Seat No. | | | | | | |

* 2 5 2 9 *

AOI1307

Engineering Chemistry - II
(102112)

P. Pages : 2

Time : Three Hours **Max. Marks : 80**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** sub questions from each unit.
5. Assume suitable data wherever necessary & State the assumptions made.
6. Diagrams/ sketches should be given wherever necessary.
7. Use of logarithmic table, drawing instruments and non programmable calculators is permitted.
8. Figures to the right indicate full marks.

UNIT - I

1. a) Explain with figure the determination of net calorific value by Bomb calorimeter with it's corrections. **8**

b) i) What is proximate analysis of coal ? Explain determination of moisture and volatile matter present in coal. **4**

ii) Describe the fractional distillation of petroleum. **4**

c) i) Explain preparation, properties and uses of water gas with suitable diagram. **4**

ii) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were recorded . **4**

a) Volume of gaseous fuel burnt at N.T.P - 0.093m^3.
b) Weight of water used for cooling - 30.5 kg.
c) Weight of steam condensed - 0.031 kg.
d) Temperature of inlet water - 26.1°C.
e) Temperature of outlet water - 36.5°C.

Determine the gross calorific value and net calorific value of the gaseous fuel/m^3 at N.T.P.

Latent heat of condensation - 587 kcal / kg.

UNIT - II

2. a) What is flash and fire - point ? Describe pensky - Marten's apparatus for the determination of flash and fire point of oil. 8

b) i) Explain with figure fluid - film lubrication. 4

ii) Discuss criteria for selection of lubricants for internal combustion engine and Refrigeration system. 4

c) i) What is cloud and pour point of an oil ? How it is determined. 4

ii) Explain neutralisation number and describe it's determination. 4

UNIT - III

3. a) Describe the preparation, properties and applications of the following refractories - 8

a) Silica refractory. b) Graphite refractory.

b) i) Explain the essential characteristics of a good refractory. 4

ii) Explain Magnesite refractory. 4

c) i) Give the preparation, properties and applications of Fire-Clay refractory. 4

ii) Describe Dolomite refractory. 4

UNIT - IV

4. a) What is meant by "Electrochemical corrosion'. Discuss it's mechanisms. 8

b) i) Explain with figure pitting corrosion. 4

ii) Discuss the importance of design and material selection in controlling corrosion (Any two). 4

c) i) What is cathodic protection ? How is it controlled by sacrificial anode method. 4

ii) Explain about electroplating. 4

UNIT - V

5. a) Give causes, effects and control measures of water pollution. 8

b) i) Explain in detail 'acid - rain'. 4

ii) Define and explain determination of biological oxygen demand (B.O.D.). 4

c) i) Discuss 'Green - house effect'. 4

ii) Give causes, effects and control of radioactive pollution. 4

****