

Centre for Energy Studies

Time : 1 hr.

ESL-711 Fuel Technology
Minor Test - I

Marks : 20

PART A : 13 Marks

1. A sample of air-dried coal on analysis shows (experimentally determined values % by weight) :

Moisture	=	2.6
Ash	=	12
Volatile Matter	=	41

And on dry basis it shows :

Carbon	=	66.4
Hydrogen	=	4.7
Nitrogen	=	3.7
Sulphur	=	0.5

Calculate

- % fixed carbon on dry basis
- % oxygen on air dried basis
- % volatile Matter on dry mineral matter free basis
- % Hydrogen on air dried basis
- Calorific value on air-dried basis calculated using ultimate analysis data.

$$\left(\frac{1}{2} + \frac{1}{2} + 1 + 1 + 2 = 5\right)$$

2. Explain the following :

- Coal seam and coal measure
- Indian Coals are believed to be of drift origin
- Wood charcoal is good but costly fuel as compared to dry wood.
- Geochemical stage of coal origin
- Inherent moisture content and inherent ash content of coal
- Presence of low melting mineral components and sulphur in coal is problematic.

$$(1+1+1+2+1+2=8)$$

PART B : 7 Marks

1. Write short notes on the following topics :

- Asphaltic crudes
- Geological methods of oil detection/exploration (4)

2. Describe the one major difference between the origin of petroleum crude oil and coal. (1)

3. Answer Yes or No

- Indian crudes are of mostly sour
- Middle East crudes are of mixed base type.
- Aromatics are predominantly present in naphthenic crudes.
- United Arab Emirates (UAE) is the number one oil producing country in the world. (2)