April-2001

[KD 915] **Sub. Code : 5148**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(Modified/Revised Regulations)

(Common to BPT and BOT Examinations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE of the following : (20)

(a) Describe the structure of the tibiofemoral articulation and explain the events occurring during a complete extension from a complete flexion.

Or

(b) Explain the features of lumbar vertebra with diagram and explain the movements of lumber spine.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Screwhome movement

(b) Isokinetic exercises

(c) Intervertebral disc

(d) Levers

(e) Angle of muscle pull

(f) Joint reaction forces

(g) Active insufficiency

(h) Lumbar pelvic rhythm.

3. Write an essay on any ONE of the following : (20)

(a) Explain the mechanics of the following :

(i) Pain reduction in hip joints with the help of a stick.

(ii) More degeneration between C_5–C_6 vertebral joints in degenerative arthritis.

(iii) Development of Tennis Elbow.

(iv) Instability of Knee diagnosed in an athelete.

(b) Explain about normal posture and explain about the impact of flexor contracture of knee, on function of an individual.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Scouosis.

(b) Reciprocal click of temporo mandibular joint.

(c) Cubitus valgas.

(d) Q angle and the importance.

(e) Supination pronation of foot.

(f) The extensor mechanism in hand.

(g) Collapse of the arches of foot.

(h) Functional position of wrist and hand.

[KD 927] **Sub. Code : 5317**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE of the following : (20)

(a) Describe structure of the glenohumeral joint and explain about dynamic stability.

(b) Describe in detail about prehension.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Passive insufficiency.

(b) Genuvarum.

(c) Chondromalasia patella.

(d) Relaxed position of knee joint.

(e) Tennis elbow.

(f) Mechanical events when a traction force applied to a joint.

(g) Arthrokine matics of wrist.

(h) Mechanics behind the total claw hand.

3. Write an essay on any ONE of the following : (20)

(a) Classify the muscles and explain the various factors affecting the efficient muscle tension.

(b) Describe various phases, determinants of normal gait cycle.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Analyse the posture of a young lady wearing high heels, foot wear.

(b) Anatomy and functions of iliotibial band.

(c) Importance of patella in knee.

(d) Differentiate arthrokinematics and osteokinematics.

(e) Gravity.

(f) Annular pulley in hand and its function.

(g) Cruciate ligaments of knee.

(h) Effect of equinus deformity of foot, over the knee.

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November-2001

[KE 915] **Sub. Code : 5148**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(Modified/Revised Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE : (1 × 20 = 20)

(a) Explain about the muscle activity at the lower limb during gait cycle.

Or

(b) Explain about the structure of WRIST complex and prehensile activities of hand.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Shunt and Spurt muscle

(b) Deltoid ligament of ankle

(c) Newton's law of reaction and reaction forces

(d) Quadricep's lag and effects

(e) Two joint muscles

(f) Equinus Gait

(g) Normal Curvature of SPINE.

3. Write an essay on any ONE : (1 × 20 = 20)

(a) Explain about the stability of shoulder joint and how the force is acting during shoulder abduction.

Or

(b) Explain about the centre and line of gravity in Rest and activities of body.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Active and Passive INSUFFICIENCY

(b) Equilibrium

(c) Lumbo pelvic Rhythm

(d) Bursae around the knee

(e) Distribution of weight in the foot

(f) Parameters of gait

(g) Effects of muscle in LORDOTIC POSTURE

(h) Carrying Angle in normal and abnormal.

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KE 927] **Sub. Code : 5317**

BACHELOR OF PHYSIOTHERAPY
DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE of the following : (20)

(a) Describe the muscles and the major ligaments of the lumbar vertebral column and explain clearly the role of the intervertebral disc in stability and mobility.

Or

(b) Describe the structure and function of the superior and inferior radio–ulnar joints. Explain the movements possible along with its axes and planes.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Classification of joints

(b) Scapulo—humeral rhythm

(c) Carrying angle

(d) Bursae surrounding the knee

(e) Phases in gait

(f) Lumbar–pelvic rhythm

(g) Muscle contractions

(h) Isokinetic exercises.

3. Write an essay on any ONE of the following : (20)

(a) Describe the structure and function of the Tibio–femoral joint and the effects of injury and disease on this joint. Explain the mechanism of screw–home movements.

Or

(b) Describe in detail the structure, ligaments and functions of the ankle joint and explain clearly the distribution of weight within the foot.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Intrinsic foot muscles

(b) Centre of gravity and stability

(c) Types of motion

(d) Arches of foot

(e) Pelvic tilt

(f) Parallel force systems

(g) Annular ligament

(h) Equilibrium and Law of Equilibrium.

[KG 915] Sub. Code : 5148

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(Modified/Revised Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write any ONE of the following : (1 × 20 = 20)

(a) Explain Planes and Axis and describe the above in pelvic tilts, pelvic rotation and hip movements.

(b) What do you mean by Parallel Force System and explain it with muscle actions.

2. Write any SIX of the following : (6 × 5 = 30)

(a) Joint compression forces

(b) Tendo achilles tendon

(c) Inguinal ligament

(d) Motor unit

(e) Isometric exercise

(f) Scoliosis

(g) Sterno clavicular joint

(h) Arches of foot.

3. Answer any ONE of the following : (1 × 20 = 20)

(a) Explain the factors governing Posture.

(b) Explain about the structure and stability of Knee joint.

4. Answer any SIX of the following : (6 × 5 = 30)

(a) Force and its components

(b) 'Q' angle

(c) Pes planus

(d) Iliotibial band

(e) Parameters of gait

(f) Biceps and importance

(g) Interossei

(h) Closed and open kinematics.

[KH 915] **Sub. Code : 5148**

BACHELOR OF PHYSIOTHERAPY
DEGREE EXAMINATION.

Fourth Semester

(Modified/Revised Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE of the following : (20)

(a) Describe in detail about the Arthrokinematics and Osteokinematics.

(b) Describe the dynamic stability of the gleno humeral joint utilising the Biomechanics principles.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Discuss curvatures of the vertebral column and add a note on scoliosis.

(b) Acute and passive insufficiency.

(c) Hip hicking.

(d) Extensor expansion.

(e) Describe the determinants of gait cycle.

(f) Carrying angle and its significance.

(g) Newton's Second Law.

(h) Screw home movement.

3. Write an essay on any ONE of the following : (20)

(a) Explain the force of gravity and how it encountered by the human body.

(b) Write in detail about the parallel force system.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Lumbo–Pelvic rhythm

(b) Law of equilibrium

(c) Bursae around the knee joint

(d) Kinematic chain

(e) Plantar arches structure and function

(f) Describe reaction force

(g) Articular structure of wrist joint

(h) Synovial fluid.

September-2002

[KH 927] Sub. Code : 5317

BACHELOR OF PHYSIOTHERAPY
DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE : (1 × 20 = 20)

(a) Describe Axes and Planes of a joint. Identify and explain the axes and planes of hip joint and atlanto-axial joint.

Or

(b) Discuss mechanical advantages of 3 orders of Levers with examples.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) Properties of connective tissue.

(b) Explain closed kinematic chain with examples.

(c) Describe Mobility and Stability, functions of muscle.

(d) Differentiate Active and Passive Insufficiency.

(e) Describe structural components of Typical and Atypical vertebra.

(f) Concentric and Eccentric contraction.

(g) Describe structural components of shoulder complex.

3. Write an essay on any ONE : (1 × 20 = 20)

(a) Describe the structure, support and arthrokinematics of Wrist joint.

Or

(b) Identify and discuss the static and dynamic stability of the Vertebral Column.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) What is Newton's Law of Reaction?

(b) Describe Prehension.

(c) Explain kinematics of gait.

(d) Describe the postural mechanism.

(e) Various Pinches and Grasps.

(f) Describe the functions of Tibio–femoral joint.

(g) Compare coxa vara with coxa valga in hip stability.

[KI 915] Sub. Code : 5148

BACHELOR OF PHYSIOTHERAPY
DEGREE EXAMINATION.

Fourth Semester

(Modified/Revised Regulations)

Paper III — BIOMECHANICS

me : Three hours Maximum : 100 marks

Write an essay on any ONE : (1 × 20 = 20)

(a) Describe centre of Gravity, line of gravity and e of support. Relate these terms from biomechanical nt of view.

Or

(b) What is elasticity? What is the significance of k's Law? Discuss its application in physiotherapy.

Write short notes on any SIX : (6 × 5 = 30)

(a) Anatomic pulley and its function

(b) Active and passive insufficiency

(c) Describe lumbar pelvic rhythm

(d) Accessory joint structure and its function

(e) Describe motions of vertebral column

(f) Describe the function of superior and inferior radio–ulnar joint

(g) Multifidus muscle

(h) Role of thoraco – lumbar fascia in lifting.

3. Write an essay on any ONE : (1 × 20 = 20)

(a) Describe Scapulo–Humeral rhythm. Explain kinematics of SHOULDER JOINT.

Or

(b) Explain the kinematic and kinetic analysis of GAIT.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) What is second order of Levers? Explain with examples.

(b) Explain active and inactive posture.

(c) Advantages and disadvantages of vector forces

(d) Describe mobility and stability of elbow complex

(e) Describe the hand complex

(f) Compare coxa vara with coxa valga in hip stability

(g) Explain time and distance parameters of gait

(h) Static and Dynamic posture.

April-2003

[KI 927] **Sub. Code : 5317**

BACHELOR OF PHYSIOTHERAPY
DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

1. Write an essay on any ONE of the following : (20)

(a) Discuss the intervertebral disc under following headings :

(i) Structure

(ii) Composition

(iii) Innervation and nutrition

(iv) Functions.

Or

(b) Describe the structural components of wrist complex? Discuss the movements taking place at radio–carpal and mid carpal joints. Explain about muscle actions acting at these joints.

2. Write short notes on any SIX : (6 × 5 = 30)

(a) What factor causes torque to change?

(b) What kind of force system does muscles form?

(c) Explain in brief the typical gait of a child just learning to walk.

(d) Visco–elastic properties of soft tissues.

(e) Hyaline cartilage.

(f) Golgi–Tendon organs.

(g) Multifidus muscle.

(h) Role of thoraco–lumbar fascia in lifting.

3. Write an essay on any ONE of the following : (20)

(a) What is Tarso–Metatarsal rays? Describe the axis of each ray and the movements that occur around each axis?

Or

(b) Explain the normal alignment of body segments in the sagittal plane under following headings:

(i) Joints

(ii) Line of gravity

(iii) Gravitational moment

(iv) Opposing ofrces.

4. Write short notes on any SIX : (6 × 5 = 30)

(a) Static and dynamic posture

(b) Functions of dorsi flexors during normal walking

(c) Quadratus plantae

(d) Closed – packed position of subtalar joint

(e) Genu recurvatum

(f) Patella Plica and its role in knee joi dysfunction

(g) How does the position of the knee affe muscle action at the hip joint?

(h) Trabecular system of bones of Hip Joint.

[KJ 915] **Sub. Code : 5148**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(Revised/Modified Regulations)

Paper III — BIO-MECHANICS

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

M.C.Q. must be answered **SEPARATELY** on the answer sheet provided as per the instructions on the first page of M.C.Q. Booklet.

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay Questions : (2 × 15 = 30)

1. Write an essay on the intervertebral disc and its biomechanics.

2. Biomechanics of hip joint and its role in gait.

II. Short notes : (10 × 5 = 50)

(a) Shunt muscles

(b) Length dependent muscle contractions

(c) Scapulo humeral rhythm

(d) Active and passive insufficiency

(e) Dynamic and static stabilizers of knee

(f) Normal posture

(g) Pretension

(h) Kinematic chains

(i) Joint reaction force

(j) Patho-mechanical causes of Osteo Arthritis of knee.

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[KJ 927] **Sub. Code : 5317**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

Theory : Two hours and Forty minutes — Theory : 80 marks

M.C.Q. : Twenty minutes — M.C.Q. : 20 marks

M.C.Q. must be answered **SEPARATELY** on the answer sheet provided as per the instructions on the first page of M.C.Q. booklet.

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay Questions : (2 × 15 = 30)

1. Write an essay on "Human Gait".

2. Biomechanics of the shoulder joint.

II. Short notes : (10 × 5 = 50)

(a) Tenodesis.

(b) Friction.

(c) Lumbosacral rhythm.

(d) Stability of the knee joint.

(e) Spurt muscles.

(f) Intervertebral disc.

(g) Line of gravity in 'Pes Planus' of the stance limb.

(h) Biomechanics of the Arches of Foot.

(i) Arcuate bundles.

(j) Axes and plane of the Elbow joint.

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August-2004

[KL 915] **Sub. Code : 5148**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(Revised/Modified Regulations)

Paper III — BIO–MECHANICS

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essay Questions : (2 × 15 = 30)

(1) Explain the analysis of Optimal posture in lateral view.

(2) Explain the Prehension activities of the hand.

II. Short notes on : (10 × 5 = 50)

(a) Anatomic pulley.

(b) Lumbar–Pelvic rhythm.

(c) 'Q' angle.

(d) Swing phase of the normal walking gait.

(e) Plane joint.

(f) Role of thoraco–Lumbar fascia in lifting.

(g) Claw Toes.

(h) General plane motion.

(i) Closed kinematic chain.

(j) Static stabilization of the dependent arm.

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August-2004

[KL 927] **Sub. Code : 5317**

BACHELOR OF PHYSIOTHERAPY DEGREE EXAMINATION.

Fourth Semester

(New Modified Regulations)

Paper III — BIOMECHANICS

Time : Three hours Maximum : 100 marks

Theory : Two hours and forty minutes Theory : 80 marks

MCQ : Twenty minutes MCQ : 20 marks

Answer ALL questions.

Draw suitable diagrams wherever necessary.

I. Essays : (2 × 15 = 30)

(1) Describe how muscles and ligaments interact to provide stability for the vertebral column.

(2) Explain the phases, and determinants of normal walking gait cycle.

II. Short notes on the following : (10 × 5 = 50)

(a) Centre of Gravity.

(b) Moment Arm.

(c) Hammer toes.

(d) Carrying angle.

(e) Locking mechanism of knee joint.

(f) Hook grip.

(g) Describe what would happen to the pelvis in the left unilateral stance, when the left hip abductors are paralysed and how is equilibrium maintained in this situation.

(h) Gomphosis joint.

(i) Push up.

(j) Metatarsal break.
