering, Electrical & Electronics Engineering, Mechanical Engineering, Electronics & Communication Engineering, Computer Science & Engineering, Chemical Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Information Technology, Electronics & Computer Engineering, Aeronautical Engineering, Automobile Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) State and explain Lechatliers principle.
   (b) Apply Lechatliers principle to the manufacture of Sulphuric Acid. [8+7]

2. (a) Define the term viscosity? What are its units?
   (b) Explain the various factors affecting viscosity? [8+7]

3. (a) Write any five important differences between photochemical and thermo chemical reactions?
   (b) Explain Fluorescence and Phosphorescence using Joblonski diagram. [5+10]

4. (a) What is the relation between Superconductivity and Critical temperature
   (b) Briefly describe about CD and Pen drive.
   (c) What are the important physical and chemical properties of liquid crystals? [5+5+5]

5. (a)What are energy sources?
   (b)Write a short note on
   (i) Conventional energy sources
   (ii) Non conventional energy sources [7+8]

6. (a) Write a notes on fuel cell
   (b) Discuss the working principle of primary batteries? [7+8]

7. (a) Energy is released in nuclear fission as well as in nuclear fusion. Explain why?
   (b) How nuclear fuel is enriched in Breeder reactor? [8+7]

8. (a) What is solar energy? How is it harnessed?
   (b) How can solar energy can be converted into electricity? [7+8]

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Code No: R10104/R10 **Set No. 4**

I B.Tech I Semester Supplementary Examinations, Jan/Feb 2015
ENGINEERING CHEMISTRY-I
(Common to Civil Engineering, Electrical & Electronics Engineering, Mechanical Engineering, Electronics & Communication Engineering, Computer Science & Engineering, Chemical Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Information Technology, Electronics & Computer Engineering, Aeronautical Engineering, Automobile Engineering, Mining and Petroliem Technology)

Time: 3 hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) State the law of chemical equilibrium. How can it be derived on thermodynamic considerations?
   (b) What are various types of semi permeable membranes used in reverse osmosis process and what are their limitations? [8+7]

2. (a) What are colloids? How are they classified?
   (b) Write on the important industrial applications of colloids. [8+7]

3. (a) Write any five important differences between photochemical and thermo chemical reactions?
   (b) Explain Fluorescence and Phosphorescence using Joblonski diagram. [5+10]

4. (a) Doping germanium with Aluminum produce p-type semiconductors. Explain?
   (b) What are the engineering applications of Superconductors?
   (c) Explain the working principle of LCD [6+4+5]

5. (a)Explain the following terms?
   (i) Condensor (ii) Cooling towers
   (b) Explain the following terms?
   (i) super heater (ii) Reheater (iii) Air preheater [7+8]

6. (a) Write about Concentration cells.
   (b) What are the differences between oxidation & reduction half reactions? [7+8]

7. Explain the following in nuclear reactors.
   (a) Fuel
   (b) Critical mass
   (c) Control rods
   (d) Protective shield
   (e) Coolants [5+5+5]

8. (a) What is green house effect? Explain.
   (b) How it is useful to mankind? [8+7]

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