[LP 0819] AUGUST 2019 **Sub. Code: 2464**

BACHELOR IN PROSTHETICS AND ORTHOTICS
(New Syllabus 2017-2018)

SECOND YEAR

PAPER IV – BIOMECHANICS - II

Q.P. Code: 802464

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. What is gait? Explain about features of gait and gait parameters.
2. Explain about Trans femoral gait analysis and deviation.
3. Explain about biomechanical principle of KAFO and FRO.

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

1. Explain about biomechanics of IC socket and socket force analysis.
2. Explain about three, four and five point pressure system.
3. Explain about KAFO gait deviation due to pathological condition.
4. Explain about types of gait analysis.
5. Explain about through knee socket force analysis.
6. What an EMG? Role of EMG in pathological condition.
7. Types of orthotic knee joints.
8. Biomechanics of energy storing foot.

III. Short answers on: **(10 x 3 = 30)**

1. Biomechanical discrepancies of Scissoring gait.
2. Define relation between pressure and area.
3. Step length and stride length.
4. KAFO Alignment Procedure.
5. Waddling gait.
6. Rheumatoid arthritis knee biomechanics.
7. Electromyography.
8. Kinetics and kinematics.
9. Foot orthosis.
10. Degree of freedom.

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

[AHS 0321] **MARCH 2021** **Sub. Code: 2464**

(AUGUST 2020 EXAM SESSION)

BACHELOR IN PROSTHETICS AND ORTHOTICS

SECOND YEAR (Regulation 2017-2018)

PAPER IV – BIOMECHANICS - II

Q.P. Code : 802464

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Explain about effects of Floor Reaction Orthosis in CP children.
2. Explain about instantaneous centre of rotation in prosthetic polycentric knee joint.
3. Explain about Through knee biomechanics and alignment techniques.

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

1. Explain about medial whip and lateral whip with causing factor.
2. Explain about joint forces during and stance phases.
3. Biomechanics of prosthetic hip joint.
4. Biomechanics of HKAFO.
5. Biomechanics of energy storing foot.
6. Explain about Types of orthotic hip joint.
7. Kinematics of anatomical knee joint.
8. Placement of COG in Trendelenburg gait.

III. Short answers on: **(10 x 3 = 30)**

1. Torsional stress.
2. Biomechanics of safety knee joint.
3. Explain about cadence and velocity in gait.
4. How Transfemoral prosthesis aligned for voluntary control of knee?
5. What are the advantage of carbon fibre in KAFO?
6. Step length and stride length.
7. What is three point and four point gait?
8. Why the abduction tendency more common in trans femoral stump?
9. Vaulting.
10. Energetics of walking.

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

[AHS 0222] **FEBRUARY 2022** **Sub. Code: 2464**
(AUGUST 2021 EXAM SESSION)

BACHELOR IN PROSTHETICS AND ORTHOTICS
SECOND YEAR (Regulation 2017-2018)
PAPER IV – BIOMECHANICS - II
Q.P. Code : 802464

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Explain about gait cycle and gait parameters.
2. Explain about biomechanics of knee orthosis for osteoarthritis knee joint.
3. Biomechanical principle of HKAFO and KAFO.

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

1. TT gait deviations.
2. Biomechanics of quadrilateral socket.
3. Explain about different types of crutch gait.
4. Biomechanical principle of correcting genu varum and valgum.
5. Explain about closed and open kinematic chain.
6. Biomechanics of safety knee joint.
7. Explain about biomechanical forces on AFO by altering trim lines.
8. Gait deviation using foot orthosis.

III. Short answers on: **(10 x 3 = 30)**

1. Define gait and pathological gait.
2. Advantage of pyramid alignment system.
3. Four point pressure system.
4. Biomechanical Forces of FRO.
5. Bony lock in IC socket.
6. Windlass mechanism.
7. What is mal- alignment?
8. Through knee prescription principle.
9. Biomechanics of SACH foot.
10. Biomechanical forces in MAS socket.

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

[AHS 0423] **APRIL 2023** **Sub. Code: 2464**

BACHELOR IN PROSTHETICS AND ORTHOTICS
SECOND YEAR (Regulation 2017-2018 onwards)
PAPER IV – BIOMECHANICS II
Q.P. Code: 802464

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. Mechanical Characteristics of Bone and Muscle.
2. Explain in detail Instrumented GAIT Analysis.
3. GAIT Deviations in Trans Tibial Prosthesis.

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

1. Biomechanical Principals of HKAFO.
2. Force distribution in Symes Prosthesis.
3. Biomechanics of Ankle Foot Orthosis (AFO).
4. Function of Ligaments and Muscle.
5. Whip and Circumduction gait deviation.
6. Function of Knee cap in KAFO.
7. Merits and demerits of Polycentric Knee joint.
8. Trans femoral Prosthetic Socket Design variants.

III. Short answers on: **(10 x 3 = 30)**

1. Kinetics and Kinematics.
2. Pathological gait deviation in Cerebral Palsy.
3. Define Genu-recurvatum.
4. Gait benefits in Carbon fiber foot pieces.
5. Microprocessor Knee joint.
6. Foot Slapping gait deformity.
7. Lateral Trunk bending gait deviation.
8. Advantages of pyramid alignment system.
9. Force distribution in SMO.
10. Advantages of quadrilateral socket design for TF amputee.

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