22312

11920

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) State any two units of energy.

b) List four environmental benefits of wind energy.

c) State the use of Lux Meter and Tachometer in energy audit.

d) List various types of costs.

e) Define balance sheet.

f) List the two factors affecting on cost estimation.

g) State two objectives of energy audit.

Marks

2. Attempt any THREE of the following: **12**

a) Classify energy sources with two examples each.

b) Explain construction of biogas plant.

c) Explain energy conservation and its importance.

d) Describe profitability evaluation by rate of return on investment.

3. Attempt any THREE of the following: **12**

a) Define calorific value. Differentiate between net calorific value and gross calorific value.

b) Explain construction and working of solar water heater.

c) State various types of energy losses with their control measures in any utility.

d) Explain any four important properties of petroleum fuel.

4. Attempt any THREE of the following: **12**

a) Illustrate the benefits of hydrogen energy as a future energy.

b) List the advantages and disadvantages of hydropower. (four each)

c) Outline any four duties and responsibilities of energy manager.

d) Explain the procedure of detailed energy audit.

e) A chemical plant is using 1200 kg of conventional solid fuel per hour having calorific value 9800 kcal/kg for a boiler. A boiler fuel is switched to biomass based solid fuel having calorific value 7200 kcal/kg. The conventional solid fuel costs ₹ 20 per kg and the biomass based solid fuel costs ₹ 11 per kg. Calculate percentage saving in fuel cost.

Marks

5. Attempt any TWO of the following: **12**

a) Describe the concept of fixed cost, variable cost and total cost.

b) Explain law of demand and law of supply.

c) Calculate the total amount available after 10 years from now if ₹ 20000 is deposited at the present time with nominal interest at the rate of six percent compounded semi-annually.

6. Attempt any TWO of the following: **12**

a) Outline the process of accounting.

b) An equipment with an original cost of ₹ 15 lakhs and no salvage value has a depreciation charges of ₹ 3.15 lakh during its second year of service when depreciated by the sum-of-digits method. Find its expected useful life.

c) A proposed chemical plant will require a fixed capital investment of ₹ 15 crore. It is estimated that the working capital will amount to 20 percent of the total investment and annual depreciation cost is estimated to be 8 percent of the fixed capital investment. If the annual profit will be ₹ 7 crore, Calculate the minimum payout period.

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