

**First Year Bachelor of Prosthetics and Orthotics Degree Regular  
Examinations November 2025**

**Applied mechanics and Strength of materials  
(2024 Scheme)**

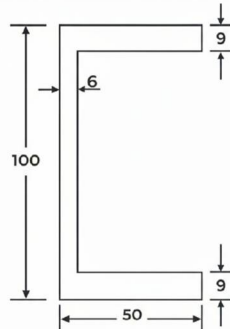
Time: 3 Hours

Total Marks: 80

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers • Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary
- Simple calculator shall only be permitted

**Essays****(2x15=30)**

1. Determine the Moment of Inertia of channel as shown in figure about its centroidal axes. The dimensions are in mm.



2. Explain various theories of failure in detail.

**Short Essays****(7x5=35)**

3. Explain scalar and vector quantities with examples.
4. Define the terms stress, strain and modulus of elasticity.
5. Explain stress concentration and its effect on fatigue.
6. Explain friction and co-efficient of friction.
7. Explain the significance of ergonomics integrated with applied mechanics in the design of Prosthetics, Orthotics and Industrial systems.
8. What are the main components of a control system.
9. Describe the role of display and control devices in man-machine communication.

**Answer briefly****(5x3=15)**

10. Define torque and mention its unit.
11. What is elastic limit.
12. Define Newton's law of motion.
13. Define longitudinal and lateral strain.
14. Define buckling and critical load.

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