Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD (now MoE)
Re-accredited with 'A++' Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Bachelor's Degree Examination – May 2025
IV Semester

Class : II UG **Time: 3 Hours**
Major : Physiotherapy **Max. Marks: 100**

22BPTC18 Biomechanics - II

Course Outcomes:
On the successful completion of the course, students will be able to

CO1: Knowledge about the structure and functions of cervical, thoracic, lumbar and sacral vertebra.
CO2: Understands general and specific features of the hip, knee, and ankle complex.
CO3: Evaluate the pathological basis of injury and aging of the hip, knee and ankle complex
C04: Learn the different postural malalignment like scoliosis, kyphosis, lordosis and fixedflexion deformity
CO5: Knows about the variation between different pathological gait patterns

Part A **10 x 1 = 10**
Choose the Correct Answer

1. The primary function of the intervertebral discs is to CO1 K2
   a. Provide structural support b. Absorb shock and allow movement
   c. Protect the spinal cord d. Connect ribs to the spine

2. The distinguishing feature of lumbar vertebrae CO1 K2
   a. Presence of costal facets b. Bifid spinous process
   c. Large, kidney-shaped body d. Transverse foramina

3. The hip joint is stabilized primarily by which structure CO2 K1
   a. Rotator cuff muscles b. Cruciate ligaments
   c. Labrum and surrounding ligaments d. Annular ligament

4. The main blood supply to the head of the femur comes from which artery CO2 K3
   a. Obturator artery b. Femoral artery
   c. Medial and lateral circumflex femoral arteries d. Popliteal artery

5. The primary function of the anterior cruciate ligament (ACL) is to CO3 K2
   a. Prevent hyperextension of the knee b. Prevent posterior displacement of the tibia
   c. Prevent anterior displacement of the tibia d. Restrict valgus movement

6. The patella primarily functions to CO3 K4
   a. Increase the mechanical advantage of the quadriceps b. Protect the tibia
   c. Act as a shock absorber d. Limit knee flexion

7. The talus articulates with which bone to form the ankle joint CO4 K4
   a. Tibia b. Fibula c. Calcaneus d. Both a and b

8. Number of Bones make up the human foot CO4 K3
   a. 20 b. 26 c. 30 d. 33

9. During normal walking, what is the main function of the stance phase CO5 K5
   a. Generate forward propulsion b. Maintain balance and support body weight
   c. Lift the foot off the ground d. Increase walking speed

10. Muscle group that is primarily responsible for dorsiflexion during the swing phase CO5 K2
   a. Quadriceps b. Hamstrings c. Tibialis anterior d. Gastrocnemius

Part B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Explain IVDP.	CO1 K2
(or)	
11.b. Describe Primary and secondarycurves.	CO1 K1
12.a. Explain coxavara, coxavalga.	CO2 K3
(or)	
12.b. Explain angulation of hip complex.	CO2 K4
13.a. Define chondromalacia patella.	CO3 K1
(or)	
13.b. Describe Screw home mechanism.	CO3 K4
14.a. Define Hammertoe, clawtoe and Halluxvalgus.	CO4 K2
(or)	
14.b. Anatomy of Talocal caneonavicular joint.	CO4 K1
15.a. Explain fixed flexion deformity.	CO5 K3
(or)	
15.b. Describe the Gait determinants.	CO5 K2

Part C **5 x 12 = 60**

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Explain in detail about Spondylolisthesis.	CO1 K2
(or)	
16.b. Describe biomechanics of lumbar vertebra.	CO1 K1
17.a. List the types of dislocation of hip joint and its management.	CO2 K2
(or)	
17.b. Describe the femoral motions of the hip complex.	CO2 K4
18.a. Explain the function of the Tibio femoral joint and its mechanics.	CO3 K1
(or)	
18.b. Describe the Function of Menisci and its injury.	CO3 K1
19.a. Discuss the foot complex its structure and its mechanics.	CO4 K4
(or)	
19.b. Describe the weightdistributionintheanklejointduringunilateral&bilateralstance.	CO4 K4
20.a. Describe the Postural malalignments scoliosis, kyphosis Lordosis.	CO5 K3
(or)	
20.b. Explain in detail about any two Pathological gait.	CO5 K2

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