B.Tech. - VIEP - ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

June, 2019

BIEE-026 : ENERGY AUDITING AND ANALYSIS

00535

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions.*

*(ii) Each question carries **equal** marks.*

(iii) Use of scientific calculator is allowed.

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1. With neat sketches, explain the functions of following energy auditing instruments : **2x5=10**

(a) Infrared thermometer

(b) Gas analyser

2. Figure 1 shows the single line diagram having 100 kW heater and 200 kW motor, which is at 200 m away from 415 V, LT bus using suitable cable. The main incoming p.f. of system is 0.85 (lagging). Calculate the required KVA_r to improve p.f. of system to 0.9 (lagging). **10**

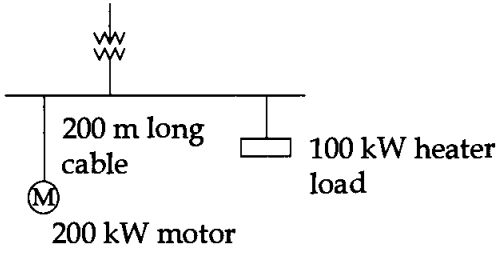

Figure 1

3. Explain the different monitoring and control processes used during energy accounting. 10

4. (a) How can 'good lighting distribution' be achieved in industrial lighting schemes ? 5
   (b) Describe the step by step methodology of lighting system audit in an industry. 5

5. (a) What is an energy efficient motor ? How is it different from a standard motor ? 5
   (b) Write the checklist of good maintenance practice for proper motor operation. 5

6. What is a variable speed drives ? How over sizing affects the performance of a drive ? (Focus your answer in context with energy efficiency.) 10

7. (a) What is the function of a condenser in a refrigeration cycle ? 3
   (b) Ice is formed at 0°C from water at 30°C. In the refrigeration system, same temperature water is used for condenser cooling and the temperature of the brine is $-15°C$ at evaporator. For an ideal system, find COP of the refrigeration system. 7

8. Discuss the energy conservation measures in electrolytic process industry. Prepare a schedule for different energy conservation measures. 10

9. Write short notes on **any two** of the following : **2x5=10**
   (a) Eco assessment and evaluation methods
   (b) Feeder loss evaluation
   (c) Efficient control strategies for pumps