

BACHELOR OF PHYSIOTHERAPY (BPT)
SEMESTER -II EXAMINATION, JUNE-2026

(BPT203) BASIC PRINCIPLES OF BIOMECHANICS

[Time allotted: Three Hours]

[Max Marks: 100]

Note: Read all the instructions carefully

Answer all questions in serial order, Draw suitable diagrams wherever necessary

Q. 1. Objective type questions: (Attempt All)

(10 x 02 = 20)

(Very short/ Short answer/ MCQ/ One liners/ Fill in the blanks/ True/False)

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| <p>a. Fibers of smooth muscle tissue are:</p> <ol style="list-style-type: none"> i. Thin and spindle shaped ii. Long, striated iii. Thick and spindle shaped iv. Short, straited <p>b. Smooth muscles are found in:</p> <ol style="list-style-type: none"> i. Heart ii. Skeletal muscle iii. Intestine iv. Brain <p>c. Arthrokinematics of TM joint includes ____.</p> <ol style="list-style-type: none"> i. Elevation ii. Depression iii. Retrusion iv. Distraction <p>d. ____ occurs in upper TM joint.</p> <ol style="list-style-type: none"> i. Mandibular protrusion ii. Lateral excursion iii. Elevation iv. Depression <p>e. Which of the following muscles is not involved in the elevation of the ribcage during inspiration:</p> <ol style="list-style-type: none"> i. External intercostal ii. Internal intercostal iii. Diaphragm iv. Sternocleidomastoid | <p>f. Which of the following structure separates the thoracic cavity from the abdominal cavity:</p> <ol style="list-style-type: none"> i. Costal cartilages ii. Diaphragm iii. Sternum iv. Intercostal muscles <p>g. Buoyancy is principal of:</p> <ol style="list-style-type: none"> i. Kinetics ii. Kinematics iii. Fluid mechanics iv. Gravity <p>h. Body at rest or in uniform motion tends to remain at rest or motion unless exerted by external force:</p> <ol style="list-style-type: none"> i. 1st law of motion ii. 2nd law of motion iii. 3rd law of motion iv. 4rth law of motion <p>i. Rolling ball is in:</p> <ol style="list-style-type: none"> i. Neutral equilibrium. ii. Dynamic equilibrium. iii. Unstable equilibrium. iv. Static equilibrium. <p>j. Arm abduction by deltoid is:</p> <ol style="list-style-type: none"> i. Concurrent force system example. ii. Linear force system example. iii. Parallel force system example. iv. Moment of force example |
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Q. 2. Short notes/ Short answer type questions (Attempt any Five)

(05 x 04 = 20)

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| <p>a. What is equilibrium, Mention States of equilibrium?</p> <p>b. Pathological conditions of gait along with their features</p> <p>c. Name force and injury Factors. Also explain force system</p> <p>d. Articular structures of TM joint</p> <p>e. Explain the effect of aging on muscle</p> <p>f. Name and explain force and injury factors</p> <p>g. Explain concept of bucket handle and pump handle movement</p> | <p align="right">PO1 CO1</p> <p align="right">PO8 CO3</p> <p align="right">PO1 CO1</p> <p align="right">PO5 CO2</p> <p align="right">PO5 CO4</p> <p align="right">PO1 CO1</p> <p align="right">PO5 CO2</p> |
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P.T.O.....

Q. 3. Structured questions (Attempt any Three)

(03 x 10 = 30)

- a. Explain the following: PO5 CO4
 - i. Effect of aging on muscle
 - ii. Effect of immobilization on muscle
 - iii. Explain the effect of injury on muscle
- b. Explain the following: PO1 CO1
 - i. What is mass
 - ii. Centre of mass
 - iii. Factor affecting center of mass
- c. Discuss biomechanics of: PO5 CO4
 - i. Rib Deformities
 - ii. Surgical intervention used to correct ribcage deformity
 - iii. Surgical intervention while maintaining optimal thoracic wall function
- d. Explain: PO5 CO2
 - i. Mechanical energy
 - ii. Kinetic Energy
 - iii. Potential Energy

Q. 4. Long Answer/ Essay type questions (Attempt any Two)

(02 x 15 = 30)

- a. Explain in detail biomechanics of ventilatory motions its coordination and integration. PO1 CO1
- b. Draw a diagram of structure of skeletal muscle. Also write the difference between red and white muscle. PO1 CO4
- c. Explain about joint structure and effect of disease, injury and immobilization on joint structure. PO2 CO5