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C09–M–405

3505

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2015

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. Name various methods of lubrication used in IC engine.

2. Explain the term—specific fuel consumption. Mention its units.

3. Define volumetric efficiency of a compressor.

4. List out the applications of rockets.

5. List various resistances encountered by moving vehicle.

6. List two important accessories and their functions used in steam boilers.

7. Define the following terms :

(a) Boiler horse power

(b) Thermal efficiency of a boiler

8. The dry saturated steam at a pressure of 5 bar is expanded isentropically in a nozzle to a pressure of 0·2 bar. Find the velocity of steam leaving the nozzle.

9. Define the terms blade efficiency and nozzle efficiency in a steam turbine.

10. Differentiate the throttle governing with nozzle control governing used in steam turbine.

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. Discuss about the methods of governing IC engines.

12. *(a)* State the relative advantages and disadvantages of battery and magneto-ignition systems.

(b) Explain the pressure compounded impulse turbine showing pressure and velocity variation along the axis of the turbine.

13. An air compressor takes air at 1 bar 20 °C and compresses it according to law $PV^{1\,2}$ constant. It is then delivered to a receiver at a constant pressure of 10 bar. Take R 0 287 kJ/kg-K. Determine—

(a) temperature at the end of compression;

(b) work done and heat transferred during compression per kg of air.

14. *(a)* Explain the working difference between Ram-jet engine and Turbo-jet engine.

(b) Explain with neat sketch the working of a simple constant pressure open cycle gas turbine.

15. Describe the steering mechanism of an automobile vehicle.

16. Explain the working of a La-Mont boiler with a neat sketch.

17. Derive an expression for maximum discharge through convergent divergent nozzle for steam.

18. *(a)* Derive an expression for work done and power developed on blades of a steam turbine.

(b) Explain the Parson's reaction turbine with a sketch.

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