

Seat
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DBI 1341

ELECTIVE - I

Energy Conservation & Management (New)

(1251)

P. Pages : 3

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Black figures to the right indicate full marks.
5. Assume suitable additional data, if required, giving proper justification.
6. All questions are compulsory and solve **any two** bitn out of a,b,c in each question.

UNIT - I

1. a) i) Explain Reserves to production ratio with its importance giving an example. 5
- ii) Following data is obtained from analysis of a boiler performance. Draw Sankey diagram. Heat losses through flue gases (after last heat exchanger) = 11 %
Heat recovery by economiser = 3%
Heat recovery by air pre heater = 3%
Heat losses due to moisture present in fuel = 2%
Heat losses due to moisture present in air = 1%
Heat losses due to water evaporation due to H₂ = 5%
Losses due to radiation and heat unaccounted = 2% 5
- b) Explain pay back period ? Derive an expression for pay back period. 10
- c) Explain in detail energy conservation and its importance. 10

UNIT - II

2. a) What is energy audit ? What are its main objectives ? 10

- b) i) List the strategies for better energy security of nation. 5
- ii) Compare and recommended on the basis of life cycle cost. 5

	ABC Compressor	PQR Compressor
Power consumption	147 kw	150 kw
Life of compressor	15 years	12 years
cost of compressor	15 lakhs	12 lakhs
Power cost	Rs. 5/- per kwh	Rs. 5/- per kwh
Operating hours	3000 hrs per day	3000 hrs per day

- c) Explain energy conservation act 2001 ? Also give its features. 10

UNIT - III

3. a) Calculate motor efficiency and power factor at full load with following data. 10

Rated power	50 kw
Voltage	415 V
Current	88 A
Speed	1445 rpm.
connection	Delta.
No. load test data.	
Voltage	415 V
Current	21A
Frequency	50Hz
Stator phase resistance of	$30^\circ = 0.27 \text{ ohms.}$
No load power	2350 watt.
Temp. at full load	120°C.

- b) i) Explain benefits of power factor improvement with example. 5
- ii) Describe crucial parameters while selecting lighting system. What type of lamps you will select for street lights. Why? 5
- c) i) Explain effect of speed variation and impeller diameter on head, discharge and power consumption of a pump. 5
- ii) Explain energy efficiency. 5

UNIT - IV

4. a) Explain major energy conservation measures in industrial fans and water system. **10**
- b) What is co-generation ? Explain its types. **10**
- c) Explain in detail energy conservation measures in refrigeration and air conditioning system. **10**

UNIT - V

5. a) State the steps in energy management to be established in a manufacturing company. **10**
- b) What are responsibilities and duties of Energy manager under Act 2001. **10**
- c) Write short notes on : **10**
- a) Energy policy.
- b) Motivation of Employees.
