

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 1 – EXAMINATION – SUMMER 2026

Subject Code: BE01000081 /BE01R00081

Date: 23/06/2026

Subject Name: Basic Mechanical Engineering

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 in brief concept of energy, work and power. **03**
(b) State and explain in brief First law of thermodynamics. **04**
(c) Write short note on environmental issues of Global warming and ozone depletion. **07**
- Q.2** (a) State and explain Charles's law. **03**
(b) Explain adiabatic process by stating examples. **04**
(c) With a neat sketch explain Throttling calorimeter. **07**
- OR**
- Q.2** (c) A steam power plant uses steam at boiler pressure of 150 bar and temperature of 550°C with reheat at 40 bar and 550 °C at condenser pressure of 0.1 bar. Find the quality of steam at turbine exhaust. **07**
- Q.3** (a) Explain in brief about the concept of heat engines. **03**
(b) Explain Rankine cycle with sketch. **04**
(c) Explain construction and working of Babcock and Wilcox boiler with neat sketch. **07**
- OR**
- Q.3** (a) Enlist classification of Internal combustion engines. **03**
(b) Differentiate the functions of boiler mountings and accessories. **04**
(c) Following observations were recorded during a test on a single cylinder 4- stroke oil engine: Bore =300 mm; Stroke = 450 mm; Speed =300 rpm; imep = 6 bar; Net brake load = 1.5 kN; Brake drum diameter = 1.8 m; Brake rope diameter = 2 cm. Calculate: (i) Indicated Power (ii) Brake Power (iii) Mechanical Efficiency. **07**
- Q.4** (a) Explain in brief about function of an air compressor. **03**
(b) Write short note on Priming. **04**
(c) Explain construction and working of reciprocating pump with neat sketch. **07**
- OR**
- Q.4** (a) State function of refrigerant in vapor compression refrigeration system. **03**
(b) Write short note on vapor absorption refrigeration system. **04**
(c) Explain construction and working of window conditioner with neat sketch. **07**
- Q.5** (a) Explain Oldham coupling with neat sketch. **03**
(b) Describe centrifugal clutch with neat sketch. **04**
(c) Explain construction and working of shoe brake with neat sketch. **07**

OR

Q.5	(a) Explain different arrangement and application of belt drive.	03
	(b) Differentiate ferrous and nonferrous metals	04
	(c) Write short note on plastic and polymers materials.	07
