Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E –Ist SEMESTER–EXAMINATION – JULY- 2012

Subject code: 710706N **Date: 13/07/2012**

Subject Name: Energy management

Time: 2:30 pm – 05:00 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) Differentiate between energy conservation and energy efficiency. What are the benefits for industry through implementing energy efficiency programme? **07**

(b) What are the various steps in the implementation of energy management in an organization? Explain the role of training and awareness in energy management programme? **07**

Q.2

(a) **07**

(1) A 15 KW rated electric motor pump raises 500kg water through a height of 80 m to an overhead tank. Motor efficiency is 80%. Calculate: (1) Time required (2) energy consumed from mains supply (3) Potential energy acquired by water.

2) A battery driven electric motor drives a cart, it has rated output of 60 KW and moves at a velocity of 16 km/hr on horizontal road. Loses are neglected. What is (1) the force of the vehicle. (2) energy transformed in 1 hour. (3) work done (4) energy chain.

(b) What is an energy audit? How energy audit helps in energy management? **07**

OR

(b) Prepare a report of energy audit of any industry you visited. **07**

Q.3

(a) Describe the greenhouse effect. Name three greenhouse gases. Which one of them produces the maximum greenhouse effect? **07**

(b) Explain the key features of energy information system. Taking your own industry as an example. **07**

OR

Q.3 (a) Prepare a report of energy audit for an illumination system in a shop floor of a factory.Assume suitable data for working area requiments of illumination level as per standard. **07**

(b) What are the causes of low power factor? State advantages of improving power factor. Describe any method to improve power factor in a substation of a bulk consumer. **07**

Q.4

(a) What is the difference between proximate and ultimate analysis of coal? What is the effect of fines on coal combustion and how to overcome them? **07**

(b) Name three factors affecting the boiler efficiency and explain briefly. **07**

OR

Q. 4 (a) List the five energy conservation measures in improving the boiler efficiency without investment. **07**

(b) List down the responsibility and duties of an energy manager in industry. **07**

Q.5

(a) Explain how cogeneration is advantageous over conventional power plant. List the circumstances under which cogeneration will become attractive. **07**

(b) Explain how you will go about an energy audit of a steam turbine based fully back pressure cogeneration system. **07**

OR

Q.5 (a) Explain with diagrams cogeneration systems using back pressure turbine, extraction-condensing turbine and double extraction back pressure turbine. **07**

(b) How will you go about developing a waste heat recovery system? Explain the operating principle of a heat pump with examples. **07**

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