

February 2012

[LA 6157]

Sub. Code: 6157

**BACHELOR OF OCCUPATIONAL THERAPY EXAMINATION
SECOND YEAR**

**Paper III– BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on:

(2X20=40)

1. Describe the basic principles of joint design types of joints and joint function.
2. Define cardiac cycle. Describe the phases of cardiac cycle.

II. Write notes on:

(8X5=40)

1. Mechanical advantages
2. Carrying angle and its significance
3. Vital capacity
4. Screw home mechanism of knee
5. Supination and pronation twist.
6. Determinants of gait
7. Artificial respiration.
8. Ligaments of the superior radio ulnar joint

III. Short Answers:

(10X2=20)

1. Tennis elbow
2. Kyphosis
3. Calcaneal gait
4. Concurrent forces
5. motor unit
6. Reflex arc
7. Muscles of inspiration
8. Bunnel 's sign
9. Synergists
10. Q angle

[LB 6157]

AUGUST 2012

Sub. Code: 6157

SECOND YEAR BOT EXAM

**Paper – III BIOMECHANICS APPLIED ANATOMY
AND APPLIED PHYSIOLOGY**

Q.P. Code: 786157

Time: Three Hours

Maximum: 100 marks

(180 Min) Answer ALL questions in the same order.

I. Elaborate on:

**Pages Time Marks
(Max.)(Max.)(Max.)**

- | | | | |
|--|----|----|----|
| 1. Describe the Biomechanics of wrist joint and its Contribution in hand function. | 19 | 33 | 20 |
| 2. Define center of gravity and explain assessment of Center of gravity of human body. | 19 | 33 | 20 |

II. Write Notes on:

- | | | | |
|---------------------------------|---|---|---|
| 1. Ligaments of knee joint. | 3 | 8 | 5 |
| 2. Mechanism of Respiration. | 3 | 8 | 5 |
| 3. Intrinsic muscles of foot. | 3 | 8 | 5 |
| 4. Genurecurvatum. | 3 | 8 | 5 |
| 5. Effects of aging on posture. | 3 | 8 | 5 |
| 6. Hypertension | 3 | 8 | 5 |
| 7. Lung compliance. | 3 | 8 | 5 |
| 8. Function of Menisci. | 3 | 8 | 5 |

III. Short Answers :

- | | | | |
|---|---|---|---|
| 1. Synovial joint. | 1 | 5 | 2 |
| 2. Active insufficiency. | 1 | 5 | 2 |
| 3. MP joint capsule. | 1 | 5 | 2 |
| 4. Newton's Law of reaction. | 1 | 5 | 2 |
| 5. Muscles of expiration. | 1 | 5 | 2 |
| 6. Lordosis. | 1 | 5 | 2 |
| 7. Eccentric contraction. | 1 | 5 | 2 |
| 8. Stability factors of shoulder joint. | 1 | 5 | 2 |
| 9. Types of prehension. | 1 | 5 | 2 |
| 10. Genu valgum. | 1 | 5 | 2 |

[LC 6157]

FEBRUARY 2013

Sub. Code: 6157

SECOND YEAR BOT EXAM

**Paper III– BIOMECHANICS APPLIED ANATOMY
AND APPLIED PHYSIOLOGY**

Q.P. Code: 786157

**Time: Three Hours
(180 Min)**

Maximum: 100 marks

I. Elaborate on:

(2X20=40)

1. Describe the structure and function of the Patellofemoral joint.
2. Explain the structure and properties of heart muscles.

II. Write Notes on:

(8X5=40)

1. Classification of muscles
2. Atlanto axial joint mobility factors
3. Why should one use a cane ipsilaterally?
4. Functions of the meniscomfemoral ligaments
5. Mobility factors of the hip joint
6. Components of stance phase
7. Normal E.C.G.
8. Reciprocal Innervation.

III. Short Answers :

(10X2=20)

1. Arthrosis of hip joint
2. Lateral pelvic tilt
3. Mid Swing phase
4. Inversion of foot
5. Halux valgus
6. Metatarsal break
7. Intrinsic muscles of hand
8. Perturbation and its types
9. Ground reaction force
10. Angular velocity.

[LD 6157]

AUGUST 2013

Sub. Code : 6157

SECOND YEAR BOT EXAM

**Paper III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum : 100 marks

I. Elaborate on: (2x20 = 40)

1. Explain the determinants of Gait .
2. Explain the biomechanics of the spine .

II. Write Notes on: (8x5 = 40)

1. Effects of posture on aging
2. Intrinsic muscles of hand
3. Types of joints
4. Hypertension
5. Passive and active insufficiency
6. Phases of the gait cycle
7. Function of menisci
8. Why should hand tools be made with a pistol grip ?

III. Short Answers on: (10x2 = 20)

1. Trendelenburg's gait
2. Structures forming medial arch of the foot
3. Claw hand
4. Types of prehension
5. Types of planes
6. Collateral ligaments
7. Lung compliance
8. Cubitus valgus
9. Cadence
10. Mechanical advantage

SECOND YEAR BOT EXAM
Paper III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY

Q.P. Code: 786157

Time: Three hours

Maximum : 100 marks

I. Elaborate on: **(2x20 = 40)**

1. Describe in detail the structure and function of the extensor mechanism
2. Define cardiac cycle .Describe the phases of cardiac cycle.

II. Write Notes on: **(8x5 = 40)**

1. Annular pulleys and its function
2. Mechanism of respiration
3. Functions of Cardiac muscle
4. Flat foot
5. Oedema
6. Anterior pelvic tilt
7. Normal E.C.G
8. Biomechanics of spherical grip

III. Short Answers on: **(10x2 = 20)**

1. Spring ligament
2. Anatomic pulley
3. Anteversion of the femur
4. Screw home movement
5. Synaptic transmission
6. Q-angle
7. Rotator cuff
8. Alpha motor neuron
9. Torque
10. Kinetic chain

[LF 6157]

AUGUST 2014

Sub. Code : 6157

**SECOND YEAR BOT EXAM
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three Hours

Maximum: 100 marks

I. Elaborate on: **(2x20=40)**

1. Define Center of Gravity. Explain the methods used to assess the center of gravity of the human body.
2. Describe in detail with diagram the biomechanics of the Knee Joint.

II. Write Notes on: **(8x5=40)**

1. Artificial respiration
2. Intrinsic muscles of the foot
3. Lung Volumes
4. Winging of the scapula
5. Volar plate structure and function
6. CMC joint of the Thumb
7. Exchange of gases
8. Genu recurvatum

III. Short Answers on: **(10x2=20)**

1. Gluteus Medius Gait
2. Patello femoral joint
3. Autonomic Nervous system
4. Carrying angle
5. Khyphosis
6. Trigger Finger
7. Interrosei muscle function
8. Swing Phase
9. Double stance
10. Ball and socket joint

[LG 6157]

FEBRUARY 2015

Sub. Code : 6157

**SECOND YEAR BOT EXAMINATION
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain the biomechanics of shoulder joint abduction.
2. Describe the factors affecting respiration and effect of exercise on respiration.

II. Write notes on:

(8 x 5 = 40)

1. Cubital tunnel syndrome
2. Anatomic pulleys
3. Postural control and factors which maintain its stability
4. Plantar arches
5. Lateral pelvic tilt
6. Function of the cruciate ligaments
7. Ligaments of the wrist joint
8. Types of muscle action

III. Short answers on:

(10 x 2 = 20)

1. Hallux valgus
2. Housemaids knee
3. Nursemaids elbow
4. Popliteus muscle
5. Ankle synergy
6. Calcaneocubiod ligament
7. Unilateral stance
8. Types of grips
9. Coupling action
10. Waddling gait

[LH 6157]

AUGUST 2015

Sub. Code: 6157

B.O.T. DEGREE EXAMINATION

SECOND YEAR

**PAPER III – BIOMECHANICS APPLIED ANATOMY
AND APPLIED PHYSIOLOGY**

Q.P. Code: 786157

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 20 = 40)

1. Classify the joints of the Human body. Describe each with suitable examples.
2. Explain the dynamic stabilization of the Gleno humeral joint

II. Write notes on:

(8 x 5 = 40)

1. Ligaments of the knee joint.
2. Passive Insufficiency.
3. Swing phase of the gait cycle.
4. Normal ECG.
5. Scoliosis.
6. Neuro muscular junction.
7. Lung Volumes and Capacity.
8. Claw hand deformity.

III. Short Answers on:

(10 x 2 = 20)

1. Third class levers.
2. Cardiac output.
3. Synergists.
4. Isometric muscle contraction.
5. Carrying angle.
6. Trigger finger.
7. Proprioception.
8. Trendel Berg Gait.
9. Genu recurvatum.
10. Breath Sounds.

[LI 6157]

FEBRUARY 2016

Sub. Code : 6157

**SECOND YEAR BOT EXAMINATION
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: (2 x 20 = 40)

1. Classify the joints of the human body with suitable examples for each.
2. Describe and discuss ligaments of the knee joints and their functions.

II. Write notes on: (8 x 5 = 40)

1. Tenodesis grasp.
2. Types of levers in the human body.
3. Types of Power grip.
4. Flexors of the hip joint.
5. Costs of dynamic stability of the shoulder joint.
6. Types of Nerve fibres.
7. Lung volumes.
8. Functions of Frontal Lobe.

III. Short answers on: (10 x 2 = 20)

1. Claw hand deformity.
2. Cardiac Output.
3. Oedema.
4. Kinesthesia.
5. Tennis Elbow.
6. Ataxic Gait.
7. Hallux Valgus.
8. Hypotension.
9. Muscles involved in inspiration.
10. Trigger finger.

[LJ 6157]

AUGUST 2016

Sub. Code : 6157

**SECOND YEAR BOT EXAMINATION
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Describe the phases of the Gait cycle. Describe pathologic gait patterns.
2. Describe the gliding mechanism of extrinsic finger flexors.

II. Write notes on:

(8 x 5 = 40)

1. Reflex Action Reciprocal Innervation.
2. Describe the ligaments of the ankle.
3. Describe screw home mechanism of the knee.
4. Extensors of the hip joint.
5. Describe any one ball and socket joint in the human body.
6. Functions of the Frontal lobe.
7. Chemical control of respiration.
8. Isometric and Isotonic muscle contraction.

III. Short answers on:

(10 x 2 = 20)

1. Nurse maids elbow.
2. Rotator cuff muscle.
3. Muscles of depression of shoulder joint.
4. Kyphosis.
5. Anatomic Pulley.
6. Rigidity.
7. Stroke volume.
8. Asthma.
9. Hypertension.
10. Functional position of hand.

[LK 6157]

FEBRUARY 2017

Sub. Code : 6157

**BOT DEGREE EXAMINATION
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: (2 x 20 = 40)

1. Describe the different types of Prehension.
2. Describe the locking mechanism of the Knee joint.

II. Write notes on: (8 x 5 = 40)

1. Differentiate isometric and isotonic muscle contraction.
2. Injuries in the elbow joint.
3. Swing Phase of gait Cycle.
4. Types of Nerve Cells.
5. Action of the heart.
6. Artificial Respiration.
7. Muscles of Elevation of the shoulder joint.
8. Effects of Occupation and Recreation on Posture.

III. Short answers on: (10 x 2 = 20)

1. Anatomic pulleys.
2. Tri axial joints.
3. Rotator Cuff.
4. Systolic Blood Pressure.
5. Rigidity.
6. Bunnel's sign.
7. QRS complex.
8. Supinated foot.
9. Coxa Vara.
10. Synaptic junction.

[LL 6157]

AUGUST 2017

Sub. Code : 6157

BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2013-2014 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Describe the functional deficits that would occur in the event of paralysis of any five-muscle acting on the shoulder joint.
2. Effect of Age, Pregnancy and Recreation on Posture.

II. Write notes on: **(8 x 5 = 40)**

1. Functions of Patella at knee joint.
2. Factors affecting muscle function.
3. Compression and distraction injury at Elbow joint.
4. Carpal Tunnel syndrome.
5. Abnormal Muscle tone.
6. Effect of exercise on respiration.
7. Stance phase of gait cycle.
8. Cardiac Cycle.

III. Short answers on: **(10 x 2 = 20)**

1. Spring Ligament.
2. Ankle joint motion.
3. Abductors of hip joint.
4. Lumbar pelvic rhythm.
5. Clonus.
6. Second class lever.
7. Closed packed versus loose packed position of the joints.
8. Deep sensations.
9. Tidal volume.
10. Bronchitis.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 6157]

FEBRUARY 2018

Sub. Code : 6157

**BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2013-2014 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: (2 x 20 = 40)

1. Describe Knee joint motion including locking and unlocking mechanism at the Knee joint.
2. Describe structure of the Elbow joint including joint capsule and ligaments.

II. Write notes on: (8 x 5 = 40)

1. Precision handling.
2. Bony abnormality of Femur.
3. Advantages of Coraco humeral arch.
4. Distance and time variables in gait.
5. Ankle dorsiflexion and plantar flexion.
6. Effect of exercise on the heart.
7. Chemical control of respiration.
8. Superficial and deep sensation.

III. Short answers on: (10 x 2 = 20)

1. Sway envelope.
2. Mechanical advantage.
3. Arthrokinematics.
4. Differentiate scoliosis, kyphosis and lordosis.
5. Heart failure.
6. Asthma.
7. Stroke volume.
8. Sarcomere.
9. Genu recurvatum.
10. Muscles involved in reposition of thumb.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 6157]

AUGUST 2018

Sub. Code : 6157

**BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2010-2011 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Define Gait. Describe the phases and determinants of Gait.
2. Describe the biomechanics of Elbow joint.

II. Write notes on: **(8 x 5 = 40)**

1. Ligaments of knee joint.
2. Joints in the shoulder complex.
3. Stability factors in the vertebral column.
4. Classes of levers in the human body.
5. Arches of foot.
6. Cane use in painful hip conditions.
7. Types of muscle contraction.
8. Sagittal plane analysis of sitting posture.

III. Short answers on: **(10 x 2 = 20)**

1. Define force.
2. Mechanical advantage.
3. Tenodesis grasp.
4. Passive tension.
5. Delayed onset of muscle soreness.
6. Lateral epicondylitis.
7. Wattenberg's sign.
8. Anti-deformity position.
9. Nursemaid's elbow.
10. Action of lumbricals.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LO 6157]

FEBRUARY 2019

Sub. Code : 6157

**BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2010-2011 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. Describe the bio-mechanics of shoulder joint.
2. What is postural control? Describe the analysis of standing posture.

II. Write notes on: **(8 x 5 = 40)**

1. Define kinetics. Describe force & gravity vectors.
2. Describe Newton's Law's of motion.
3. Explain third class lever system with examples from human body.
4. Ligaments of hip joint.
5. Stability components of knee joint.
6. Joints in the ankle complex.
7. Kinematics and kinetics of elbow movement.
8. Anatomic pulleys.

III. Short answers on: **(10 x 2 = 20)**

1. Differentiate the action of soleus and gastrocnemius.
2. Differentiate scalar and vector quantities.
3. Force couple.
4. Synovial fluid.
5. Scoliosis and kyphosis.
6. Action of trapezes.
7. Congenital Talipes equino varus (CTEV).
8. Shunt and spurt muscles.
9. Functional position of hand.
10. Medial epicondylitis.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 6157]

AUGUST 2019

Sub. Code : 6157

**BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2010-2011 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 20 = 40)**

1. What is lever? Describe the different lever systems with suitable examples. Describe the lever systems in the human body.
2. Describe the biomechanics of Knee joint.

II. Write notes on: **(8 x 5 = 40)**

1. Describe kinematic variables.
2. Lumbopelvic rhythm.
3. Length – tension relationship of a muscle.
4. Types of joints.
5. Shoulder joint movements and the muscles contribution.
6. Biomechanics of pronation and supination in forearm.
7. Intrinsic muscles of the hand.
8. Position of line of gravity in the lower extremity joints in sagittal plane analysis.

III. Short answers on: **(10 x 2 = 20)**

1. Sway – back posture.
2. Pes caves and pes planus.
3. Angle of torsion.
4. Menisci.
5. Inter-vertebral disc.
6. Cadence.
7. Passive insufficiency.
8. Quadriceps lag.
9. Muscles of knee extension.
10. Precision.

THE TAMIL NADU Dr.M.G.R. MEDICAL UNIVERSITY

[LQ 6157]

FEBRUARY 2020

Sub. Code : 6157

**BOT DEGREE EXAMINATION
(Regulations for the candidates admitted from 2010-2011 onwards)
SECOND YEAR
PAPER III – BIOMECHANICS APPLIED ANATOMY AND APPLIED
PHYSIOLOGY**

Q.P. Code: 786157

Time: Three hours

Maximum: 100 Marks

I. Elaborate on: (2 x 20 = 40)

1. Define Center of gravity and explain assessment of Center of gravity of Human body.
2. Describe in detail the structure and function of the extensor mechanism of Fingers.

II. Write notes on: (8 x 5 = 40)

1. Screw home mechanism of knee.
2. Determinants of gait.
3. Atlanto-axial joint mobility factors.
4. Why should one use a cane ipsilaterally?
5. Reciprocal Innervations.
6. Why should hand tools be made with a pistol grip?
7. Mechanism of respiration.
8. Lung volumes and capacity.

III. Short answers on: (10 x 2 = 20)

1. Concurrent forces.
2. Bunnell's sign.
3. Newton's Law of reaction.
4. Stability factors of shoulder joint.
5. Lateral pelvic tilt.
6. Lung compliance.
7. Limb length discrepancy.
8. Spring ligament.
9. Coupling action.
10. Breath Sound.
