

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER 1&2 EXAMINATION – SUMMER 2020****Subject Code: 3110006****Date:06/11/2020****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.

		MARKS
Q.1	(a) Discuss Closed, Open and Isolated Thermodynamic system with neat sketch.	03
	(b) Define the terms: Hardness, Toughness, Ductility, Elasticity	04
	(c) Derive an expression for internal energy for a closed system	07
Q.2	(a) Distinguish between coupling and clutch.	03
	(b) Explain Equivalent evaporation and factor of evaporation	04
	(c) The heat transfer from a heat reservoir is proportional to its temperature: Justify by deriving equation.	07
	OR	
	(c) Explain construction and working of centrifugal pump with a neat sketch	07
Q.3	(a) Explain the construction and function of Steam Trap with neat sketch	03
	(b) Write the uses of “Steam Tables”	04
	(c) 1.5kg of steam at a pressure of 10bar and temperature of 250°C is expanded until the pressure becomes 2.8 bars. The dryness fraction of steam is then 0.9. Calculate change in Internal Energy	07
	OR	
Q.3	(a) List different mountings of boiler and explain any one in brief.	03
	(b) Derive the equation for air standard efficiency of Otto cycle.	04
	(c) A petrol engine with a stroke length of 200 mm and diameter of 150 mm has a clearance volume of $7 \times 10^5 \text{ mm}^3$. If the indicated thermal efficiency is 0.30, find the relation efficiency. If the effective pressure is 5 bar and engine runs at 1000 rpm. Find the IP of the engine. take $\gamma=1.4$	07
Q.4	(a) Discuss with neat sketch Diaphragm pump.	03
	(b) Distinguish between Reciprocating and Rotary Compressor.	04
	(c) Discuss the construction and working of four stroke Petrol engine.	07
	OR	
Q.4	(a) Draw a neat sketch of p-v diagram showing Free Air Delivery for air compressor.	03
	(b) Define the terms ‘Refrigeration’, “Ton of Refrigeration” and “Coefficient of Performance”	04

- (c) Calculate the energy consumed in one month for following conditions: COP of air-conditioning unit : 5
Capacity of air conditioner :
2 TR No of air conditioners
: 8
All air conditioners run for 4 hours/day. **07**
- Q.5** (a) What is throttling calorimeter? Explain its limitation **03**
(b) Discuss with neat sketch any two boiler accessories. **04**
(c) Give comparison between Belt, Chain and Gear drive. **07**
- OR**
- Q.5** (a) How metals are classified? Show with block diagram **03**
(b) Define velocity ratio of pulleys and discuss effect of slip and creep on motion transmission **04**
(c) Discuss the following with application and Properties: **07**
(i) Glass
(ii) Ceramic
(iii) Plastics
