3505

C09-M–405

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BOARD DIPLOMA EXAMINATION, (C-09)

MARCH/APRIL—2021

DME - FOURTH SEMESTER EXAMINATION

THERMAL ENGINEERING - II

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

PART—A 4×5=20

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

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

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

1. Name different ignition systems used in IC engines.

2. A single-cylinder 4-stroke petrol engine develops an indicated power of 30 kW and brake power of 26 kW. Find the mechanical efficiency.

3. List different types of air compressors.

4. How are gas turbines classified?

5. State the function of differential in an automobile.

6. List three important boiler accessories.

7. How do you classify draught?

8. Mention the assumptions made in analyzing the flow of steam through a nozzle.

9. Write any three advantages of steam turbine over steam engine.

10. What is meant by governing of steam turbine?

PART—B

15×4=60

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

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

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

11. Explain the working principle of two-stroke petrol engine with a neat sketch.

12. A two-stage compressor takes 3 m^3 of air per minute at a pressure of 1 bar. It delivers the air at 9 bar. The compression is carried out in each cylinder according to the law $pV^{1.2}$ = constant. The air is cooled to its initial temperature in an intercooler. Find the minimum power required to drive the compressor.

13. Describe the working of a closed-cycle gas turbine with a neat sketch.

14. Explain the working of 3-speed sliding-type gearbox with a neat sketch.

15. Explain the construction and working of Benson boiler with a neat sketch.

16. Wet steam at 10 bar and dryness fraction of 0·9 is discharged through a convergent-divergent nozzle to a back pressure of 0·1 bar. If the mass flow rate is 0·5 kg/s, determine the throat pressure and throat diameter using Mollier diagram.

17. Explain the working of Parson's reaction turbine with a neat sketch.

18. *(a)* Explain splash lubrication system with a neat sketch.

(b) Write the differences between impulse and reaction turbines.

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