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B. Tech  
BSCC 2201

Third Semester Examination – 2007

CHEMISTRY – II

Full Marks – 70

Time : 3 Hours

IWL

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 ?

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A. Singh

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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 (polyurethane) ?

(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  $\text{CaCO}_3$ ). 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

IWL