



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.*

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| 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 3T'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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