

Total No. of Questions : 8]

SEAT No. :

P-2865

[Total No. of Pages : 2

[6004]-619

**B.E. (Mechanical Engineering)**

**ENERGY AUDIT AND MANAGEMENT**

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

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8*
- 2) *Figures to the right side indicate full marks.*
- 3) *Use of Calculator is allowed.*
- 4) *Assume Suitable data if necessary.*

- Q1)** a) Explain 'Simple Payback Period' method of financial analysis with its advantages and limitation. [6]
- b) Explain the term Time Value of Money. [6]
- c) Explain various types of cash flows for an investment. [5]

OR

- Q2)** a) Describe the factors influencing costing of steam, compressed air, natural gas and Electricity. [8]
- b) A sum of Rs. 4,00,000/- is deposited in a bank at the beginning of a year. The bank pays 5% interest annually. How much money is in the bank account at the end of tenth year, if no money is withdrawn? [5]
- c) Write Notes on Return on Investment. [4]

- Q3)** a) Explain the energy saving opportunities in the compressed air system. [8]
- b) A centrifugal pump is pumping 85 m<sup>3</sup>/hr. of water and pressure rise in the pump is 6 kg/cm<sup>2</sup>. If power drawn by motor is 25KW. Find out the pump efficiency. Assume motor efficiency as 90% & water density as 998 Kg/m<sup>3</sup>. [10]

OR

**P.T.O.**

**Q4) a)** Enlist the types of stream traps and explain any two with a neat sketch. [8]

b) Calculate pump efficiency from the data given : pump flow is  $0.40 \text{ m}^3/\text{s}$ , power absorbed : 325 KW, suction head+1m, Delivery head 55m, motor efficiency 88%, type of drive: direct coupled, density of water  $996 \text{ kg}/\text{m}^3$ . [10]

**Q5) a)** What are advantages of power factor (PF) improvement in electrical system? Explain how PF is improved? [10]

b) Explain various energy saving opportunities in electrical system? [8]

OR

**Q6) a)** List the types of motors and explain different losses occurring in electric motors. [8]

b) Explain the following terms in brief : [10]

i) Lux

ii) Colour rendering index

iii) Ballast

iv) Luminance

v) Luminous efficiency

**Q7) a)** Explain the various types of recuperators with schematic sketch. [9]

b) What are benefits of waste heat recovery? Explain the concept of heat wheel. [8]

OR

**Q8) a)** How does a shell and tubes heat exchanger work? Give typical examples. [8]

b) Write notes on : [9]

i) Heat wheel

ii) Heat pipes

