

**B.Sc. PROSTHETICS AND ORTHOTICS  
SECOND YEAR  
PAPER V – BIO-MECHANICS - II**

*Q.P. Code: 802415*

**Time: Three Hours**

**Maximum : 100 Marks**

**Answer All questions**

**I. Elaborate on:**

**(3 x 10 = 30)**

1. Write in details about Kinematics of anatomical knee joint.
2. Explain the biomechanics of polycentric prosthetic knee joint.
3. Explain Circumduction, Vaulting and Foot slap.

**II. Write notes on:**

**(8 x 5 = 40)**

1. Explain the biomechanical principle of Quadrilateral socket design.
2. Explain Terminal impact, Abducted gait and Lateral trunk bending.
3. Outline the Biomechanical concepts of KAFO.
4. Explain in brief open and closed kinematic chain with their examples.
5. Describe the biomechanics of Transfemoral Residual Limb of short length.
6. Differentiate Pronated foot with supinated foot and their biomechanical effects.
7. What do you understand by whip and its causative factors?
8. Discuss the biomechanical effects of Knee Cuff.

**III. Short answers on:**

**(10 x 3 = 30)**

1. Explain Tripod crutch gait and its types.
2. A person walking with a constant speed of 5640 steps in one hour calculate his cadence.
3. What are the biomechanical reasons of SACH foot breakage?
4. Explain stride and step duration.
5. Write the biomechanical advantages of patella.
6. Explain Swing to and swing through crutch gait.
7. How Transfemoral prosthesis with quadrilateral socket can be aligned for voluntary knee control?
8. How enhanced stability is achieved prosthesis with in a polycentric knee?
9. Explain Windlass mechanism.
10. What are the Advantages of Titanium for KAFO system?

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