LAST MOMENT TUITIONS

Applied Chemistry 2 - May 17

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) Gold does not get corroded due to oxidation. Why? (3 marks)

1(b) Give the composition, properties and uses of Duralumin. (3 marks)

1(c) Define octane number and cetane number. (3 marks)

1(d) Give classification of composite materials. (3 marks)

1(e) List any six principles of green chemistry. (3 marks)

1(f) Explain the advantages of galvanizing over tinning. (3 marks)

1(g) A coal sample contains C=70%, 0=23% H=5%, N = 0.4% Ash = 0.1% Calculate GCV and NCV of the fuel. (3 marks)

2(a) Explain the following factors affecting the rate of corrosion.
i) Relative areas of anode and cathode ii) pH of medium iii) Purity of metal (6 marks)

2(b).i 0.5 gm of coal sample was burnt in Bomb Calorimeter experiment produced 0.06 gm of BaSO4. Calculate percentage of sulphur. (3 marks)

2(b).ii What is supercritical CO2CO2? Give one application of it. (2 marks)

2(c) Write a note on sandwich panel type layered composites. (4 marks)

3(a) With neat and labelled diagram explain fixed bed catalytic cracking. (6 marks)

3(b).i Write a note on atomization. (3 marks)

3(b).ii What is pigment? Give its two functions. (2 marks)

3(c) Calculate the % atom economy of the following reaction

$CH_3NH_2+COCl_2 \rightarrow CH_3N=C=O+2HCl$ (4 marks)

4(a) Explain with the help of diagram wet corrosion in neutral medium. (6 marks)

4(b).i Expain the green chemistry principle 'prevention of waste'. (3 marks)

4(b).ii Write a note on 'Matrix phase' of composite material (2 marks)

4(c) Mention four drawbacks of plain carbon steel (4 marks)

5(a) Calculate weight of air needed for complete combustion of 2kg of coal containing C=70%, H=10%, 0=10%,N=5% and remaining ash. (6 marks)

5(b).i Explain the method of impressed current cathodic protection (3 marks)

5(b).ii Give two purposes of alloying. (2 marks)

5(c) Explain conventional and green route of manufacturing of Adipic acid. (4 marks)

6(a) What is compaction in powder metallurgy?Explain powder injection moulding method with suitable diagram. (6 marks)

6(b).i Mention the characteristic properties of composite materials. (3 marks)

6(b).ii Distinguish between anodic protection and cathodic protection (2 marks)

6(c) Define fuel. Give the characteristics of good fuel. (4 marks)