Enrollment No: _____ Exam Seat No: _____

C. U. SHAH UNIVERSITY

Summer Examination- 2022

Subject Name: Energy Conservation and Audit

Subject Code: 4TE08ECA1 Branch: B.Tech (Mechanical)

Semester: 8 Date: 02/05/2022 Time: 11:00 To 02:00 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

(a) The ratio of maximum demand to the connected load is termed as
(a) Load factor (b) Demand factor (c) Contract Demand (d) None of the above

(b) The objective of energy management includes
(a) Minimizing energy costs (b) Minimizing waste
(c) Minimizing environmental degradation (d) All of these

(c) Which of these is conservation of energy?
(a) Reduction of wastage of energy
(b) Reduction of a percentage of energy consumption
(c) Reduction of energy consumption
(d) All of these

(d) Which is the most economical way of increasing the light output from a lamp?
(a) Replace the light with a new one
(b) Replace with a more powerful light
(c) Clean the light surface
(d) None of these

(e) The percentage of energy saved at the current rate of use, compared to the reference year rate of use, is called
(a) Energy Utilization (b) Energy Performance
(c) Energy Efficiency (d) None

(f) The tool used for performance assessment and logical evaluation of avenues for improvement in Energy management and audit is
(a) Fuel substitution (b) Monitoring and verification
(c) Energy pricing (d) Bench marking

(g) The energy manager has to perform the function of _____.
1. Organizer, 2. Planner, 3. Decision maker and 4. Team leader
(a) 1, 2 and 3 (b) 1and 2 only (c) 1, 2 and 4 (d) All of these

(h) The location of energy manager in a large organization could be
(a) Marketing division(b) Plant maintenance unit
(c) Corporate management services department(d) Finance division

(i) In material balance of a process, material for recycle is always considered as _____
(a) Input to process (b) Output to process(c) Both (a) and (b)(d) None of them

(j) To draw a CUSUM chart following data is required
(a) Monthly energy consumption& monthly production
(b) Monthly specific energy consumption and turn over
(c) Monthly profits and production
(d) None

(k) One of the following is not the element of energy monitoring & targeting system
(a) Recording the energy consumption(b) Comparing the energy consumption
(c) Controlling the energy consumption(d) Reducing the production

(l) Which one of the following is a high temperature heat recovery device?
(a) Regenerator (b) Heat pump (c) Heat wheel (d) Heat pipe

(m) Which of these is co-generation?
(a) Power plant run by coal mill rejects.
(b) Power plant run by coal washery rejects.
(c) Power plant run by exhaust gas from gas turbine.
(d) Power plant run by pulverized coal.

(n) Recuperator is used mainly as a waste heat recovery system in a ____.
(a) Boiler (b) Billet Reheating Furnace (c) compressor (d) None of the above

Attempt any four questions from Q-2 to Q-8.

Q-2 **Attempt all questions**

(a) List the responsibilities and duties of an energy manager in an industry under The Energy Conservation Act, 2001. **(07)**

(b) What is clean diesel technology? What are the proposed redesigns in engine and exhaust systems of vehicles for clean diesel technology? **(07)**

Q-3 **Attempt all questions**

(a) What is the necessity of implementing energy management in a building? Explain with specific reasons. **(07)**

(b) An industry is having contract demand of *1000 kVA*. The minimum billing demand is *75%* of the contract demand. The connected load of the plant is *2000 kVA*. The recorded demand and power factor for the month of March *2003* is *1200 kVA* and *0.8*. The monthly consumption is *2.0* lakh units. The average load and maximum load of the industry is *700 kW* and *900 kW* respectively. Calculate *1*. Minimum billing demand of the industry *2*. Load factor of the plant *3*. Demand factor of the plant. **(07)**

Q-4 **Attempt all questions**

(a) What is plant energy performance? Write down the methods for improve energy performance. **(07)**

(b) How to Carryout Material and Energy (M&E) Balance? **(07)**

Q-5 **Attempt all questions**

(a) What is energy audit? Explain types of energy audit in detailed. **(07)**

(b) Draw a process flow chart for Pulp & Paper Industry. **(07)**

Q-6 **Attempt all questions**

(a) Define energy monitoring. State the benefits of energy monitoring. **(07)**

(b) What are the methods available for assessing the boiler efficiency and explain briefly? **(07)**

Q-7 **Attempt all questions**

(a) Prepare a list of measures for energy conservation in motors. **(07)**

(b) Explain how cogeneration is advantageous over conventional power plant. **(07)**

Q-8 **Attempt all questions**

(a) Explain bench marking in detail. **(07)**

(b) How will you go about developing a waste heat recovery system? **(07)**