

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

[LP 6277]

AUGUST 2019

Sub. Code: 6277

**BPT DEGREE EXAMINATION**  
**(Regulations for the candidates admitted from 2017-2018 onwards)**  
**SECOND YEAR**  
**PAPER II – BIOMECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code : 746277*

**Time: Three hours**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Explain the details of joint classification with examples and add note on Joint receptors.
2. Describe the Kinetics and Kinematics of Knee joint. Add a note on applied anatomy of Knee Joint.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Angles of Hip joint.
2. Viscoelasticity.
3. Factors affecting muscle functions.
4. Scapula humeral rhythm.
5. Determinants of Gait.
6. Supinator twist & Pronator twist.
7. Anterior cruciate ligament.
8. Ground reaction force.
9. Pregnancy posture.
10. Supra humeral arch.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Avulsion.
2. Gomphosis.
3. Cubitus valgus.
4. Zona orbicularis.
5. Pes anserinus.
6. H zone.
7. Postural sway.
8. Stride length.
9. Trendelenburg gait.
10. Sacromere.

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

[LQ 6277]

FEBRUARY 2020

Sub. Code: 6277

**BPT DEGREE EXAMINATION**  
**(Regulations for the candidates admitted from 2017-2018 onwards)**  
**SECOND YEAR**  
**PAPER II – BIOMECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code : 746277*

**Time: Three hours**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Explain about Postural analysis and Postural deviations.
2. What is Arch? Explain the details of plantar arches.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Linear force system.
2. Length tension relationship.
3. Ligamentum Flavum.
4. Extensor mechanism of wrist & fingers.
5. Bursae around knee joint.
6. Subtalar Axis.
7. Meniscus.
8. Codman's paradox.
9. Sliding filament theory.
10. Sensory receptors.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Torque.
2. Proteoglycans.
3. Volar plate.
4. Housemaid's knee.
5. Woven bone.
6. Ligamentum teres.
7. Trigger finger.
8. Mechanical advantage.
9. Lister's tubercle.
10. Hoop stress.

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

**[LR 1220]**

**DECEMBER 2020  
(AUGUST 2020 EXAM SESSION)**

**Sub. Code: 6277**

**BPT DEGREE EXAMINATION  
SECOND YEAR**

**(New regulations for the candidates admitted from 2017-2018 onwards)**

**PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

***Q.P. Code : 746277***

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Describe the details of static and dynamic stabilization of Shoulder joint.
2. Explain the structure of configuration of Knee joint with factors contributing for its stability.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Stress and Strain.
2. Corocoacromial arch.
3. Muscles contribution to the arches.
4. Pelvic tilt.
5. Screw home mechanism.
6. Anatomical Pulleys.
7. Ideal posture.
8. Physiological valgus at knee.
9. Young Modulus.
10. 'T' tubules.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Ovoid joint.
2. Alar ligament.
3. Patella alta & baja.
4. Power grip.
5. Index plus foot & index minus foot.
6. Angle of wiberg.
7. Hallux rigidus.
8. Cross eyed patella.
9. Potential energy.
10. Chondrocytes.

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

[BPT 0921]

SEPTEMBER 2021  
(FEBRUARY 2021 EXAM SESSION)

Sub. Code: 6277

**BPT DEGREE EXAMINATION**  
**SECOND YEAR**  
(Regulations for the candidates admitted from 2017-2018 onwards)  
**PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**  
*Q.P. Code : 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Explain about the biomechanical properties of connective tissues.
2. Explain the structure configuration of hip joint in relation to weight bearing in unilateral and bilateral stance along with factors contributing for its stability.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Sensory receptors in muscle.
2. Supination and pronation twist.
3. Extensor Expansion.
4. Scapulo-humeral rhythm.
5. Concurrent force system.
6. Triangular Fibro-Cartilage Complex (TFCC).
7. Determinants of gait.
8. Intervertebral disc.
9. Patello-Femoral joint reaction force.
10. Osteokinematic and arthrokinematics.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Synergist.
2. Scaption.
3. Angle of Wiberg.
4. Lister tubercle.
5. Cadence.
6. Torque.
7. Patella baja.
8. Moment arm.
9. Fibrous joint.
10. Couple motion.

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

**[BPT 0122]**

**JANUARY 2022  
(AUGUST 2021 EXAM SESSION)**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY  
*Q.P. Code : 746277***

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Describe in detail the function and biomechanics of lumbar spine and also its Pathomechanics.
2. Give in detail the interaction between the spine, pelvis, hip, knee ankle and foot and upper limbs in gait.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Hand Function.
2. Importance of angles and curves in femur.
3. Elasticity and it's effects over joints.
4. Arches of foot and its biomechanics.
5. Comment on Osteo kinematics and Arthro kinematics.
6. Role of Scapulo Humeral Rhythm.
7. Optimal muscle length, comment on its efficiency.
8. Grip and grasp functions.
9. Abdominals in posture maintenance.
10. Elbow joints – its biomechanics.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Stride Length.
2. Pes Cavus.
3. Facet joints.
4. Opposition.
5. Arcuate lines.
6. Creeps phenomenon.
7. Convergent forces.
8. Line of gravity.
9. Joint reaction force.
10. Resting position of hand.

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

**[BPT 0622]**

**JUNE 2022  
(FEBRUARY 2022 EXAM SESSION)**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY  
Q.P. Code : 746277**

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on: (2 x 15 = 30)**

1. Describe the structure and function of plantar arches in detail.
2. Explain the biomechanical properties of connective tissues.

**II. Write notes on: (10 x 5 = 50)**

1. Ligamentum flavum.
2. Meniscus.
3. Sliding filament theory.
4. Bursae around knee joint.
5. Triangular fibro cartilage complex.
6. Osteokinematic and arthrokinematics.
7. Factors affecting muscle functions.
8. Insufficiency.
9. Patella femoral joint reaction force.
10. Linear force system.

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

1. Cadence.
2. Calcaneal gait.
3. Motor unit.
4. Thoracolumbar fascia attachment.
5. Torque.
6. Nucleus pulposus.
7. Second order lever.
8. Hooke's law.
9. Optimal length.
10. Q - angle.

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

**[BPT 1022]**

**OCTOBER 2022  
(AUGUST 2022 EXAM SESSION)**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY  
Q.P. Code : 746277**

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:** **(2 x 15 = 30)**

1. Describe the structure and function of Patello Femoral Joint.
2. Discuss in detail about structure and function of Shoulder Joint.

**II. Write notes on:** **(10 x 5 = 50)**

1. Composition of the connective tissue.
2. Loading of the foot.
3. Excitation - contraction coupling.
4. Compare the action of anconeus and triceps.
5. Rotator cuff stabilization.
6. Load deformation curve.
7. Explain patella as an anatomic pulley.
8. Pronation twist of tarsometatarsal joint.
9. Functional position of the wrist.
10. Effects of immobilisation.

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

1. Pesplanus.
2. Pelvic balance.
3. Common hip axis.
4. Tarsal canal.
5. Articularis genu.
6. Corset muscle.
7. Postural set.
8. Volar plate.
9. Junctura tendinae.
10. Optimal Posture.

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

**[BPT 0423]**

**APRIL 2023  
(FEBRUARY 2023 EXAM SESSION)**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR - (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code: 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Define Levers and explain the types of Levers pathomechanics and its mechanical advantage.
2. Explain in details about the Muscle functions and factors affecting the Muscle function.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Locking and unlocking mechanism of Knee Joint.
2. Supinator twist.
3. Trabecular system of Hip Joint.
4. Power grip.
5. Passive insufficiency.
6. Synovial Joint and its sub classification.
7. Parameters of gait.
8. Abnormal posture.
9. Pivot Joint.
10. Talocalcaneonavicular Joint.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Creep.
2. Mechanical advantage.
3. Torque.
4. Q angle.
5. Scaption.
6. Perturbation.
7. Vincula tentinum.
8. Isokinetic exercise.
9. Postural sway.
10. Bunnell's sign.

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

**[BPT 1123]**

**NOVEMBER 2023  
(AUGUST 2023 EXAM SESSION)**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR - (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code: 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Discuss in detail about the structure and function of the tibio-femoral joint.
2. Define Prehension. Explain in detail about precision handling with examples.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Arches of foot.
2. Importance of angles and curves in femur.
3. Determinants of gait.
4. Lumbar-pelvic rhythm.
5. Functions of menisci.
6. Optimal posture.
7. Pulled elbow.
8. Types of lever.
9. Supra humeral arch.
10. Load deformation curve.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Fast-twitch fibres.
2. Mechanical advantage.
3. Pelvic balance.
4. Hammer toe.
5. Carrying angle.
6. Patella alta.
7. Ballistic movement.
8. Define Torque.
9. Bursae.
10. Tarsal canal.

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

**[BPT 0824]**

**AUGUST 2024**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR - (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code: 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Discuss the factors affecting the mobility and stability of Vertebral column.
2. Discuss the dynamic stability of Glenohumeral Joint.

**II. Write notes on:**

**(10 x 5 = 50)**

1. High steppage gait.
2. Scoliosis.
3. Anterior cruciate ligament.
4. Tonic and Phasic muscles.
5. Chondromalasia patella.
6. H zone.
7. Loading of the foot.
8. Composition of the connective tissue.
9. Pes cavus.
10. Convex-concave rule.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Newton's second law.
2. Muscle Tension.
3. Pinch and grasp.
4. Coxa vara.
5. Perturbation.
6. Metatarsal break.
7. Sarcomere.
8. Hammer toes.
9. Multifidus muscle.
10. Scapulohumeral Rhythm.

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

**[BPT 0225]**

**FEBRUARY 2025**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR - (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code: 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Describe the structure and functions of Plantar Arches in detail.
2. Discuss in detail about joint classification with examples and add note on Joint Receptors.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Angles of Hip joint.
2. Triceps surae.
3. Pronation twist.
4. Semilunar cartilage.
5. Knock knee.
6. Winging of scapula.
7. Lumbosacral angle.
8. Shoulder joint stability.
9. Pivot joint.
10. Close packed position.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Cubitus valgus.
2. Pes anserinus.
3. Force.
4. Gomphosis joint.
5. Deltoid ligament.
6. Equilibrium.
7. Golgi - tendon organs.
8. Avulsion.
9. Law of Inertia.
10. Lordosis.

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

**[BPT 0825]**

**AUGUST 2025**

**Sub. Code: 6277**

**BACHELOR OF PHYSIOTHERAPY DEGREE COURSE  
SECOND YEAR - (Regulations from 2017-2018 onwards)  
PAPER II – BIO-MECHANICS, APPLIED ANATOMY & KINESIOLOGY**

*Q.P. Code: 746277*

**Time: Three hours**

**Answer ALL Questions**

**Maximum: 100 Marks**

**I. Elaborate on:**

**(2 x 15 = 30)**

1. Posture evaluation in relation to axis and planes.
2. Describe in detail of hand function and its applied anatomy.

**II. Write notes on:**

**(10 x 5 = 50)**

1. Pelvic tilt.
2. Scoliosis.
3. Open kinematic chain.
4. Newton's law.
5. Painful arc syndrome.
6. Joint distraction in a linear force system.
7. Spurt and shunt muscle.
8. Talonavicular joint.
9. Osteokinematics and Arthrokinematics.
10. Static stabilization of shoulder joint.

**III. Short answers on:**

**(10 x 2 = 20)**

1. Lever.
2. Stress.
3. Posture.
4. Gravity.
5. Synergies.
6. Force arm.
7. Agonist.
8. Antagonist.
9. IVDP.
10. Feiss line.

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