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May 2025

B. Tech. (MECH) (Sixth Semester)

Internal Combustion Engine (PEC-ME-603-21)

Time : 3 Hours] [*Maximum Marks : 75*

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

Part A

1. (a) What are Internal Combustion Engines ? **1.5**

(b) What are the classifications of IC Engines ? **1.5**

(c) What is the function of Fuel Injection Pump system ? **1.5**

(d) What is the Ignition lag ? **1.5**

(e) What is Battery Ignition System ? **1.5**

(f) What is Brake Power ? **1.5**

(g) What is the need for Turbocharging system ? **1.5**

(h) What is Air Cooling system ? 1.5

(i) What is the composition in CNG ? 1.5

(j) When EURO standards started and where ? 1.5

Part B

2. (a) What are the differences Between 4-Stroke Petrol and Diesel Engine ? 10

(b) Draw and explain Valve Timing Diagram for 2-Stroke Petrol Engine. 5

3. (a) Discuss the Detonation and process of controlling it. 10

(b) What are different Effects of the Turbocharging ? 5

4. During the test (60 minutes) on a single-cylinder oil engine operating on a cylinder diameter 450 mm, stroke 450 mm and a four-stroke cycle, the following observations were made: total usage Fuel = 14 litres, Calorific value of fuel = 45000 kJ/kg, Total number of revolutions = 15000 Gross indicated mean effective pressure = 10.20 bar, pumping m.e.p. = 1.2 bar, Net load at brake = 3850N, diameter of brake wheel drum 3.5 m,

diameter of rope = 80 mm, cold water circulating = 560 litres, temperature rise of cooling water = 500*C, specific gravity of oil, Determine : 15

(i) Indicated power

(ii) Brake power

(iii) Mechanical Efficiency.

5. (a) What are the advantages of Lubrication system ? 5

(b) What are different types of Cooling system used in IC Engines ? 10

6. (a) What are the different Emissions produced in IC engines and techniques for controlling these ? 10

(b) Discuss PCV system in detail with suitable diagram. 5

7. What is the Multi-point Fuel Injection System, discuss in detail ? 15

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