



[4656] – 22

Seat No.	
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F.E. (Semester – II) Examination, 2014
APPLIED SCIENCE – II (Chemistry)
(Old) (2008 Course)

Time : 2 Hours

Max. Marks : 50

- Instructions :** 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
2) **Neat** diagram must be drawn **wherever** necessary.
3) Figures to the **right** indicate **full** marks.
4) Assume suitable data, if **necessary**.

1. A) Define calorific value of fuel. How it can be determined using Bomb Calorimeter ? **7**
B) Write a note on Bio-diesel, mentioning its preparation reaction, merits and demerits. **6**
C) One gram coal sample was burnt in oxygen. Carbon dioxide was absorbed in KOH and water-vapour in CaCl₂. The increase in weight of KOH and CaCl₂ was 2.05 and 0.55 gm respectively. Determine the % C and % H in the sample. **4**
OR
2. A) Explain the process of refining of petroleum with diagram. Give composition, boiling range and use of any three fractions obtained. **7**
B) Define the term knocking. Explain octane number and cetane number of fuel. **6**
C) Volumetric analysis of producer gas is H₂ = 25%, CO = 20%, N₂ = 40%, CH₄ = 2%, CO₂ = 13%
Find the volume of air required for complete combustion of 1m³ of gas. **4**
3. A) What is electrochemical corrosion ? Explain its mechanism by hydrogen evolution and oxygen absorption. **7**
B) Describe cathodic protection methods to prevent corrosion. **6**
C) What is metallic coating ? Which coating is better anodic or cathodic ? Explain. **4**
OR
4. A) Define corrosion. Explain dry corrosion due to oxygen. Explain with examples how nature of oxide film affects corrosion. **7**
B) Discuss various factors affecting the rate of corrosion, w.r.t. nature of metal and environment. **6**
C) Write a note on electroplating. **4**

P.T.O.



5. A) What are scale and sludges ? Give their formation, disadvantage and preventive measures in boiler. 6
- B) State Gibb's phase rule. Define the terms involved in it with examples. 6
- C) 100 ml of water sample requires 4 ml of N/50 H_2SO_4 up to phenolphthalein end point and 20 ml for complete neutralization. Find the type and amount of alkalinity in the water sample. 4

OR

6. A) Draw and explain phase diagram of water system with respect to areas, curves and triple point. 6
- B) Explain the Zeolite method of water softening with figure, process, reaction and advantages. 6
- C) Write a note on caustic embrittlement. 4
