

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022**POWER SYSTEMS****(2021 Scheme)****Course Code: 21PS206-A****Course Name: Industrial Energy Conservation and Management****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Define i) Energy Conservation ii) Energy Management.
2. What are the techniques for peak demand control?
3. Define percentage loading of motor. List down various methods available for determination of percentage loading of an induction motor.
4. Define EER. What is the importance of EER?
5. Explain the working principle of impulse steam turbine.
6. What are the functions of a pump?
7. Explain the principle of cogeneration.
8. What are the implementation issues of DSM?

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. Differentiate between energy strategy, energy policy and energy planning. (6)

OR

10. Explain the different components of an energy audit report. (6)

MODULE II

11. Describe the energy management principles applied to electrical loads. (6)

OR

12. Explain the energy management opportunities for electrical heating systems. (6)

MODULE III

13. With the help of neat diagram, explain 'On Load Tap Changer' in transformers. (6)

OR

14. Estimate the percentage loading of the induction motor with following data using input power method, line current method and slip method: Rated KW of motor=30 kW, Rated Amps=55 A, Rated voltage=415 V, Name plate efficiency= 92%, Name plate speed = 1440 rpm, No. of poles=4, Frequency=50 Hz. (6)
- Operating Data:
Measured speed=1460 rpm, Input load current=45 A, Operating voltage=425 V, Input power=20 kW.

MODULE IV

15. Explain the components of psychometric chart. (6)

OR

16. Describe the electrical energy conservation techniques in refrigeration systems. (6)

MODULE V

17. Explain the energy efficiency opportunities in pumps. (6)

OR

18. A Pelton wheel having semi-circular buckets functions under a head of 150 m and consumes $0.06 \text{ m}^3/\text{s}$ of water. If 750 mm diameter wheel turns 800 rpm, calculate the power available at the nozzle and hydraulic efficiency of the wheel. Assume the coefficient of velocity as unity. (6)

MODULE VI

19. Describe the feasibility study for cogeneration. (6)

OR

20. Define payback period. Explain the advantages and disadvantages of payback period. (6)
