

COLLEGE OF ENGINEERING, PUNE-5
Third Year B.Tech
(MT-306) Energy Conservation and Environmental Safety
END SEM EXAM

Time: 3 Hours

Max. Marks: 60

Instructions to candidates:

- 1) All questions are **Compulsory**.
 - 2) **Neat Diagrams** must be drawn wherever necessary.
 - 3) Assume suitable data, if necessary.
 - 4) Numbers to the right indicate full marks.
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Q.1

- a) What are the different techniques for energy conservation through thermal efficiency and wastage control? Explain Life Cycle approach in detail? (5)
- b) Briefly explain the limitations in implementing the Energy Conservation measures in metallurgical industries. (5)

Q.2

- a) If you want to start an integrated steel plant in the city of Pune. What factors do you consider to decide the location of the plant? Draw a neat sketch of integrated steel plant layout. (5)
- b) What are the different organization evaluation standards under ISO 14000? What are the steps to be followed to get ISO 14000 certification? Compare ISO 14000 with EMAS. (5)

Q.3

- a) In a heat treatment furnace, the exhaust gases are leaving the furnace at 1200°C at the rate of $2200\text{ m}^3/\text{hr}$. If the final exhaust (i.e. at the base of the chimney) temperature is 160°C , find the recoverable heat in Kilowatts. The density of the exhaust gases is 1.19 Kg/m^3 and specific heat of gases at constant pressure is $1.008\text{ KJ/Kg}^{\circ}\text{C}$. (5)
- b) Name the devices to recover "waste heat" from gases. Explain the principle of any one device with neat sketch. (5)

Q.4

- a) What are the different sources of pollution in Copper industries? Explain their abatement ways. (5)
- b) Explain Bayer's process in detail with a neat diagram. What are the sources of pollution in Bayer's process and suggest their controlling measures. (5)

- Q.5
- a) What are the different sources of pollution in Foundry industry? List all the systems for collecting the dust from the cupola gas. (5)
 - b) Consider case study of Successful Chrome Deposit Corporation industry which has conducted Energy Audit Survey. Analyse and explain what are the different methods followed by that industry to increase efficiency and reduce energy consumption and environmental pollution. (5)
- Q.6 *Write short notes on the following.*
- a) Convective recuperator (2)
 - b) Oxidation pond (2)
 - c) BLEVE (1)
- Q.7 *Write short notes on the following*
- a) Carbon foot print (2)
 - b) Dog House (2)
 - c) Down time (1)

*** End of the Paper ****