

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 Petroleum 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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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) Absolute 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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**Set No. 3****I B.Tech I Semester Supplementary Examinations, Aug. 2015****ENGINEERING CHEMISTRY-I**

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**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<sub>2</sub>-O<sub>2</sub> fuel 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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**Set No. 4****I B.Tech I Semester Supplementary Examinations, Aug. 2015****ENGINEERING CHEMISTRY-I**

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**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  $\text{Ag}_2\text{CrO}_4$  is  $4 \times 10^{-12}$  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 Fluorescence?  
(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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