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मक्षिका - 002

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 if necessary.
6. Figures to the right indicate full marks.
7. Use of logarithmic tables, drawing instruments and non-programmable calculators is permitted.

UNIT - I

1. a) Describe the method of determination of calorific value of volatile fuel using Boy's calorimeter. 8
b) i) Explain the process of fractional distillation. 4
ii) Explain the preparation and uses of water gas. 4
c) i) Explain the term gross calorific value and net calorific value. 4
ii) Calculate the volume of air needed for complete combustion of 1m^3 of gaseous fuel having the composition : carbon monoxide = 48%, $\text{CH}_4 = 8\%$, $\text{H}_2 = 40\%$, $\text{C}_2\text{H}_2 = 2\%$, $\text{N}_2 = 1.0\%$ and remaining being ash. 4

UNIT - II

2. a) Explain flash point, fire point and its determination using Pensky - Marten's apparatus. 8
b) i) Explain the mechanism of boundary lubrication. 4
ii) Describe the term 'saponification value'. 4

- c) i) Explain the characteristics of a good lubricant. 4
- ii) What will be the rules to select a lubricant to be used in Internal combustion engine and gears. 4

UNIT - III

3. a) Explain the preparation properties and uses of Dolomite refractory. 8
- b) i) What do you mean by term 'refractory' ? Give the uses of fireclay refractory. 4
- ii) Explain the preparation and uses of carbon refractory. 4
- c) i) Explain the preparation and uses of silica refractory. 4
- ii) Explain the characteristics of a good refractories. 4

UNIT - IV

4. a) Describe the process and mechanism of electrochemical corrosion. 8
- b) i) Explain stress corrosion by any one process. 4
- ii) Explain anodic protection. 4
- c) i) Describe the process of tinning. 4
- ii) Explain water line corrosion. 4

UNIT - V

5. a) Explain the causes, effects and control of Radioactive pollution. 8
- b) i) Explain the control measures of water pollution. 4
- ii) Explain acid rain formation and its ill effect. 4
- c) i) What are the ill effects of air pollution on human beings. 4
- ii) Explain the term 'BOD' and its determination. 4
