6448

BOARD DIPLOMA EXAMINATION
MARCH/APRIL - 2019
DIPLOMA IN MECHANICAL ENGINEERING
THERMAL ENGINEERING II
FOURTH SEMESTER EXAMINATION

Time: 3 Hours **Total Marks: 80**

PART - A (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Write expression for external work of evaporation for a. wet steam b. dry steam at a given pressure
2. State any three features of supercritical boilers
3. Show that the enthalpy drop is equal to the change of internal energy in hyperbolic process
4. Draw T-s and h-s diagrams for Throttling process
5. Define the term steam nozzle. List any two types of steam nozzles
6. Define compounding. Name any two types of compounding
7. Define a) bleeding of steam turbines b) reheating of steam turbine
8. Write the classification of gas turbines
9. State the principle of Ram effect
10. State the function of differential

PART - B (10m x 5 = 50m)

Note 1:Answer any five questions and each carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. a. Define critical point. What are the pressure and temperature of steam at critical point? (4 MARKS)

    b. Draw T-h diagram in respect of steam and show the salient points on it. (6 MARKS)

12. Explain the working of Lamont boiler with a neat sketch

13. Steam is throttled from a pressure of 11.5 bar to 1.4 bar. If the steam is dry saturated at the end of the expansion, Find
    a. Dryness fraction of steam at beginning
    b. Change in entropy

14. Dry saturated steam at a pressure of 15 bar expands isentropically in an nozzle and is discharged at a pressure of 1 bar. Find the dryness fraction of steam at the exit of nozzle and also find the final velocity of steam neglecting the initial velocity using steam tables.

15. The angles at inlet and discharge of the blading of a reaction turbine are 35^0 and 20^0 respectively at the mean blade ring diameter. The speed of rotation is 25 rev/s and at a particular moving ring the mean blade ring diameter is 0.6 m and the steam conditions 1.4 bar, 0.96 dry. Estimate
    a. The required height of the blade to pass 3.26 kg/s of steam
    b. Power developed by the ring

16. Draw Atkinson's cycle for constant volume gas turbines and explain the sequence of operations

17. Explain the working principle of rocket engine with a neat sketch

18. Draw the layout of an automobile transmission system and write the function of each component

- xxx -