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**BOARD DIPLOMA EXAMINATION, (C-14)
OCTOBER/NOVEMBER-2018
DME-FOURTH SEMESTER EXAMINATION**

HEAT POWER ENGINEERING-I

Time : 3 Hours]

[Total Marks: 80

PART-A

3X10=30

- Instructions :**
1. Answer **All** questions.
 2. Each question carries **THREE** marks
 3. Answer should be brief and straight to the point

1. Find the efficiency of an engine working on the Carnot cycle, heat is taken at 540°C and rejected at 45°C ?
2. Draw the line diagram for P-V and T-S for diesel cycle?
3. Define Top dead centre (TDC) and Bottom dead centre (BDC).
- * 4. Classify the I.C engines under various categories (any three).
5. Write the functions of Carburetor in I.C engines.
6. List out any three methods of Governing.
7. State any three applications of compressed air.
8. Classify different types of rotary compressor.
9. Classify the gas turbines.
10. State any two advantages and one limitations of Gas Turbines.

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Contd.,

PART-B

10X5=50

Instructions :

1. Answer any **five** questions. Each question carries **ten** marks.
2. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. In an ideal Otto Cycle the air at the beginning of Isentropic compression is 1 bar and 15⁰C. The ratio of compression is 8:1. The heat added is 1008 KJ/kg during constant volume process.

Take $\gamma=1.4$; $C_v = 0.714$ kJ/kg K

Determine (a) Maximum temperature in the Cycle

(b) The air standard efficiency

(c) The work done per kg of air

(d) The heat rejected per kg of air.

12. (a) An ideal diesel cycle has a compression ration 15:1 and the cut-off takes place at 1/5 of the stroke volume. Calculate the efficiency of the cycle. Take $\gamma=1.4$.

(b) Compare between reciprocating and rotary compressor?

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13. (a) Draw the legible sketch of I.C engine and name the various parts?

(b) Write short note on functions of following parts

(i) Cylinder head (ii) Piston rings (iii) Connecting rod

14. Explain the working principle of Magneto Ignition System with a legible sketch?

15. Explain the working principle of water cooling system with radiator & forces circulations with a neat sketch?

16. A four stroke Cycle CI engine has a bore of 100mm, stroke 150mm and runs at constant speed of 450 RPM. The following data refer to a test on the above engine.

Brake wheel diameter = 600mm

Band thickness = 5mm

Load on the brake = 210N

Spring balance reading = 30N

Area of indicator diagram = 415mm^2

Length of the indicator diagram = 62.5mm

Spring scale = 1.13 bar/mm

Brake specific fuel consumption = 0.3 kg/kWh

Calorific value of fuel = 42000 kJ/kg.

Calculate (a) BP and IP (b) Mechanical efficiency (c) Indicated thermal efficiency.

17. Estimate the minimum work required to compress 1kg of air from 1 bar 25°C to 16 bar in two stages with Law of Compression if $PV^{1.25}=\text{Constant}$ and the inter cooling is perfect Take $R=0.287\text{ kJ/kg K}$.

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18. Explain the working principle of Ramjet engine with a neat sketch.
