Applied Chemistry 1
DEC 17

First Year Engineering (Semester 1)

Total marks: 80
Total time: 3 Hours

INSTRUCTIONS
(1) Question 1 is compulsory.
*(2) Attempt any **three** from the remaining questions.*
(3) Draw neat diagrams wherever necessary.

1(a) Distinguish between BOD and COD

(3 marks)

1(b) Give the preparation, properties and uses of Kevlar

(3 marks)

1(c) Calculate total hardness, in ppm, in given water sample .
i) 50ml standard hard water, containing 1mf pure $CaCO_3 CaCO_3$ per ml, consumed 20ml EDTA solution.
ii) 50ml water sample consumed 30ml EDTA solution using EBT indicator

(3 marks)

1(d) Define flash point and fire point? Give its significance.

(3 marks)

1(e) State the number of phases, component, for the following equilibrium.
i) $H_2O(s) \leftrightarrow H_2Oi \leftrightarrow H_2Og H_2O(s) \leftrightarrow H_2Oi \leftrightarrow H_2Og$
ii) Mixture of Rhombic and monoclinic sulphur

(3 marks)

1(f) What are plasticizers? Give its uses and examples

(3 marks)

1(g) Write a brief note on CNT's

(3 marks)

2(a) Calculate the quantity of lime and soda required for softening of 1,00,000 litres of water containing the following impurities in ppm. The purity of lime is 70% and soda is 85% $Ca(HCO_3)(HCO_3)=30.2$, $Mg(HCO_3)(HCO_3)=20.8$, $CaCl_2 CaCl_2=28.1$, $MgCl_{2}=8.788.78$, $CaSO_4 SO_4=35$, $MgSO_4 SO_4=6.7$.

(6 marks)

2(b)i Distinguish between thermoplastic and thermosetting resins

(3 marks)

2(b)ii What are the functions of lubricants

(2 marks)

2(c) What is Decay of concrete? Discuss its prevention

(4 marks)

3(a) Define Fabrication. List the methods used. Discuss extrusion moulding in detail

(6 marks)

3(b)i What are the limitations of Phase rule?

(3 marks)

3(b)ii Draw a neat, labeled diagram of the rotatory kiln
3(c) 15000 litres of hard water was passed through & zeolite softener.
The exhausted zeolite required 120litres of NaCl having stream of 30 g/l of NaCl.
Calculate the hardness of water.

(3 marks)

4(a) what is activated sludge. How is the process carried out for treatment of waste water
Explain with a flow sheet diagram.

(6 marks)

4(b)i 20ml of lubricating oil was dissolved in alcohol. The solution was titrated against 0.1N KOH
solution. At the end point the burette reading was found to be 2.5ml. Calculate the acid value of the
oil.(density of oil=0.86g/ml)

(3 marks)

4(b)ii Distinguish between the dry and wet process for manufacturing of Portland cement

(3 marks)

4(c) List the uses of polymer in medicines and surgery

(3 marks)

5(a) Write a note on (any two):- (6 marks)**i)** Glass transition temperature
ii) Conducting polymers c)Vulcanization

(3 marks)

5(b)i Discuss the treatment of water using bleaching powder

3 marks)

5(b)ii Explain the mechanism of Extreme pressure lubrication

2 marks)

5(c) What is reduced phase rule? Draw the diagram of the Ag-Pb system with
proper labeling

(4 marks)

6(a) What are the conditions for use of solid lubricants? Discuss the structure
and uses of Graphite?

(6 marks)

6(b)i Discuss triple point in one component system.

3 marks)

6(b)ii Explain reverse osmosis.

(2 marks)

6(c) Write a note on fullerene

(4 marks