

22525

12526

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

-
- 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) State the full form of BEE and MEDA.
- b) List out any four energy conservation techniques applicable to induction motor.
- c) Interpret the Aggregated Technical and Commercial losses (ATC) in power system at state level.
- d) Define Energy Audit as per Energy Conservation Act 2001.
- e) List any four types of tariff.
- f) Explain the National Scenario related to Energy demand and supply.
- g) State the need of energy conservation in case of induction motors.

P.T.O.

- 2. Attempt any THREE of the following : 12**
- a) List out main features of Energy conservation Act 2001.
 - b) Illustrate energy conservation in motor by load matching and operating in star mode.
 - c) Explain the technical and commercial losses in power system.
 - d) Explain : Payback period and detailed audit in relevance to energy efficiency.
- 3. Attempt any THREE of the following : 12**
- a) State any four advantages of amorphous core transformer.
 - b) State the working principle and operation of automatic power factor controller used in transmission and distribution system.
 - c) List any four merits of cogeneration.
 - d) State the difference between “walk through audit” and “detailed audit”.
- 4. Attempt any THREE of the following : 12**
- a) Distinguish between Energy conservation and Energy Audit.
 - b) State the various energy conservation techniques used in lighting system. Explain any one of it.
 - c) Describe why energy conservation technique should be adopted in transformer even though its efficiency is mostly more than 90%.
 - d) Explain any two energy conservation techniques used in fan.
 - e) Explain energy flow diagram? State its significance from energy audit point of view.

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

- a) Describe the following energy conservation technique used to improve the performance to transformer.
- i) Load sharing
 - ii) Parallel operation
 - iii) Isolating Technique
- b) Explain with flow chart the energy audit procedure.
- c) For the tariff of Rs. 125/kVA of maximum demand and Rs. 3.00 per unit consumed, load factor = 50% find overall cost/unit at
- i) unity power factor
 - ii) 0.8 p.f. consider maximum demand = 10 kVA.

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

- a) Explain the following energy conservation technique.
- i) controlling I^2R losses.
 - ii) Balancing phase current
- b) An industrial plant has incandescent lighting load of comprising 100 numbers of 60w and 140 numbers of 100w. Calculate the energy saving and simple payback period if each incandescent load is replaced by 1×40 w flurosent lighting load. Lighting is required for 4000 hrs/year and cost of electricity is Rs. 6.00/Kwh. Replacement cost is 150/unit. Consider ballast consumption as 15 watt. Given data.
- i) 100 w incandescent lamp = 2200 lumens.
 - ii) 60 w incandescent lamp = 1320 lumens
 - iii) 40 w flurosent lamp = 2400 lumens.
- c) Explain with diagram
- i) Topping cycle type of cogeneration
 - ii) Bottoming type of cogeneration
-