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Total number of printed pages – 7

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Fourth Semester Examination

CHEMISTRY – II

Full Marks – 70

Time – 3 Hours

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

*The figures in the right-hand
indicate marks.*

1. ✓ Answer in brief :

(a) ✓ Why is chloramine better
for sterilization of water ?

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- (b) ✓ Why is buffer added during
hard water against hard water
buffer is added ?
- (c) ✓ Why is net calorific value less
calorific value ?
- (d) ✓ Which is superior : water gas
gas and why ?
- (e) ✓ Why is weight average molecular
of a polymer always higher than
average molecular mass ?
- (f) Write the monomers of :
- (i) polyurethane rubber
 - (ii) butyl rubber
 - (iii) nylon 6
 - (iv) terylene.

8. (c) Give the conductivity of
(a) Distinguish between wrought iron and die cast iron
(b) What is the function of a heat exchanger?
(c) What are the advantages of their structure?
(d) How is the life of a living cell determined?

(g) ✓ What is the importance of the element?

(h) ✓ What is caustic embrittlement?

(i) ✓ Which one is preferable for joining copper rivets in steel plate or in copper plate?

(j) What is the difference between the properties of aluminium and magnesium?

2. ✓ (a) ✓ Why is hardness of water expressed in terms of calcium carbonate?

(b) ✓ What is scale? What are the stages of scale formation?

(c) ✓ 50 ml of standard hard water (containing CaCO_3) required 90 ml of Na_2CO_3 for detection of end point.

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3. ✓

(a) ✓

sample required 18 ml of
and 50 ml of the boiled
required 11 ml of EDTA soln
the carbonate and n
hardness of the water sam

(a) What is cracking ? What
tages of catalytic crackin

(b) ✓

(b) What are the differences
and gasoline fuel ?

(c) ✓

(c) What are the advantag
motor fuel ?

4.

(a) ✓

(a) What is coking coal ?

(b) ✓

(b) Discuss about Otto Hoffr
manufacturing of coke.

(c) ✓

(c) The percentage analys
volume) is $H_2 = 19$, CO

8. (c) Give the conductivity
- (a) Distinguish between aerobic and anaerobic digestion
- (b) What is the purpose of a heat exchanger in a biogas plant?
- (c) What are the advantages and disadvantages of different types of biogas plants?
- (d) How is the biogas produced from a biogas plant used?

5.

(a)

$\text{CH}_4 = 4$ and $\text{CO}_2 = 6.1$. Calculate the amount of oxygen product obtained if 20% excess oxygen is supplied for complete combustion.

(a) Discuss the biochemical treatment of arsenic and fluoride.

(b)

(b) Discuss about the secondary treatment methods.

(c)

(c) 20 ml of sewage water was titrated with 0.2 N dichromate solution in sulphuric acid and unreacted dichromate required 18 ml of 0.1 N FAS (Ferrous Ammonium Sulphate) solution for reduction. Blank titration required 10 ml of same FAS solution under same conditions for neutralization. Calculate the COD of the sample.

8. (c) Give the conductivity
- (a) Distinguish between aerobic and anaerobic digestion
- (b) What is the purpose of a heat exchanger in a biogas plant?
- (c) What are the advantages and disadvantages of different types of biogas plants?
- (d) How is the biogas produced from a living cell?

5.

- (a) Discuss the biochemical effects of arsenic and fluoride.
- (b) Discuss about the second stage of wastewater treatment methods.
- (c) 20 ml of sewage water was titrated with 0.2 N dichromate solution in sulphuric acid and unreacted dichromate required 18 ml of 0.1 N Ferrous Ammonium Sulphate (FAS) solution for reduction. Blank titration required 10 ml of same FAS solution under same conditions for neutralization. Calculate the COD of the sample.

8. (c) Give the conductivity of the following substances.
- (a) Distinguish between electrolytes and non-electrolytes.
- (b) What is the difference between a strong and a weak electrolyte?
- (c) What are the factors affecting the conductivity of an electrolyte solution?
- (d) How is the conductivity of an electrolyte solution related to its concentration?

8. (a) What do you mean by chlorination? What are its applications?
- (b) Compare the permutite and lime-soda methods of water softening.
- (c) Why is a small amount of lead added to petrol?

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