Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

BE–101(GS)

B. E. (First/Second Semester) EXAMINATION, Dec., 2011

(Grading System)

(Common for all Branches)

ENGINEERING CHEMISTRY

[BE–101(GS]

Time : Three Hours

Maximum Marks : 70

Minimum Pass Marks : 22 (D Grade)

Note : Attempt *one* question from each Unit. Parts of the question should be attempted at one place. All questions carry equal marks.

Unit–I

1. (a) Define hardness. Explain the cause of hardness in water. 7

   (b) Discuss chemistry involved in zeolite process of softening hard water. 7

Or

2. (a) Explain scale and sludge formation. Write their disadvantages. 7

   (b) 50 ml of standard hard water containing 1000 mg of pure $CaCO_3$ per litre, consumed 20 ml of EDTA. 50 ml of water sample consumed 25 ml of the same EDTA solution. Using Eriochrome Black T as indicator, calculate the total hardness of water sample in ppm. 7

P. T. O.

Unit – II

3. (a) What is cracking ? Describe the fluid bed catalytical cracking. 7

   (b) What are fossil fuels and how are they formed ? 7

Or

4. (a) What is knocking ? How will you improve the antiknocking properties of fuel ? 7

   (b) A sample of coal was found to have the following percentage composition : 7

   C = 75%, H = 5·2%, O_2 = 12·1%, N = 3·2% and ash = 4·5%.

   Calculate the minimum amount of air necessary for complete combustion of 1 kg of coal.

Unit – III

5. (a) Define the term lubrication. Explain hydrodynamic lubrication. 7

   (b) Write a short note on portlant cement. 7

Or

6. (a) Write short notes on any *two* of the following : 7

   (i) Fire clay refractory

   (ii) Lubricants

   (iii) Setting and hardening of cement

   (b) An oil sample under test has a Saybolt universal viscosity same as that of standard Gulf oil at 210°F. The Saybolt universal visosity at 100°F are at 50, 750 and 450 respectively. Calculate the viscosity index of the sample oil. 7

Unit – IV

7. (a) Explain addition polymerization with *two* examples. 7

(b) Give preparation, properties of the following (any *two*) : 7

(i) PMMA (ii) Polyisoprene (iii) Bakelite.

Or

8. (a) What is vulcanization of rubber ? Give their applications. 7

(b) Give preparation, properties and uses of polyethylene terephthalate, neoprene. 7

Unit – V

9. (a) State the applications of I. R. spectroscopy. 7

(b) 50 ml of water sample required 5 ml of $N/50 \cdot H_2SO_4$ using methyl orange as indicator but did not give any colouration to phenolphthalein end point what type of alkalinity present. Calculate the same in ppm. 7

Or

10. (a) Define alkalinity. Explain different types of alkalinity. 7

(b) Write a short note on chromatography. 7