Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEMESTER VII – EXAMINATION – WINTER 2014

Subject Code: 171907 **Date: 29/11/2014**

Subject Name: Energy conservation and management

Time: 10:30 AM TO 01:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Why energy conservation act is framed ? Explain the words 'standards and labeling' , 'Designated consumers' and 'BEE' with respect to this act. **07**

(b) Define energy security. Enlist different strategies to achieve it and discuss role of energy conservation to achieve energy security. **07**

Q.2 **(a)** Discuss following: **07**

i) Commercial and Noncommercial energy

ii) Renewable and Nonrenewable energy

(b) Define following terms and write SI units: **07**

i) Relative density

ii) Power factor

iii) Higher calorific value

iv) Latent heat of sublimation

OR

(b) Solve following: **07**

i) 5 kg of steam at 100 ^{0}C with latent heat of vaporization 2260 kJ is cooled to 20 ^{0}C.If the specific heat of water is 4200 J/kg K, find the quantity of heat given out.

ii) Power consumption of electric heater is 5kWh what will be equivalent kilocalorie and British Thermal Unit (BTU).

Q.3 **(a)** Define energy audit. Identify it needs and discuss second phase of detailed energy audit. **07**

(b) Enlist different financial analysis techniques used in energy management. Explain Simple payback period and present value of money method. **07**

OR

Q.3 **(a)** "Energy conservation in an industry is driven by energy audit ", Justify the following statement. **07**

(b) What do you understand by ESCOs and Performance contracts ? Explain in brief. **07**

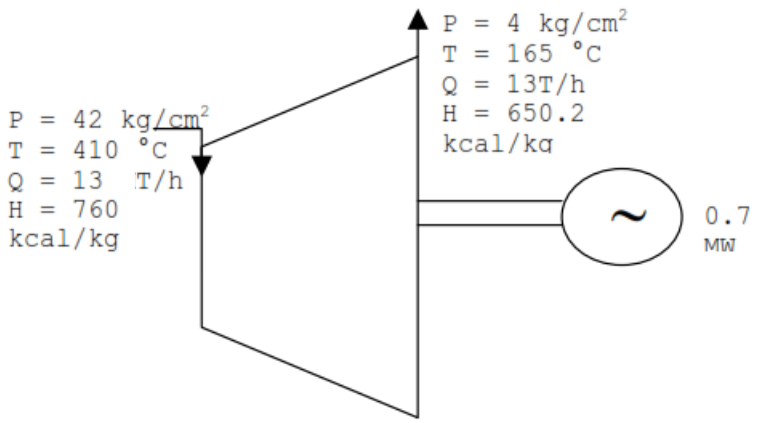
Q.4 **(a)** What is the difference between monitoring and targeting ? Explain briefly essential elements of monitoring and targeting system and benefits of this system. **07**

(b) Write major steps to convert conventional stoker fire boiler to fluidized bed combustor and Explain at least four advantages of fluidized bed boiler. **07**

OR

Q.4 **(a)** What is Cogeneration ? Enlist four types of topping cycle cogeneration and discuss one with neat sketch. **07**

(b) **07**



Find the cogeneration efficiency based on mentioned figure. P,T,Q and H represent pressure, temperature,mass flow rate and specific enthalpy respectively.

Q.5 **(a)** How do you assess the performance of fans ? Explain. **07**

(b) What are the disadvantages of 'direct method' of boiler efficiency evaluation over 'indirect method'? Explain procedure to calculate boiler efficiency using 'indirect method' **07**

OR

Q.5 **(a)** List down energy conservation opportunities in pumping system. **07**

(b) What are the characteristics of an Efficient Furnace? Write the formula for evaluating the thermal efficiency by direct method. **07**

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