



# 17559

11718

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) *All questions are compulsory.*
  - (2) *Illustrate your answers with neat sketches wherever necessary.*
  - (3) *Figures to the **right** indicate **full** marks.*
  - (4) *Assume suitable data, if **necessary**.*
  - (5) *Mobile Phone, Pager and any other Electronic Communication devices are **not** permissible in Examination Hall.*

**Marks**

1. A) Attempt **any three** of the following : **12**
- i) Explain energy conservation and state its importance.
  - ii) How Lux meter used in energy audit ?
  - iii) Define power factor. Write its formula.
  - iv) List out energy saving opportunities in boiler.
- B) Attempt **any one** of the following : **6**
- i) Explain how electricity is generated in thermal power plant with block diagram.
  - ii) Explain 3 T's of combustion.
2. Attempt **any four** of the following : **16**
- a) Write structure of energy audit report.
  - b) Write the salient features of Energy Conservation Act, 2001.
  - c) Explain need of energy audit in industry.
  - d) Explain wind mill with neat sketch.
  - e) Give types of heat exchanger by construction and flow.
3. Attempt **any four** of the following : **16**
- a) Explain construction and working of cooling tower.
  - b) Explain boiler efficiency calculation by direct method.
  - c) Draw a neat sketch of shell and tube heat exchanger.
  - d) Explain performance assessment of pump.
  - e) Explain working of bio gas plant with neat sketch.

**P.T.O.**

**Marks**

- 4. A) Attempt **any three** of the following :** **12**
- i) Explain energy scenario in India.
  - ii) State eight energy benchmarking parameters.
  - iii) Give the advantages and disadvantages of direct method for boiler efficiency calculation.
  - iv) Explain the effect of speed variation and impeller trimming in the pump.
- B) Attempt **any one** of the following :** **6**
- i) Explain the following type of energies are produced
    - a) Wave and tidal energy
    - b) Geothermal energy.
  - ii) Write steps for performance assessment of cooling tower.
- 5. Attempt **any two** of the following :** **16**
- a) Describe preliminary and detailed energy audit.
  - b) Define NPSH. List out any eight energy saving opportunities in cooling tower.
  - c) Explain features of perform achieve and trade-PAT scheme.
- 6. Attempt **any two** of the following :** **16**
- a) Describe construction and working of flat plate solar collector.
  - b) Explain construction and working of box type parabolic solar cooker.
  - c) Define specific heat and latent heat. A three phase motor with rated voltage 440 V and power 1.85 kW draws current of 2.4A. Calculate power factor.
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