Q.P. Code: 25977

3 hours **80 Marks**

N. B.:

1. Attempt any **FOUR Questions**.
2. Use illustrative diagrams wherever required.

Q1) Attempt any **FOUR**

	a)	Differentiate between energy conservation and energy efficiency.	**05**
	b)	Explain high grade and low grade energy giving examples.	**05**
	c)	Enlist any five energy audit instruments and respective measuring parameter?	**05**
	d)	Define simple payback period. Calculate SPP for an energy efficient motor that costs Rs. 1.5 lakh to purchase and install and is expected to save Rs. 0.75 lakh per annum?	**05**
	e)	What do you understand by the term ENCON? Give examples.	**05**
Q2)	**a)**	What do you mean by energy audit. What are the base line data that an audit team should collect while conducting detailed energy audit?	**10**
	b)	A 20 kW, 415V, 38A, 4 pole, 50 Hz, 3 phase rated squirrel cage induction motor has a full load efficiency and power factor of 88% and 0.85 respectively. An energy auditor measures the following operating data of the motor. Supply voltage= 408V, Current drawn= 30A, PF=0.83 Find out the following at motor operating conditions. 1) Power input in kW2) % motor loading	**10**
Q3)	**a)**	How does an energy auditor assess the performance of steam trap during energy audit?	**10**
	b)	i) Explain why dry saturated steam is preferred over wet or superheated steam for industrial process heating. ii) Why should one use dry saturated steam at the lowest possible pressure for indirect steam heating?	**10**
Q4)	**a)**	What do you mean by kW/TR pertaining to refrigeration? What are the parameters required to be measured while estimating the chillers performance in KW/TR?	**10**
	b)	How do you calculate TR across the Air Handling Units (AHU)?	**10**
Q5)	**a)**	List any five energy efficiency measures in lighting system.	**10**
	b)	Discuss the following principles of energy auditing i)fuel and energy substitution ii) Optimizing the input energy requirements	**10**
Q6)	**a)**	Enlist five energy saving measures in a commercial building.	**05**
	b)	List general fuel economy measures in Boilers.	**05**
	c)	What are the energy conservation opportunities in water pumps?	**05**
	d)	Write the circumstances in which variable speed drives are recommended?	**05**