Nov - Dec
2011

Total No. of Questions : 6] [Total No. of Printed Pages : 2

# [4061]-108

## F. E. Examination - 2011

## APPLIED SCIENCE - II

## (CHEMISTRY)

**(2008 Pattern)**

**Time : 2 Hours]** **[Max. Marks : 50**

***Instructions :***

*(1) All questions are compulsory.*

*(2) Black figures to the right indicate full marks.*

*(3) Neat diagrams must be drawn wherever necessary.*

*(4) Assume suitable data, if necessary.*

*(5) Use of logarithmic tables, slide rule, mollier charts, electronic pocket calculator and steam tables is allowed.*

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**Q.1)** (A) What is Ultimate Analysis ? Explain determination of percentage of Carbon and Hydrogen with principle, chemical reaction and formulae. **[07]**

(B) Define Rocket Propellant ? Give characteristics of a good Propellant. Classify the Propellants with explanation and examples. **[06]**

(C) 0.072 gm of a fuel containing 80% carbon when burnt in a Bomb Calorimeter, increased temperature of water from 27.3°C to 29.1°C. If the calorimeter contains 250 gm of water and its water equivalent is 150 gm, calculate GCV of the Fuel. **[04]**

**OR**

**Q.2)** (A) Write a note on Refining of Petroleum with principle of Refining, diagram of Refining and various fractions which are used as fuel with their B.P., composition and applications. **[07]**

(B) Write a note on Bio-diesel. **[06]**

(C) A petrol sample contains 14% H and 86% C, calculate the quantity of air required for complete combustion of 1 kg petrol. **[04]**

**Q.3)** (A) Explain various Cathodic Protection Methods to control corrosion with principle, figures and applications. **[07]**

(B) Write a note an Electroplating with principle, diagram and applications. **[06]**

(C) Differentiate between Anodic Coatings and Cathodic Coatings. **[04]**

**OR**

**Q.4)** (A) What is Electro-chemical Corrosion ? Explain Electro-chemical Corrosion by evolution of Hydrogen Gas and absorption of Oxygen Gas. **[07]**

(B) Explain various factors affecting Rate of Corrosion. **[06]**

(C) Explain Atmospheric Corrosion of Na and Cr with chemical reactions and nature of oxide film. **[04]**

**Q.5)** (A) How alkalinities of water sample is determined ? Explain it with procedure, formulae and table of determination. **[06]**

(B) What are the Scales ? Give their formation, disadvantages and preventive measures in Boiler. **[06]**

(C) 50 ml of a water sample requires 12.7 ml of 0.02 M EDTA during titration. Calculate total hardness of the water sample. **[04]**

**OR**

**Q.6)** (A) Draw and explain phase diagram of Sulphur System with respect to areas, curves and triple points. **[06]**

(B) Explain Corrosion of Boiler by dissolved gases and dissolved salts with chemical reactions and its preventions. **[06]**

(C) An Exhausted Zeolite Softener was regenerated by passing 150 litres of Sodium Chloride Solution having strength 150 gm/litre of NaCl. How many litres of hard water sample having hardness 400 ppm can be softened by using this softener ? **[04]**

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