



C14-M-404

**4480**

**BOARD DIPLOMA EXAMINATION, (C-14)  
MARCH/APRIL—2018  
DME—FOURTH SEMESTER EXAMINATION  
HEAT POWER ENGINEERING-I**

Time : 3 hours]

[ Total Marks : 80

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**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 meant by reversible cycle?
2. Why the actual engine does not work on Carnot cycle?
3. List out the advantages of IC engines over EC engines.
4. Draw the valve timing diagram for 4-stroke SI engine.
5. Write about the different fuel injection system used in CI engine.
6. Write the functions of carburetor in SI engine .
7. Write any six uses of compressed air.
8. Define volumetric efficiency of air compressor.
9. List out the fuels used in gas turbine.
10. List out any three advantages and disadvantages of jet propulsion engines.

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**PART—B**

10×5=50

- Instructions :** (1) Answer any *five* questions and each question carries ten marks.  
(2) Answer should be comprehensive and the criteria for valuation are the content but not the length of the answer.

- 11.** Derive an expression for efficiency of Otto cycle.
- 12.** (i) A diesel engine has a compression ratio of 14 and expansion ratio of 8. Find the air standard efficiency of the engine. Also calculate the network done if the heat supplied is 560 kJ. Take adiabatic index is 1.4.  
(ii) Write the difference between reciprocating air compressor with rotary air compressor.
- 13.** Explain with neat sketch the working of 4-stroke CI engine.
- 14.** Explain with neat sketch the construction and working of fuel injection pump.
- 15.** Explain the construction and working of zenith carburetor with neat sketch.
- 16.** In a trial on a single cylinder four-stroke cycle oil engine, 250mm bore and 450mm stroke. The following results were obtained:  
Duration of trial = 40min, Total revolution = 7000, Avg. dead load on brake = 900N, Avg. spring balance reading = 100N, Brake radius = 1m, Avg. imep = 560 kN/m<sup>2</sup>, Total fuel used = 3kg, Calorific Value = 45000kJ/kg
- Calculate (i) the indicated power, (ii) the brake power, (iii) the mechanical efficiency and (iv) the brake thermal efficiency

17. Derive an expression for work done required for multi-stage air compressor.
18. Explain the construction and working of constant pressure gas turbine with neat sketch.

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