11718

3 Hours / 100 Marks Seat No. | | | | | | | | |

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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) 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 the need of energy conservation in present scenario.

(ii) Explain the energy conservation technique adopted in lighting system by

(a) using most efficient luminaries.

(b) using light controlled gears.

(iii) Compare energy efficient motor with standard motor on the basis of

(a) Starting torque

(b) Construction

(c) Energy conservation

(d) Efficiency

(iv) Explain the following energy conservation methods of electrical motor :

(a) Rewinding of motor

(b) Operating in star mode.

(B) Attempt any ONE of the following : **6**

(i) State any six instruments used in energy audit procedure with their functions.

(ii) (a) Explain the necessity of energy conservation in Electrical motors.

(b) Explain energy conservation technique in induction motor by improving mechanical power and transmission efficiency.

2. Attempt any FOUR of the following : **16**

(a) State the recommended illumination level for each of the following situation.

(i) Living room (ii) Workshop

(iii) Godown (iv) Kitchen

(b) State salient features of Energy Conservation Act, 2003.

(c) Define the terms :

(i) Lamp efficiency (ii) Luminous flux

(iii) Lminaire (iv) Colour Rendering Index.

(d) Explain energy conservation method in induction motor by improving power quality.

(e) State and explain the features of amorphous core transformers which results into energy conservation.

(f) Discuss how optimization of system voltage and balancing of phase current results into conservation of energy in transmission and distribution system.

3. Attempt any FOUR of the following : **16**

(a) Write any four objectives of tariff system.

(b) State commercial losses in transmission and distribution system. Also state the remedies for same.

(c) For the tariff of ₹ 125/KVA of maximum demand and 10 paise per unit consumed; load factor = 50%. Find overall cost/unit at (i) unity P.F., (ii) 0.8 P.F. Consider max demand = 1 KVA.

(d) Draw and explain power flow diagram of induction motor.

(e) State the opportunities for energy conservation techniques in transformer.

(f) Write any four merits of co-generation system.

4. (A) Attempt any THREE of the following : **12**

(i) Explain the role of adequate maintenance of lighting system in energy conservation.

(ii) Explain parallel operation of the transformer in context of energy conservation.

(iii) Explain reactive power compensation in Transmission and Distribution system.

(iv) State two benefits and applications of variable frequency drives.

(B) Attempt any ONE of the following : **6**

(i) State the need of energy conservation equipments. Draw block diagram of microprocessor based centralized control equipment of energy conservation and explain it.

(ii) Explain with flow chart the energy audit procedure.

5. Attempt any FOUR of the following : **16**

(a) Give classification of co-generation system on the basis of the use of technology.

(b) Explain scenario of transmission and distribution losses at national level.

(c) State ABC analysis related to energy audit.

(d) Compare soft starter with conventional starter (any four point).

(e) With diagram, explain bottoming cycle type of co-generation.

(f) Define the terms :

(i) Tariff (ii) Fuel surcharge

(iii) Electricity duty (iv) Connected load

6. Attempt any FOUR of the following : **16**

(a) Discuss how power factor tariff results into energy conservation.

(b) State name of eight industries suitable for co-generation of energy.

(c) Draw and explain bulk correction method for power factor & control.

(d) State the different types of tariffs. Explain any one.

(e) Discuss the role of replacement of old lamps by new more energy efficient lamps in the conservation of energy.