

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEMESTER VII – EXAMINATION – WINTER 2014

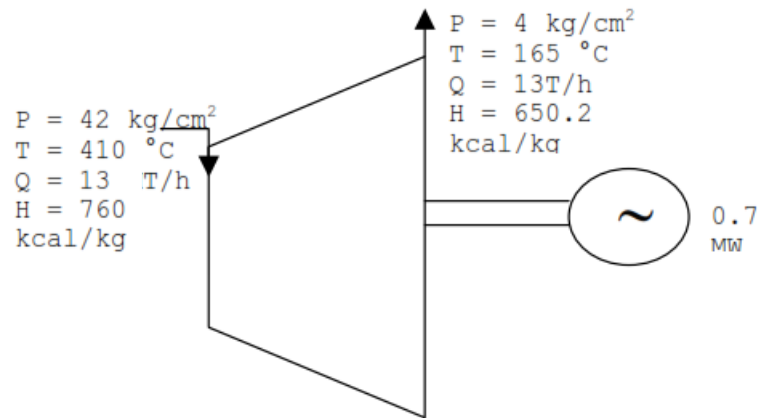
Subject Code: 171907**Date: 29/11/2014****Subject Name: Energy conservation and management****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

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 °C with latent heat of vaporization 2260 kJ is cooled to 20 °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 its 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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