

April 2025

Time - Three hours  
(Maximum Marks: 100)

- [N.B. 1. Answer all questions under Part-A. Each question carries 3 marks.  
2. Answer all the questions either (a) or (b) in Part-B. Each question carries 14 marks.]

PART - A

1. Define dryness fraction.
2. Write the expression for enthalpy of wet steam and super heated steam.
3. Name the impurities present in water.
4. What are the heat losses of a boiler?
5. Write the uses of electrostatic precipitator.
6. What are the methods of compounding?
7. Differentiate nuclear fission and nuclear fusion.
8. State the function of control rods in nuclear reactor.
9. List the uses of compressed air.
10. List the merits of turbojet engines.

[Turn over.....]

PART - B

11. (a) (i) Determine the external work of evaporation, enthalpy, internal energy and internal latent heat for 1kg of the dry saturated steam at a pressure of 10bar. (10)  
(ii) State the advantages of superheated steam. (4)  
(Or)  
(b) Explain the working of bucket calorimeter with neat sketch.
12. (a) Explain the working of BHEL high pressure boiler with line sketch.  
(Or)  
(b) A boiler is supplied with coal of calorific value 30,000 kJ/kg and produces 8 kg of steam per kg of coal burnt. The feed water heated by flue gases enters an economizer at 35°C and leaves at 110°C. The steam is generated at a pressure of 12bar with dryness fraction of 0.95. This steam enters the super heater and leaves at 200°C. Find the efficiency of the boiler and the proportion of heat given to steam in each section.
13. (a) Explain the following with the aid of line diagram: (i) fuel and ash circuit (ii) air and flue gas circuit (iii) cooling water circuit.  
(Or)  
(b) (i) What is the purpose of compounding in steam turbine? (4)  
(ii) Describe about the velocity compounding in steam turbine with neat sketch. (10)
14. (a) Explain the working of diesel power plant with layout diagram.  
(Or)  
(b) Describe the pressurized water reactor with neat sketch.
15. (a) Explain the working of centrifugal air compressor with neat sketch.  
(Or)  
(b) Explain the working of ramjet engine with neat sketch.

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