22312

23242

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) Classify energy sources on the basis of price. Give example of each type.

b) List any four types of biomass which can be used as energy source.

c) Define calorific value and give its unit.

d) List any four types of cost.

e) Give the formula for compound interest and name each term.

f) Differentiate between primary and secondary energy sources.

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

a) Explain energy policy for chemical plant.

b) State benefits and problems of wind energy system.

c) List any four energy audit instruments and give its use.

d) Explain straight line method of depreciation.

P.T.O.

Marks

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

a) Explain the term Net Calorific Value (NCV) and Gross Calorific Value (GCV).

b) A reboiler of column consumes 35 MW of energy fluid enter into column at 80°C and leaves at 110°C in vapour form. Calculate fuel required per day Cp = 0.850 kJ/kg K.

Latent heat of vaporisation = 394 kJ/kg

B.P. = 110°C

c) Explain the working of biogas plant with a neat sketch.

d) Explain importance of national energy security.

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

a) Explain any four important properties of liquid fuel.

b) Explain working of solar water heater with diagram.

c) Explain concept of geothermal energy power plant with block diagram.

d) Explain procedure of detailed energy audit.

e) Write any four salient features of energy conservation Act-2001.

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

a) Explain the structure of balance sheet. Give any six components of it.

b) Describe concept of excise tax and income tax.

c) Calculate total amount payable after 5 years on principle amount of Rs. 5,00,000. Interest rate is 8% compounded annually. Also calculate if interest is simple interest rate for same amount.

Marks

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

a) Sketch tree diagram showing cash flow for chemical industrial operation.

b) A boiler is having cost of Rs. 50 lakh is installed in utility section of chemical plant. Its service life is 15 years. Selvage value is Rs. 2 lakh. Calculate depreciation value for 5^{th} year using.

i) Straight line method

ii) Sinking fund method

c) Explain rate of return on investment method. If a chemical plant is having profit of Rs. 50 lakh on investment of Rs. 3 crores. Calculate rate of return an investment.
