C16–M–**403**

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BOARD DIPLOMA EXAMINATION, (C–16)
SEPTEMBER/OCTOBER - 2020
DME—FOURTH SEMESTER EXAMINATION

THERMAL ENGINEERING—II

Time : 3 hours]　　　　　　　　　　　　　　[*Total Marks* : 80

PART—A　　　　　　　　　3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Explain liquid vapour region on *T-s* chart.

2. Briefly explain water tube boiler.

3. Explain constant volume process on *P-V* and *T-s* charts.

4. Steam is at a pressure of 10 bar and enthalpy of 2650 kJ/kg. Find the quality of steam.

5. Briefly explain the types of nozzles.

6. Define bleeding in a steam turbine and its effect.

7. Define reheat factor.

8. Explain reheating in gas turbines and effects.

9. State properties of fuels used in jet propulsion.

10. State the function of a differential unit.

PART—B 10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Calculate the enthalpy and entropy of steam at 12 bar when it is, *(a)* saturated, *(b)* dry with 0·9, *(c)* superheated at 330 °C.

Take C_{ps} 2 09 kJ/kgK.

12. Explain with neat sketch the construction and working of Lamont boiler.

13. Steam initially at a pressure of 12 bar and 240 °C expands isentropically to 2 bar. Find *(a)* the final condition, *(b)* work transfer and *(c)* change in internal energy.

14. Dry saturated steam enters a steam nozzle of a pressure of 10 bar expands isentropically to 1 bar pressure. Determine *(a)* quality of steam at exit and *(b)* exit velocity. Assume the inlet velocity to nozzle is zero.

15. The absolute steam entry velocity of a single-stage impulse turbine is 600 m/s, nozzle angle is 20°, ratio of blade speed to whirl component of steam speed is 0·5, blade velocity coefficient is 0·85. Find *(a)* the blade angles at inlet and outlet if the steam enters without shock and leaves the blade in an axial direction, *(b)* power developed if the steam flow rate is 5 kg/sec, *(c)* blade or diagram efficiency and *(d)* axial thrust.

16. Explain in detail any two methods to improve thermal efficiency in gas turbines.

17. Explain the working of ram jet engine with a neat sketch.

18. Explain the construction and operation of a sliding mesh gearbox.

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