

Seat No. **OCT-NOV 2025 WINTER EXAMINATION****1154 B.Tech. CBCS****Sub. Name: Internal Combustion Engines****Sub. Code: 81527/81804****Day and Date: Wednesday, 17-12-2025****Total Marks: 70****Time: 10:30 AM To 01:00 PM**

- Instructions:**
1. All questions are compulsory
 2. Assume suitable data wherever necessary and mention it boldly
 3. Figures to the right indicate full marks

Q1) Solve any TWO [12]

- a. Define the following [6]
 - i) Swept Volume
 - ii) Compression Ratio
 - iii) Cubic Capacity
- b. Explain in detail the Valve timing diagram for 4-stroke Diesel Engine [6]
- c. A gas engine working on the otto cycle has a cylinder of diameter 200mm and stroke 250mm. The clearance volume is 1570cc. Find the air standard efficiency. Assume $C_p=1.004 \text{ KJ/Kg}^\circ\text{K}$ and $C_v=0.717 \text{ KJ/Kg}^\circ\text{K}$ for air [6]

Q2) Solve any TWO [12]

- a. Describe various types of fuel injection systems used for Diesel Engines [6]
- b. Explain with neat sketch Simple carburettor [6]
- c. Explain the solid injection system for CI Engines and its types [6]

Q3) Solve any TWO [12]

- a. Explain with neat sketch the different types of combustion chambers used in SI engines. [6]
- b. Explain the Factors influencing knocking in SI engine. [6]
- c. Describe the phenomenon of detonation and knocking in SI engine. On what factors does detonation depends? [6]

- Q4) Solve any TWO [12]**
- a. Explain the combustion stages in CI engines with the help of P-Q Curve [6]
 - b. Compare the abnormal combustion in SI and CI engine? [6]
 - c. Explain requirements of good combustion chambers for CI Engines [6]
- Q5) Solve any TWO [12]**
- a. Define the following i) Brake thermal efficiency ii) Mechanical efficiency iii) Volumetric efficiency [6]
 - b. What do you mean by heat balance sheet of IC engine? Explain how engine heat balance sheet is prepared. [6]
 - c. Following observations were made during a test on four cylinder four stroke engine, Engine speed - 3000 rpm. Net load on drum 160 N, Length of torque arm =400 mm, when cylinder no 1 to 4 were cut turn by turn in Morse test at 3000 rpm Net load on the brake dynamometer were respectively 116 N, 114 N, 112 N, 108 N. Take C.V. of fuel- 44000 kJ/kg and BSFC-0.316 kg/kWhr. Find out 1) B.P. 2) I.P. 3) Mechanical Efficiency. [6]
- Q6) Write a short note on any TWO [10]**
- a. S.I & C.I Emissions & control [5]
 - b. Catalytic converters [5]
 - c. Super-Charging in SI Engines [5]
 - d. Merits & Demerits of Supercharging of C.I engine [5]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (81804) Internal Combustion Engines Part 3 SEM 6

2] (1154) B.Tech. CBCS (81527) Internal Combustion Engines Part 3 SEM 6