Code No. 2338

FACULTY OF ENGINEERING

B.E. 4/4 (M/P) II-Semester (Main) Examination, April / May 2013

Subject : Fuels and Combustion
(Elective-III)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Write the classification of coal.
2. What is manufactured fuel and explain the agro fuels?
3. Explain the petroleum distillation process.
4. Describe the source, major composition and calorific value of
   (i) coal gas (ii) coke oven gas (iii) Blast furnace gas
5. Explain the necessity of excess air for burning fuels.
6. Calculate the theoretical air required for the complete combustion of 1kg of the following:
   (i) Carbon (ii) Carbon monoxide
7. Describe the theory of flame propagation.
8. Explain any one method of flame stabilization.
9. What are the effects of direct burning of edible oil in diesel engines?
10. Write the advantages and disadvantages of the use of LPG petrol engines.

PART – B (5x10=50 Marks)

11.(a) Describe the method of determination of heating of coal.
   (b) Describe the coal gasification process.

12.(a) The percentage composition of a sample liquid fuel by weight is : C = 84.8% and Hydrogen = 15.2%. Calculate (i) The weight of air need for combustion 1 kg of fuel. (ii) Volumetric analysis of the products of combustion, if 15% excess air is supplied. (7)
   (b) Describe the method of storage and handling of liquid fuels. (3)

13.(a) The volumetric analysis of a fuel gas is CO_2 = 14%; CO=1%; O_2=5% and N_2 = 80%, calculate the fuel gas composition by weight.
   (b) What is the difference between higher heating value and lower heating value of fuels?

14.(a) Describe autoignition process.
   (b) Describe the design consideration of coal, oil and gas burners.

15.(a) Describe the methods of conversion of edible oils for use in diesel engines.
   (b) Discuss the features and limitations of the use of Hydrogen in petrol engines.

16.(a) Describe the working of Junkers gas calorimeter.
   (b) Describe the conversion of volumetric analysis to weight analysis and weight analysis to volumetric analysis.

17. Write short notes on the following: (10)
   (a) Combustion in SI engines
   (b) Theoretical flame temperature calculations
   (c) Methods of measurement of burning velocity

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