

22525

23242

3 Hours / 70 Marks

Seat No.

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- 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) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) 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) Define energy conservation.
- (b) List the energy conservation techniques in induction motor.
- (c) List out various energy conservation equipments.
- (d) State the advantages of adoption of cogeneration system in an industry.
- (e) Define Energy Audit.
- (f) List any two advantages of MEDA.
- (g) Define peak off day tariff.

2. Attempt any THREE of the following :

12

- (a) List out the main features of Energy Conservation Act, 2001.
- (b) Explain the Energy Conservation technique of induction motor by improving power quality.



- (c) Explain the following energy conservation techniques :
 - (i) Controlling I^2R losses
 - (ii) Balancing phase current
- (d) State different types of tariff & explain any one.

3. Attempt any THREE of the following :

12

- (a) Describe the following energy conservation techniques used to improve performance of transformer :
 - (i) Parallel operation
 - (ii) Isolating technique
- (b) Explain different methods of energy conservation lighting system.
- (c) What is Sankey diagram ? State its significance from energy audit point of view.
- (d) State the need and benefits of star labelling.

4. Attempt any THREE of the following :

12

- (a) Explain the working principle of automatic power factor controller.
- (b) Explain any two energy conservation techniques in fan.
- (c) Define the following terms :
 - (i) connected load
 - (ii) maximum demand
 - (iii) average load
 - (iv) load factor
- (d) Explain the “Mitigation of Power theft” and “Faulty meter replacement” for energy conservation techniques to reduce commercial losses.
- (e) Define simple payback period and explain the procedure to calculate payback period. Also state its significance.

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

- (a)
 - (i) State the significant features of energy efficient motors.
 - (ii) Describe variable frequency drive with suitable diagram.
- (b) For the tariff of ₹ 125/KVA of maximum demand and ₹ 1 Per unit consumed, load factor 50%. Find overall cost at (i) unity pf. (ii) 0.8 pf.

Consider maximum demand = 1 KVA.
- (c) Explain stepwise the “Detailed Energy Audit Procedure” to be carried out for an organization.

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

- (a) List different commercial losses in transmission and distribution system. State its causes and remedies.
 - (b) Explain with diagram :
 - (i) Topping cycle type of cogeneration.
 - (ii) Bottoming type of cogeneration
 - (c) State the difference between “walk through audit” and “detailed audit”. Write stepwise procedure for detailed audit.
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