R. N. G. PATEL INSTITUTE OF TECHNOLOGY-RNGPIT
(An Autonomous Institute U/s UGC Act 1956)

B.Voc. SEMESTER-I, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1PT102   **DATE: 17-12-2025**

SUBJECT NAME: GENERAL MECHANICAL ENGINEERING

TIME: 11:00 AM to 01:00 PM   **TOTAL MARKS: 50**

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

			Marks	BL	CO
Q.1	(a)	Explain any five types of force systems with neat sketch.	05	R	4
	(b)	Define force and explain its characteristics in brief.	05	R	4
Q.2	(a)	Explain parallelogram method and derive the equation of resultant force.	05	A	4
	(b)	Calculate the resultant of the force system as shown in figure-1.	05	A	4

OR

			Marks	BL	CO
Q.2	(a)	Using analytical method, find the resultant of two forces 30 N and 40 N acting at a point. The forces are acting away from the point and make an angle of 60° with one another.	05	A	4
	(b)	Using graphical method, find magnitude and direction of the resultant for the system shown in figure-2.	05	A	4
Q.3	(a)	Define: tensile stress, shear stress, lateral strain, volumetric strain, Poisson's ratio	05	R	5
	(b)	Define Stress and explain different types of stress in detail.	05	U	5

OR

			Marks	BL	CO
Q.3	(a)	Explain Hook's law with neat sketch.	05	U	5
	(b)	What do you mean by strain? Explain various types of strains.	05	U	5
Q.4	(a)	Classify the engineering materials in detail.	05	U	3

	(b)	Draw following process on p-v diagram (i) constant pressure cycle (ii) constant volume cycle (iii) isothermal process (iv) adiabatic process (v) polytrophic process	05	U	2

OR

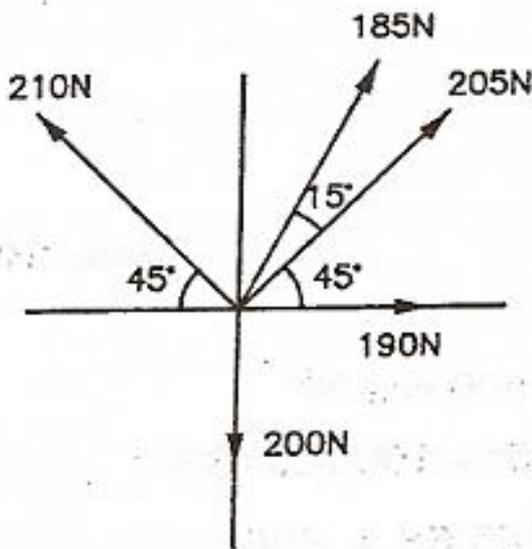|					
Q.4	(a)	Define: 1.Strength 2.Elasticity 3.Malleability 4.Ductility 5.Hardness	05	R	3
	(b)	Explain 1ˢᵗ law of thermodynamics.	05	U	2

Q.5	(a)	Explain different types of thermodynamic system with example.	05	U	1
	(b)	Explain Boyle's and Charles law with diagram.	05	U	1

OR

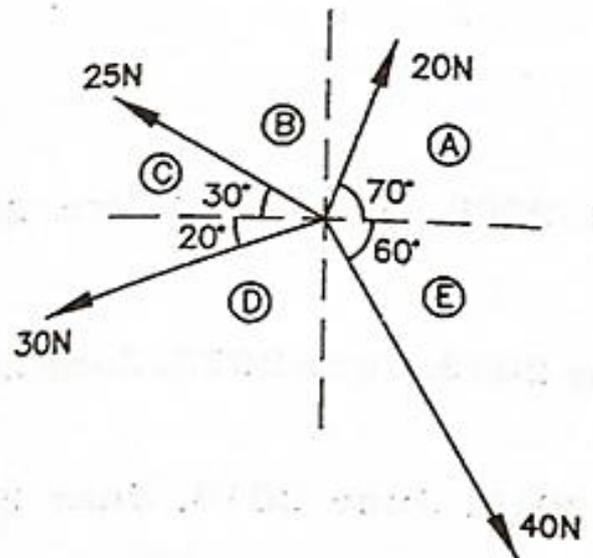|					
Q.5	(a)	Define Thermodynamics and enlist areas of application for it.	05	R	1
	(b)	Explain Zeroth law of thermodynamics with neat sketch.	05	U	1

Figure-1   **Figure-2**

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