

Total number of printed pages – 7

B. Tech
BSCC 2201

Third Semester Examination – 2007

CHEMISTRY – II

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory
and any **five** from the rest.

The figures in the right-hand margin
indicate marks.

(At. Wt: Ca = 40, Mg = 24, Na = 23, S = 32,
O = 16, H = 1, Cl = 35.5, N = 14, Cr = 52, K = 39)

1. Answer the following questions : 2 × 10
- (a) How are exhausted ion-exchange resins
regenerated ?

9/11/08
A. M.

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(b) Why is chloramines preferred over bleaching powder or chlorine for sterilization?

(c) A good fuel should have low ash content. Explain.

(d) What is the role of ethyl bromide in petrol?

(e) What do you mean by knocking?

(f) What are the monomers for perlon u (poly urethane)?

(g) Why does natural rubber need compounding?

(h) What is the importance of dissolved oxygen in water?

(i) What is a catalytic converter?

(j) What are the advantages of tinned brass utensils?

2. (a) Distinguish between gross and net calorific value of a fuel? 3

(b) How is moisture content of coal determined? 2

(c) A sample of coal was found to contain the following:

C = 76%, O = 5%, S = 2%, H = 9%, N = 1% and rest ash. Calculate the gross and net calorific value of 1 kg of coal. Calculate the minimum amount air required for complete combustion of 1 kg of coal. (air contains 21% oxygen, latent heat of steam = 587 kcal/kg). 5

3. (a) What is water gas ? How is it prepared ?
What are its uses ? 4

(b) What are octane and cetane number ? Why
are they important ? 4

(c) Why is producer gas used immediately ?
2

4. (a) Differentiate between scale and sludge ?
How they are formed and what are their
disadvantages ? 4

(b) What is caustic embrittlement ? How can it
be avoided ? 4

(c) Why is calgon better than phosphate
conditioning ? 2

5. (a) Describe zeolite process. What are the
advantages and disadvantages of the
process ? 5

(b) 50 ml of standard hard water required
46 ml of EDTA solution. 50 ml of water
sample required 20 ml of EDTA solution.
While 50 ml of the boiled water sample
required 12 ml of EDTA solution. Calculate
each type of hardness of water. (1 ml of
SHW = 1 mg of CaCO_3). 5

6. (a) Distinguish between addition and conden-
sation polymerisation. 4

(b) Discuss the method of manufacturing and uses of bakelite. 4

(c) Why do rubber becomes stiff on stretching? 2

7. (a) Why is corrosion accelerated when the anode is smaller than cathode but not when the situation is reversed? 2

(b) What is cathodic protection? Explain sacrificial anode method. 4

(c) What happens and why? 4

(i) Bolt and nuts made of different metals

(ii) Deposition of dust on iron surface.

8. (a) What is green house effect? Name the gases responsible for it. 2

(b) Discuss the anaerobic digestion process of waste water treatment. 4

(c) What are the importance of COD measurement? Calculate the COD of a sample when 25cc of the sample required 9cc of 0.001M dichromate solution. 4