Code: 9ABS103 **1**

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) What are the reactions takes place in the estimation of chlorine present in water?
(b) Explain the procedure involved in the determination of chlorine present in water.

2 (a) Define corrosion and explain Pilling - Bedworth rule.
(b) Explain the factors which affect the rate of corrosion.

3 What are silicones? How they are prepared? Give an account of the properties and uses of silicones.

4 (a) What is the effect of nanotechnology on food science?
(b) What advancements of nanotechnology are referred to as nanomedicine?

5 (a) Explain the relationship between cell constant, conductivity and conductance.
(b) Define the specific resistance of a solution. Explain the specific conductance with diagrammatic illustrate of specific conductivity. What are its units?

6 (a) Draw the phase diagram of Ag (m.p 961 ^{0}C) - Pb (m.p 327 ^{0}C) alloy system forming simple eutectic at 305 ^{0}C with 97.4% Pb. Mark the areas, lines and points.
(b) Mention any three merits of phase rule.

7 (a) What is meant by synthetic petrol? How do you synthesize petrol by Fisher-Tropsch process.
(b) What is a coal? Explain the significance of anthracite coal.

8 (a) Discuss the function of gypsum in cement.
(b) Explain the various properties of refractories.

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Code: 9ABS103 **2**

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 What is hardness of water? Explain the experimental determination of hardness of water.

2 (a) Discuss the mechanism of wet corrosion.
(b) Write a note on corrosion prevention.

3 What is copolymerization? Write the preparation, properties and uses of Teflon and poly ethylene.

4 (a) How are lubricants classified? Give example.
(b) Explain the boundary film lubrication theory and the mechanism of the lubricants.

5 (a) What is a concentration cell? Explain its working with suitable example.
(b) Write short notes on EMF of a cell.

6 Draw the phase diagram of iron-carbon system and state the important reactions taking place in the system.

7 (a) Explain higher calorific value and lower calorific value and distinguish between the HCV & LCV.
(b) What are the characteristics of a good fuel?

8 (a) Discuss the four essential properties of a refractory.
(b) Explain:
(i) Thermal spalling
(ii) Refractoriness.

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Code: 9ABS103 **3**

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 What are ionic exchange resins? How will you purify water by resins and explain the advantages over other methods?

2 (a) Define corrosion and how it is prevented.
(b) Discuss the factors influencing corrosion.

3 Differentiate condensation and addition polymerization with suitable examples.

4 (a) What are explosives? What are the uses of explosives?
(b) What are the characteristics of a good explosive? Explain.

5 (a) Explain the differences between thermal and electrical insulators.
(b) Explain the use of silicone fluids as insulating materials.

6 (a) What is a eutectic? Can it be called a compound? Why?
(b) Give the applications of phase rule by taking suitable examples.

7 (a) Distinguish between solid, liquid and gaseous fuels
(b) 0.834 g of a fuel on complete combustion in excess of oxygen in bomb calorimeter, the temperature increased from 14.36 ^{0}C to 18.10 ^{0}C. The weight of water is 1350 g. Water equivalent of calorimeter is 135 g. Calculate higher calorific value of a fuel.

8 What are refractories? Explain thermal spalling, strength and porosity of the refractories.

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Code: 9ABS103

4

B.Tech I Year (R09) Regular & Supplementary Examinations, June 2013

ENGINEERING CHEMISTRY

(Common to all branches)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 Write the procedure to estimate the carbonates and sulphate of calcium present in water sample.

2 (a) Explain the differential aeration corrosion with suitable examples.
(b) Write note on galvanic series.

3 (a) Why natural rubber needs compounding?
(b) What are elastomers and how do they differ from natural rubber?

4 What are solid lubricants? Where can they be used? Give details about graphite.

5 (a) Write an essay on thermal insulators with special reference to its properties and engineering applications.
(b) What are the solid insulators? Give suitable examples.

6 (a) Name the phase reactions occurring in Fe-Fe_3C system. What are the temperatures and compositions at which they occur?
(b) After annealing, what properties improve?

7 (a) What are the gaseous fuels? How they are advantageous over other fuels?
(b) What are the different units expressed to know the efficiency of a fuel?

8 Explain the dry process for the manufacture of cement and chemical composition of cement.

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