



May - June 2011

[3961] - 108

F.E. (Semester - II) Examination, 2011
APPLIED SCIENCE - II (Chemistry)
(2008 Pattern)

Time : 2 Hours



Max. Marks : 50

- Instructions:**
- 1) Answers 3 questions.
 - 2) Black figures to the **right** indicate full marks.
 - 3) Neat diagrams must be drawn **wherever** necessary.
 - 4) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is **allowed**.

1. A) What are rocket propellants ? Give different types with example. Explain cetane number of fuel. 7
- B) Explain the principle and method for determining Calorific value of solid, liquid fuels. 6
- C) Find the % of C and H in coal sample from the following data- 0.20 gm of coal on burning in a combustion tube in presence of pure oxygen was found to increase in the weight of CaCl_2 tube by 0.08 gm and KOH tube by 0.12 gm. 4

OR

2. A) Explain merits and demerits of power alcohol.
Explain octane number of fuel. 7
- B) Explain production, properties and storage and transportation of H_2 gas. 6
- C) 2.4 gm of coal sample was weighed in silica crucible. After heating for one hour at 110°C , the residue weighed as 2.25 gm. The crucible was then covered with a vented lid and strongly heated for exactly 7 minutes at 950°C . The residue weighed as 1.42 gm. The crucible was further heated without lid until a constant weight was obtained. The last residue was found to be 0.22 gm. Calculate the % results of the above analysis. 4



3. A) What is Electrochemical Corrosion ? Explain the mechanism of it. 7
- B) Discuss the various factors affecting corrosion. 6
- C) Explain Cathodic protection method for corrosion. 4

OR

4. A) Explain the mechanism of corrosion due to oxygen with respect to Na, Mg, Au, Cr, and Mo metals and state Pilling -Bedworth rule. 7
- B) Give different types of surface conversion coatings. 6
- C) Explain concentration cell corrosion. 4
5. A) What are the scales and sludges ? Give their formation, disadvantages and preventive measures in boiler. 6
- B) i) Find the hardness of water sample from the given data - A zeolite bed gets exhausted on softening 2400 lit. of water and requires 10 lit. of 8% NaCl for regeneration.
- ii) 100 ml of water sample requires 4.3 ml of 0.02 N HCl upto phenolphthalein end point and total 11.9 ml upto methyl orange end point. Calculate the type and amount of alkalinity present. 6
- C) In water system, name the phases in equilibrium at the following conditions :
- i) -273°C
- ii) 0.0075°C and 4.58 mm pressure
- iii) 374°C and 218.5 atm pressure.
- iv) 0°C and 1 atm pressure. 4

OR

