

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code:2161902

Date:22-05-2025

Subject Name:Internal Combustion Engines

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) Explain valve timing diagram of four stroke petrol engine. **07**
(b) Give the name of Scavenging methods and explain any one. **07**
- Q.2** (a) Explain emission from CI engine. **07**
(b) Types of losses in actual fuel- air cycle and explain any two. **07**
- OR**
- (b) Describe the construction and explain the working of Junkers' gas calorimeter. **07**
- Q.3** (a) Explain (1) Willan's line method for engine testing. **07**
(2) Difference between Euro norms and Bharat stage norms.
(b) Explain characteristics of SI engine fuel **07**
- OR**
- Q.3** (a) Define Rich, Lean and Stoichiometric A: F mixture. **07**
(b) Explain solex carburetor with neat figure. **07**
- Q.4** (a) Define (1) Thermal efficiency (2) Indicated power (3) Mechanical efficiency (4) Brake power **07**
(b) Explain battery ignition system with neat sketch. **07**
- OR**
- Q.4** (a) Give the name of supercharging methods and explain any one. **07**
(b) Explain effect on engine variables on knock or detonation. **07**
- Q.5** (a) Types of lubrication system and explain splash lubrication system. **07**
(b) Explain indicated power by morse test. **07**
- OR**
- Q.5** (a) A 4-cylinder, 4-stroke petrol engine 6 cm bore and 9 cm stroke was tested at constant speed. The fuel supply was fixed to 0.13 kg/min and plugs of 4-cylinders were successively short-circuited without change of speed. The power measurements were as follows:
With all cylinder working=16.25 kw
With No.1st –cylinder cut-off =11.55 kw
With No.2nd –cylinder cut-off =11.65 kw (BP)
With No.3rd –cylinder cut-off =11.70 kw (BP)
With No.4th –cylinder cut-off =11.50 kw (BP)
Find (a) The IP of engine (b) Mechanical efficiency (c) Indicated thermal efficiency if CV of fuel used is 42000 kj/kg.
Assume clearance volume 60 cu.cm. **07**
(b) Explain different components used in MPFI engine. **07**
