

914 (i) / PEMS141 - Elective-I : Energy Conservation

P. Pages : 2

Time : Three Hours



GUG/W/18/10951

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Solve **any five** question.
 3. Due credit will be given to neatness and adequate dimensions.
 4. Assume suitable data wherever necessary.
 5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) Explain in detail about Energy Conservation Planning. **6**
b) An industrial consumer has an annual energy consumption of 201500 kWh at a load factor of 0.35. The tariff is Rs. 4000 + Rs. 1200 per kW of maximum demand + Rs. 2.20 per kWh.
i) Find his annual bill.
ii) What is the bill if total energy consumption is the same but load factor improved to 0.55?
iii) What is the bill if energy consumption is reduced by 25% and load factor remains at the same initial value of 0.35?
iv) Find average energy cost in each case. **8**
2. a) Discuss some energy conservation measures for household and commercial sectors. **7**
b) How DSM has been implemented in the different countries of the world? What is the level of success? **7**
3. a) Compare the advantages and disadvantages of using synchronous condenser and capacitor for power factor improvement. **7**
b) Explain the importance of energy conservation in electrical drives. **7**
4. a) Explain in detail street lighting by clearly mentioning its main objectives, general principles and factors to be considered while designing it. **6**
b) What is photometry? Which are the various photometer heads? Explain Bunsen head in detail. **8**
5. a) It is desired to illuminate a drawing hall with an average illumination of about 250 lux. The area of the hall is 30m x 20m. The lamps are to be fitted at 5m height. Find out the number and size of incandescent lamps required for an efficiency of 12 lumens/watt, Utilisation factor = 0.4 and maintenance factor = 0.85. **8**
b) Which are the various causes of losses in steam turbines? Mention the preventive measures to be taken to reduce them. **6**

6. a) Discuss the other uses than power generation of water heat recovery in detail. 6
- b) Explain in brief the following. 8
- i) What do you mean by system related with work and heat? Define the various types of systems.
- ii) What is the qualitative difference between heat and work?
- iii) What is the standard fixed point in thermometry? Define it.
- iv) State and explain second law of thermodynamic.
7. a) Write the importance of predictive and preventive maintenance in energy conservation. 8
- b) Explain with neat diagram hyperbolic cooling tower. Discuss its merits and demerits. 6
8. a) Explain the mechanism of evaporative cooling. When spray cooling ponds are preferred compared with cooling tower? Explain spray cooling pond. 7
- b) How turbines are classified? Explain the difference between impulse and reaction turbine. 7
