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C09–M–405

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BOARD DIPLOMA EXAMINATION, (C–09)

APRIL/MAY—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. Write the function of carburetor of an IC engine.

2. List the objectives of supercharging of an IC engine.

3. List out various types of rotary compressors used for compressing air.

4. Give the classification of the jet propulsion units.

5. Write the functions of propeller shaft.

6. What do you mean by mounting and accessory of steam boiler?

7. Write the advantages of artificial draught system over natural draught system.

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. What do you mean by blade speed ratio? Write its expression.

10. Write the working principle of a reaction turbine.

PART—B

10×5=50

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

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

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

11. The observations were made during a trail on 2-stroke engine for half an hour when it was running at 300 RPM, stroke=300 mm, bore=200 mm, indicated mean effective pressure=6 bar, dead load on brake drum and spring balance readings are 1400 N, 90 N respectively, mean circumference of brake drum=320 mm, fuel consumed=4·2 kg, calorific value of fuel=44000 kJ/kg. Determine—

(a) mechanical efficiency;

(b) indicated thermal efficiency;

(c) brake thermal efficiency.

12. Explain the working principle of single-stage single-acting reciprocating air compressor with a line diagram.

13. Explain the working principle of constant pressure gas turbine with help of a neat sketch.

14. Describe the working principle of friction clutch with the help of neat sketch.

15. Draw a neat sketch of Babcock and Wilcox boiler and explain its construction and working.

16. Determine the diameters of throat and exit for steam nozzle to convey 10 kg/min where the inlet conditions are 12 bar and 250 °C and the final pressure is 2 bar. Neglect initial velocity of steam and effect of friction.

17. Explain pressure-velocity compounding of steam turbine with a neat sketch.

18. *(a)* Write the classification of IC engines based on any five categories.

(b) Compare impulse turbine with reaction turbine.

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