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

I B.Tech I Semester Supplementary Examinations, Aug. 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) How is Reverse Osmosis useful for desalination process
   (b) List out the semipermeable membranes used in desalination process. [8+7]
2. (a) What are the characteristics of a catalyst
   (b) Explain why catalyst does not influence the final position of equilibrium. [8+7]
3. (a) What are biosensors? Discuss in detail the applications of biosensors in various fields.
   (b) Discuss ion-selective electrodes in detail and outline the interferences during their working [8+7]
4. (a) How can you differentiate thermo tropic, lyotropic liquid crystals? Explain
   (b) Explain the synthesis of 1:2:3 type super conductor [9+6]
5. (a) How to determine the Calorific value of a solid fuel by using Bomb Calorimeter
   (b) Write the correction required to obtain accurate results in Bomb Calorimeter? [8+7]
6. (a) Explain the working of Calomel electrode?
   (b) Explain the working of Ag / AgCl electrode? [8+7]
7. (a) What is a nuclear reactor? Explain its essential parts.
   (b) Describe its working process. [6+9]
8. (a) Write shortly about solar thermal power plants.
   (b) What is global warming? Discuss its effects and suggest ways to prevent global warming. [7+8]

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

I B.Tech I Semester Supplementary Examinations, Aug. 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 following terms
   i. Enthalpy
   ii. Entropy
   iii. Free energy
   iv. Internal energy
   (b) State and explain Joule Thompson effect. [8+7]

2. (a) Define the following
   (i) Absloute viscosity (ii) Kinematic viscosity.
   (b) Write down important applications of viscosity. [8+7]

3. (a) What are ion-selective electrodes Explain the functioning of these electrodes.
   (b) What is the significance of Joblonski diagram in photochemistry? [9+6]

4. (a) Write an essay on smectic liquid crystals?
   (b) Explain phenomenon of superconductivity. [10+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 the different types of fuel cells?
   (b) Write down the characteristics of fuel cells? [8+7]

7. (a) Where are the atomic power stations in India? Mention them.
   (b) Describe the principle and working process of a nuclear power plant. [3+12]

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, Aug. 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 Lechateliers principle with examples.
   (b) List out the semipermeable membranes used in desalination process. [8+7]

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

3. (a) Differentiate between the Fluorescence and Phosphorescence.
   (b) What are the engineering applications of sensors and bio sensors? [9+6]

4. (a) Explain various doping techniques to prepare semiconductors.
   (b) Explain the photocopying process [7+8]

5. (a) What is pulverized coal? Differentiate between coal and coke.
   (b) Write down advantages and disadvantages of pulverized coal? [8+7]

6. (a) Write a short note on fuel cell? Mention the advantages of fuel cells?
   (b) Explain the construction and working of H_2-O_2fuel cell? [8+7]

7. Draw a neat diagram of nuclear reactor and explain the following parts.
   (a) Moderator
   (b) Coolants
   (c) Control rods
   (d) Shielding [3+4+4+4]

8. (a) What is Photo voltaic cell? Explain its construction and principle of working.
   (b) Write briefly about Green house effect. [7+8]

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

I B.Tech I Semester Supplementary Examinations, Aug. 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) What is solubility product of a salt? Explain with an example how the solubility of an ionic substance can be found if its solubility product value is known.
   (b) The solubility product k_{sp} of the sparingly soluble salt Ag_2CrO_4 is 4 x 10 $^{-12}$at a particular temperature. Calculate the solubility of silver chromate in grams per litre at that temperature. The molecular weight of silver chromate is 332 ? [8+7]

2. (a) What are enzyme reactions? Explain with examples.
   (b) Write a short note on promoters and inhibitors. [8+7]

3. (a) What is Fluorescence? Discuss various applications of Florescence?
   (b) How can you distinguish between sensors and biosensors?
   (c) Outline the industrial applications of Chemiluminescence! [5+5+5]

4. (a) What are the salient features of thermo tropic, lyotropic liquid crystals?
   (b) What is the role of Band theory in semiconductors? [9+6]

5. Write a Short note on the following
   (a) Fuels
   (b) Pulverised coal
   (c) classification of fuels [5+5+5]

6. (a) Write a short note on standard electrode potential?
   (b) Derive Nernst equation for standard electrode potential? [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) Write notes on photo voltaic power plant.
   (b) Write about solar thermal power plant. [8+7]

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