

**GUJARAT TECHNOLOGICAL UNIVERSITY****B.VOC- SEMESTER– I EXAMINATION – WINTER 2023****Subject Code:21110302****Date:28-12-2023****Subject Name:General Mechanical Engineering****Time:10:30 AM TO 12:30 PM****Total Marks:50****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.

	<b>Marks</b>
<b>Q.1 (a)</b> What is thermodynamic process? Explain any two thermodynamic processes with suitable example.	<b>05</b>
<b>(b)</b> What is moment and couple? Differentiate it with suitable example.	<b>05</b>
<b>Q.2 (a)</b> Explain carnot cycle with schematic diagram.	<b>05</b>
<b>(b)</b> State second law of thermodynamics. Explain application of second law of thermodynamics.	<b>05</b>
<b>OR</b>	
<b>(b)</b> Explain adiabatic process. Write assumptions of adiabatic process.	<b>05</b>
<b>Q.3 (a)</b> Explain parallelogram method and derive equation of resultant.	<b>05</b>
<b>(b)</b> What is free body diagram? Take suitable example and draw free body diagram of forces.	<b>05</b>
<b>OR</b>	
<b>Q.3 (a)</b> Explain law of triangle of forces to derive resultant force.	<b>05</b>
<b>(b)</b> Explain Lami's theorem of forces.	<b>05</b>
<b>Q.4 (a)</b> Define stress. Explain tensile, compressive and shear stress with stress distribution diagram.	<b>05</b>
<b>(b)</b> Draw and explain stress – strain diagram of brittle material.	<b>05</b>
<b>OR</b>	
<b>Q.4 (a)</b> What is bulk modulus and modulus of rigidity? Derive relation between them.	<b>05</b>
<b>(b)</b> State and explain Hooke's law.	<b>05</b>
<b>Q.5 (a)</b> Difference between Ferrous and Nonferrous materials.	<b>05</b>
<b>(b)</b> Write applications of silica material.	<b>05</b>
<b>OR</b>	
<b>Q.5 (a)</b> Enlist properties of abrasive material.	<b>05</b>
<b>(b)</b> Differentiate between thermo-plastic and thermo-setting material.	<b>05</b>

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