LAST MOMENT TUITIONS

Applied Chemistry 2 - May 18

First Year Engineering (Semester 2)

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.
*(4) Atomic wt: **Al=27**,**Ca=40**,**S=32**,**Cl=35.5**,**Fe=56**,**K=39**,**C=12**,**N=14**,**O=16**,**Na=23**,**Mg=24***

1(a) Define power alcohol. Give any two advantages of power alcohol. (3 marks)

1(b) Explain why cathodic coating is preferred over anodic coating for manufacturing of containers to store food stuffs. (3 marks)

1(c) A sample of coal has the following compositions :- C=70%,O=23%,H=5%,S=1.5%,N=0.4% and ash=0.1%.Calculate the G.C.V of this fuel. (3 marks)

1(d) Give the composition, properties and uses of high phosphorus bronze. (3 marks)

1(e) Why is it essential to design safer chemicals and products w.r.t green chemistry (3 marks)

1(f) What is the matrix phase and particle phase in concrete ? Give any two properties of concrete (3 marks)

1(g) Porous film is called as 'Non Protective film'. Explain with an example (3 marks)

2(a) Define electrochemical corrosion. Explain Intergranular corrosion with a neat labelled diagram. aqueous medium. (6 marks)
2(b).i 1.95 gm of a coal sample was taken for nitrogen estimation by Kjeldahi's method. The ammonia liberated required 9.5ml of 0.4N H2SO4H2SO4 for neutralization. Calculate the percentage of Nitrogen in coal sample.

(3 marks)

2(b).ii Write a note on Green solvents (2 marks)

2(c) Explain the structual composition of plywood. (4 marks)

3(a) Define fuel cell. Explain Hydrogen Oxygen fuel cell with a neat labelled diagram. (6 marks)

3(b).i Define shape memory alloy. Give its properties and uses. (3 marks)

3(b).ii Define Bio Diesel and give its advantages (2 marks)

3(c) Calculate the % atom economy of the following reaction w.r.t the product acetophenone
$C_6H_6+CH_3COCl \rightarrow C_6H_5COCH_3+HCl$ (4marks)

4(a) What is cathodic protection? Explain impressed current cathodic protection with its applications. (6 marks)

4(b).i What is Green Chemistry .Give its significance (3 marks)

4(b).ii Define composite. Give any two applications of composite material. (2 marks)

4(c) What is powder metallurgy? Explain hot compaction method with a neat labelled diagram. (4 marks)

5(a) A gaseous fuel contains H_2=50%,CH_4=30%,N_2=2%,CO%=7%,C_2H_4=3%,C_2H_6=5% and water vapour = 3%.Calculate weight and volume of air required for $2m^3$ of gas. (Molecular weight of air = 28.949) (6 marks)

5(b).i List the three main constituents of paints and give functions of each (3 marks)

5(b).ii Explain the effect of the following alloying elements on steel a) Chromium b)Tungsten (2 marks)

5(c) Explain conventional and Green route of manufacturing of Ibuprofen Highlight the green chemistry principle involved. (4 marks)

6(a) Write short notes on : a) Compacting b) Sintering (6 marks)

6(b).i What are Fiber Reinforced composite. (3 marks)

6(b).ii Explain how areas of anode and cathode effect the rate of corrosion. (2 marks)

6(c) Explain the determination % Moisture and % volatile matter in a coal sample. (4 marks)