

Total No. of Questions : 8]

SEAT No. :

PD4713

[Total No. of Pages : 2

[6404]-219

B.E. (Mechanical)

ENERGY AUDIT AND MANAGEMENT

(2019 Pattern) (Semester - VIII) (402050B) (Elective - V)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q. 2, Q. 3 or Q. 4, Q.5 or Q. 6, Q. 7 or Q. 8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary.

Q1) a) An industry intends to invest INR. 5,00,000 in a new energy-saving project. The cash flows expected are: Year 1: Rs.2,00,000 Year 2: Rs.3,00,000 Year 3: Rs.2,00,000 The expected return is 10%. Evaluate the Net Present Value and comment on the feasibility of the project. [7]

b) Perform detailed analysis of the cost calculation of coal, natural gas, steam and electricity. [10]

OR

Q2) a) Explain various methods of financial analysis techniques used for proposal appraisal. [10]

b) Explain the 'Simple Payback Period' method of financial analysis with its advantages and limitations. [7]

Q3) a) How the performance of the cooling tower is specified? Discuss factors affecting the performance of cooling towers. [10]

b) The pump is used in HVAC applications with a rated power absorbing capacity of 200 KW and delivers 0.20 m³/sec. The suction and delivery head is 80 m and motor efficiency is 85%. Calculate pump efficiency assuming standard water density. [8]

OR

P.T.O.

- Q4) a)** Enlist the types of steam traps and explain any two with a neat sketch. [10]
- b)** Explain the energy-saving opportunities in the compressed air system. [8]

- Q5) a)** Discuss essential components of electric tariffs and explain any two tariff methods. [10]
- b)** Discuss causes of transmission and distribution losses in electric power transmission and suggest methods to eliminate them. [7]

OR

- Q6) a)** Discuss factors influencing the selection of induction motor. [10]
- b)** The showroom of two-wheeler utilizes, 15 bulbs each of 60W and 10 fluorescent tubes of 40W each, and a refrigerator of 500W. It is decided to replace bulbs and tubes with 15 CFL with 35 W each and an efficient refrigerator with power 200 W. Find savings in KWh and amount of rupee saved if the showroom runs 10 hours per day and an electric tariff of 8 INR is applicable. [7]

- Q7) a)** Write a short note on Trigenation and write its advantages. [10]
- b)** What is the need of cogeneration? Explain cogeneration in detail with suitable examples. [8]

OR

- Q8) a)** Explain carbon credit calculation for thermal power plant. [10]
- b)** Explain the Waste Heat Recovery (WHR) in the industry and write its direct and indirect benefits. [8]

