Total number of printed pages:5 **PG/2nd/PGET201**

2021

ENERGY MANAGEMENT AND AUDITING

Full Marks: 60

Time: 2 hours

The figures in the margin indicate full marks for the questions.

A. Multiple Choice Questions 1 x 20=20

1. "The judicious and effective use of energy to maximise profits and enhance competitive positions". This can be the definition of:
   a. Energy conservation
   b. Energy management
   c. Energy policy
   d. Energy audit
2. The objective of energy management includes
   a. Minimizing energy costs
   b. Minimizing waste
   c. Minimizing environmental degradation
   d. All the above
3. The benchmarking parameter for air conditioning equipment is
   a. kW/Ton of Refrigeration
   b. kW/ kg of refrigerant handled
   c. kcal/m3 of chilled water
   d. Differential temperature across chiller
4. Which instrument is used to monitor O2, CO in flue gas?
   a. Combustion analyzer
   b. Power analyzer
   c. Pyrometer
   d. Fyrite

5. An energy policy does not include
    a. Target energy consumption reduction
    b. Time period for reduction
    c. Declaration of top management commitment
    d. Future production projection
6. In the material balance of a process or unit operation process, which component will not be considered on the input side?
    a. Chemicals
    b. Water/Air
    c. Recycle
    d. By product
7. Losses in material and energy balance is considered as
    a. Inputs
    b. Outputs
    c. Both (a) and (b)
    d. None of the above
8. Sankey diagram shows in graphics ___.
    a. Energy input
    b. Energy output
    c. Energy balance
    d. All of the above
9. In a chemical process of two reactants A (200 kg) and B (200kg) is used as reactants. If conversion is 50% and A and B reacts in equal proportion then calculate the weight of the product formed.
    a. 150 kg
    b. 200 kg
    c. 250 kg
    d. 400 kg
10. Which one is a secondary form of energy?
    a. Furnace oil
    b. Natural gas
    c. Electricity

d. Coal

11. Sankey diagram is an useful tool to represent ____.

    a. financial strength of the company

    b. management philosophy

    c. input and output energy flow

    d. human resource strength of the company

12. The support for energy management is expressed in a formal written declaration of commitment. This is called

    a. Company policy

    b. Management policy

    c. Energy policy

    d. Energy efficiency policy

13. In force field analysis of energy action-planning, one of the actions below do not fall under positive force?

    a. High price of energy

    b. Energy efficiency technology available

    c. Top management commitment

    d. Lack of awareness

14. The location of energy manger in a large organisation could be

    a. Marketing division

    b. Plant maintenance unit

    c. Corporate Management Services Department

    d. Finance division

15. Providing information to BEE is the role of energy manager as per

    a. Energy Conservation Act 2004

    b. Energy Conservation Act 2003

    c. Energy Conservation Act 2002

    d. Energy Conservation Act 2001

16. The quantity of heat required to change 1 kg of the substance from liquid to vapor state without change of temperature is termed as

    a. Latent heat of fusion

    b. Latent heat of vaporization

c. Heat capacity

d. Sensible heat

17. Inexhaustible energy sources are known as

a. commercial Energy

b. renewable Energy

c. primary energy

d. secondary energy

18. Which fuel dominates the energy mix in Indian energy scenario?

a. Oil

b. Natural gas

c. Coal

d. Nuclear

19. Which of the following is highest contributor to the air pollution?

a. Carbon Monoxide

b. Hydrocarbons

c. Sulphur Oxides

d. Particulates

20 Acid rain is caused by the release of the following components from combustion of fuels.

a. SO_x and NO_x

b. SO_x and CO_2

c. CO_2 and NO_x

d. H_2O

B. Very Short Question 2*6=12

1. What are the principles of energy management?
2. What is the need for managerial skills in energy management?
3. What do you mean by energy audit?
4. List steps involved in pre-audit phase.
5. The successful energy management programme is possible with four vital elements. Name them?
6. Why Sankey diagram is useful in energy balance calculations?

C Short Question 4*7=28

1. Write a note on various forms of energy with examples.
2. Distinguish between ‘preliminary energy audit’ and ‘detailed energy audit’?
3. Draw a typical Sankey diagram of reheating furnace
4. What way material and energy balance study is useful for a Top management?
5. List down at least four responsibilities of an Energy Manager?
6. What are the vital elements for a successful energy management programme?
7. List steps involved in ‘detailed energy audit’.