3505

BOARD DIPLOMA EXAMINATION, (C–09)

OCT/NOV—2014

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. What is supercharging of an IC engine?

2. Differentiate coil-ignition system from magneto-ignition system.

3. Write any three differences between axial flow and radial flow compressors.

4. Give the classification of the jet propulsion units.

5. Write the functions of front axle of an automobile.

6. Explain the forced draught system in a steam boiler.

7. Write the function of safety valve in a steam boiler.

8. Draw *H-* diagram for frictional adiabatic flow of steam through a steam nozzle.

9. Differentiate the throttle governing from nozzle-control governing.

10. Write the factors on which the blade height of turbine depends.

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. A diesel engine has compression ratio of 14:1 and the fuel is cut off at 0·08 of the stroke. If the relative efficiency is 0·5, estimate the consumption of fuel in kg/kWh, when the calorific value of fuel is 44000 kJ/kg and for air is 1·4.

12. Determine the minimum work required to compress 1 kg of air from a 1 bar and 27 °C to 8 bar abs in two stages. The law of compression is $PV^{1\cdot4}$ const, and inter-cooling is complete. If the air was compressed in single stage between the same limits, what is the percentage saving in work by compressing it in its two stages? Take R 0 29 kJ/kg K.

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

14. Explain the construction and working of differential with a neat sketch.

15. Describe about Benson boiler with the help of a neat sketch.

16. A nozzle discharges 0·95 dry saturated steam at 10 bar pressure in to a tank where the pressure is 0·1 bar. The diameter of the nozzle at the throat is 10 mm. If the flow is frictionless adiabatic, what mass of steam will pass through the nozzle per minute? Also calculate the exit area of nozzle.

17. *(a)* Write the classification of steam turbines.

     (b) Describe the principle of operation of a reaction turbine.

18. *(a)* Draw the valve-timing diagram for a 4-stroke SI engine.

     (b) Derive an expression for work done and power developed by an impulse turbine.

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