S.B. Roll No. _____

APPLIED CHEMISTRY-II
2nd Exam/Common/2254/May 2011

Duration: 3 hours   M. Marks: 75

Section A

1. Fill in the blanks: 1x15=15
    i) The naturally occurring compound of metal is known as _____
    ii) Slow and continuous decay of metals by mechanical force is knows as _____
    iii) Protection of Fe from corrosion by cementation of Cr. is known as _____
    iv) Q kJ heat is obtained by combustion of V m^3 of gaseous fuel, its calorific value = _____
    v) Main hydrocarbon constituent of biogas is _____
    vi) The Government of India set up _____ on 1st March 2002 under the provisions of the Energy Conservation Act, 2001.
    vii) Coke number of lubricating oil is measure in _____
    viii) Suspension of graphite in water is called as _____
    ix) Pigmented varnish is called _____
    x) Silica (SiO_2) bricks are used in lining roof of _____

State following statement is TRUE or FALSE:
    xi) Chloroethene is the monomer of PVC.
    xii) Natural rubber is an elastomer.
    xiii) Styrene butadiene rubber (SRB) is also known by Buna-S.
    xiv) Earth's most water is locked in the form of ice at north and south poles.
    xv) PCBS (Polychlorinated biphenyls) used as fluid in transformers and capacitors are less carcinogenic pollutes.

Section B

Answer any FIVE of the followings: 6x5=30

2. a). Define smelting of concentrated ore.
   b). Give the composition, one important property and application of Nichrome.
3. a). Can we store copper sulphate solution in iron container? Give reason in either case. (Use standard electrode potentials of Fe and Cu -0.44V and +0.34V respectively).
   b). Write Dulong's formula with usual notations and calculate higher calorific value (HCV) of the coal sample containing 86% of C, 10% H and 4% O in kilocalories per kilograms.

4. a). In a proximate analysis of coal two grams of coal sample is heated to 105°C, for half an hour cooled and weighed is found to weigh 1.95g, then it further heated to 925°C with covered lib in muffle furnace for five minutes, then cooled and found to weigh 1.85g. The residue is heated strongly to obtain ash 0.100g,calculate percentage of moisture, volatile matter and ash content in the coal sample.
   b). What is power alcohol?
5. a). Define fire point, flash point, viscosity and viscosity index (VI), pour point and cloud point of oil.
   b). What is an enamel? Write constituents and applications of enamels.
6. a). What are semiconductors? How are these classified? Give an example and applications of each type.
   b). Explain condensation polymerization using nylon as an example.
7. a). Define homopolymer and copolymer with suitable explain.
   b). Give three main causes of water pollution.

Section C

Answer any THREE of the followings: 10x3=30
8. a). What are the applications of geosythetic and ceramic materials?
   b). Explain rusting of iron using electro-chemical theory (when cathodic area> anodic area)
9. a). What is cetane number? How chemical structures of fuel influence the cetane number?
   b). Explain total acidity, coke and aniline number of a lubricant.
10. a). Describe with neat diagram the sacrificial anodic protection of base metal iron form corrosion.
    b). Differentiate between thermoplastics and thermosetting plastics.
11. a). Explain Free energy change and Ellingham diagrams their usefulness and in metallurgy.
    b). What are the characteristics of a good fuel?