

MAHARASHTRA ANIMAL AND FISHERY SCIENCES UNIVERSITY, NAGPUR
SEMESTER END THEORY EXAMINATION, B.Tech. (D.T.)

Semester	: VI (V Dean)	Academic Year	: 2021-2022
Course No.	: DE- 615	Course Title	: Energy Conservation and Management
Credits	: 1+1=2	Total Marks	: 50
Day & Date	: Monday, 23/05/2022	Time	: 2.30 hrs.

- Note :**
- 1) All questions from **Section 'A'** are compulsory.
 - 2) Solve **Any Three** questions from **Section 'B'**.
 - 3) Draw neat and well labelled diagram wherever necessary.

SECTION – 'A'

Q. 1 A) Choose the most appropriate answer from the options given below: (05)

- i) Power factor (PF) is the ratio of
 - a) Apparent power and Active power
 - b) Active power and Reactive Power
 - c) Active Power and Apparent power
 - d) Apparent power and Reactive power
- ii) The energy consumed by a 50 kW motor loaded at 40 kW over a period of 4 hours is
 - a) 50 kWh
 - b) 160 kWh
 - c) 40 kWh
 - d) 2000 kWh
- iii) The latent heat of condensation of 1 kg of steam at 100 °C to form water at 100 °C, it gives out the heat of
 - a) 580 kcal
 - b) 540 kcal
 - c) 620 kcal
 - d) 2260 kcal
- iv) Which of the following is the predominant loss in a furnace oil fired boiler?
 - a) dry flue gas losses
 - b) heat loss due to moisture in air
 - c) heat loss due to radiation and convection
 - d) heat loss due to moisture in fuel
- v) Which one is a secondary form of energy?
 - a) Furnace Oil
 - b) Natural Gas
 - c) Electricity
 - d) Coal

B) Define the following. (05)

- i) Load Factor
- ii) Energy audit
- iii) Plant energy performance
- iv) Energy Efficiency Ratio
- v) Demand Factor

Q. 2 A) Give the reasons for the following. (05)

- i) How soft starters are helpful in extending life of motor?
- ii) Why thermic fluid is used in certain application instead of steam?
- iii) Why expansion loops are provided in steam lines?
- iv) How can you identify leaking steam and flash steam?
- v) Why capacitors are provided to power distribution system?

(P.T.O.)

- B) State whether the following statements are True or False. If false, rewrite the statement after making necessary corrections. (05)
- Material and energy balance will identify areas to concentrate for energy conservation.
 - The criteria for heat transfer are the difference in pressure between hot and cold fluid.
 - Economizer in the boiler is used to extract heat from the flue gases.
 - Boiler efficiency = (Heat input / Heat output) x 100.
 - Fouling factor increases with increased fouling and effectiveness of heat exchanger decreases.

SECTION –‘B’

- Q. 3 A) What is concept of Co-generation and give the benefits of co-generation and factors influencing cogeneration choice. (05)
 B) Enlist the different renewable energy resources and explain any one in detail. (05)
- Q. 4 A) State the need for energy audit and explain different types of energy audits. (05)
 B) Explain briefly about commercial waste heat recovery devices? (05)
- Q. 5 A) Describe the merits of using steam in dairy industries. (03)
 B) List steps involved in ‘detailed energy audit’. (03)
 C) Explain the power saving guide with “Star Ratings” of electrical appliances. (04)
- Q. 6 A) Discuss the energy conservation act 2001. (03)
 B) What are the principles of energy management? (03)
 C) Discuss the role of energy Inspector and Auditor in energy management. (04)
- Q. 7 A consumer has the following connected load : 10 lamps of 60W each and two heaters of 1000W each. His maximum demand is 1500W. On an average, he uses 8 lamp for 5 hours per day and each heaters for 8 hours a day. Find his total load and monthly energy consumption. (10)
