Total No. of Questions—**6**] [Total No. of Printed Pages—**3**

Seat No.	

[4856]-22

F.E. (Second Semester) EXAMINATION, 2015

APPLIED SCIENCE

Paper II

(Chemistry)

(2008 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Solve Q. No. **1** *or* Q. No. 2, Q. No. **3** *or* Q. No. 4, Q. No. **5** *or* Q. No. **6.**

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

(*iii*) Figures to the right indicate full marks.

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

1. (*a*) Define calorific value of fuel. How it can be determined using Bomb calorimeter method ? [7]

(*b*) Write a note on power alcohol, mentioning its preparation reaction, merits and demerits. [6]

(*c*) 1 g coal sample in Kjeldhal's experiment liberated NH_3 which was absorbed in 40 ml N/10 H_2SO_4. The resultant solution required 10 ml N/10 H_2SO_4 for complete neutralization. Calculate % Nitrogen. 2.0 g coal sample was subjected to Eschka method to form 0.25 g of $BaSO_4$ precipitate. Calculate % Sulphur in coal sample. [4]

P.T.O.

Or

2. (*a*) Explain the process of distillation of crude oil. Mention composition, boiling range and use of any three fractions obtained. [7]

(*b*) Explain production, properties and applications of hydrogen gas. [6]

(*c*) Differentiate between low and high temperature carbonization. [4]

3. (*a*) Define corrosion. Explain mechanism of dry corrosion due to oxygen. Mention the chemical reactions and nature of oxide film formed with respect to corrosion of Na, Cr and Mo. [7]

(*b*) Explain various factors affecting rate of corrosion. [6]

(*c*) Write a note on Galvanization. [4]

Or

4. (*a*) Define wet corrosion. Explain its mechanism by evolution of hydrogen and absorption of oxygen. [7]

(*b*) Explain cathodic protection methods for prevention of corrosion. [6]

(*c*) Differentiate between anodic and cathodic coating. [4]

5. (*a*) Explain deionization of water with diagram. [6]

(*b*) Draw and explain phase diagram of water system with respect to areas, curves and triple point. [6]

(*c*) 25 ml of water sample was titrated against 0.01 M $AgNO_3$ solution by Mohr's method. The titre value was 5.0 ml. Find the quantity of chloride ions present per litre of water and express the answer in terms of $CaCO_3$ equivalent. [4]

Or

6. (*a*) Define Gibbs' phase rule. Explain the various terms involved in it with examples. [6]

(*b*) Define hardness of water. Explain the EDTA method to estimate hardness of water. [6]

(*c*) Write a note on priming. [4]