જગ્યાનું નામ: લેક્ચરર પ્રોસ્થેટીક એન્ડ ઓર્થોટીસ્ટ,વર્ગ-૨ (જાહેરાત ક્રમાંક.૧૩/૧૮-૧૯)

કુલ પ્રશ્નો:૩૦૦	પ્રાથમિક કસોટીનો અભ્યાસક્રમ કુલ ગુણ -૩૦૦
	Part-I
માધ્યમ: ગુજરાતી	સામાન્ય અભ્યાસ ગુણ -૧૦૦
૧	ભારતની ભૂગોળ- ભૌગોલિક, આર્થિક, સામાજિક, કુદરતી સંસાધન અને વસ્તી અંગેની બાબતો- ગુજરાતના ખાસ સંદર્ભ સાથે
૨	ભારતનો સાંસ્કૃતિક વારસો- સાહિત્ય, કલા, ધર્મ અને સ્થાપત્યો- ગુજરાતના ખાસ સંદર્ભ સાથે
૩	ભારતનો ઇતિહાસ - ગુજરાતના ખાસ સંદર્ભ સાથે
૪	ભારતની અર્થવ્યવસ્થા અને આયોજન
૫	<u>ભારતીય રાજનીતિ અને ભારતનું બંધારણ:</u> (૧) આમુખ (૨) મૂળભૂત અધિકારો અને ફરજો (૩) રાજ્યનીતિના માર્ગદર્શક સિદ્ધાંતો (૪) સંસદની રચના (૫) રાષ્ટ્રપતિની સત્તા (૬) રાજ્યપાલની સત્તા (૭) ન્યાયતંત્ર (૮) અનુસૂચિત જાતિ, અનુસૂચિત જનજાતિ અને સમાજના પછાત વર્ગો માટેની જોગવાઈઓ (૯) એટર્ની જનરલ (૧૦) નીતિ આયોગ (૧૧) પંચાયતી રાજ (૧૨) નાણા પંચ (૧૩) બંધારણીય તથા વૈધનિક સંસ્થાઓ- ભારતનું ચૂંટણી પંચ, સંઘ લોક સેવા આયોગ, રાજ્ય લોક સેવા આયોગ, કોમ્પ્ટ્રોલર એન્ડ ઓડિટર જનરલ; કેન્દ્રીય સતર્કતા આયોગ, લોકપાલ તથા લોકાયુક્ત અને કેન્દ્રીય માહિતી આયોગ
૬	સામાન્ય બૌદ્ધિક ક્ષમતા કસોટી
૭	સામાન્ય વિજ્ઞાન, પર્યાવરણ અને ઈન્ફર્મેશન એન્ડ કોમ્યુનિકેશન ટેકનોલોજી
૮	ખેલ જગત સહિત રોજબરોજના પ્રાદેશિક, રાષ્ટ્રીય અને આંતરરાષ્ટ્રીય મહત્વના બનાવો

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Post: Prosthetics and Orthotics , Lecturer Class –II in Government College (Advt.No.13/18-19)

Total Questions:300 Syllabus of Preliminary Test Total Marks-300

Part-I

Medium: Gujarati General Study Marks- 100

1	Geography of India- Physical, Economic, Social, Natural Resources and population related topics- with special reference to Gujarat
2	Cultural heritage of India- Literature, Art, Religion and Architecture- with special reference to Gujarat
3	History of India with special reference to Gujarat
4	Indian Economy and Planning
5	Indian Polity and the Constitution of India: (1) Preamble (2) Fundamental Rights and Fundamental Duties (3) Directive Principles of State Policy (4) Composition of Parliament (5) Powers of the President of India (6) Powers of Governor (7) Judiciary (8) Provisions for Scheduled Castes, Scheduled Tribes and backward classes of the society (9) Attorney General (10) NITI Aayog (11) Panchayati Raj Institutions (12) Finance Commission (13) Constitutional and Statutory Bodies: Election Commission of India, Union Public Service Commission, State Public Service Commission, Comptroller and Auditor General; Central Vigilance Commission, Lokpal and Lokayukta, Central Information Commission
6	General Mental Ability
7	General Science, Environment and Information & Communication Technology
8	Daily events of Regional, National and International Importance including Sports

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Part-II Syllabus Of Concerned Subject

(Prosthetics and Orthotics)

Medium: English **Questions:200**

Marks: 200

1. ANATOMY

Histology. Embryology. **Thorax:** Cardio – Vascular System, Respiratory system, Abdomen, Musculo Skeletal Anatomy**. Upper and Lower Extremity:** Osteology, Soft parts, Joints. **Trunk & Pelvis:** Osteology, Soft tissue, Head and Neck.

2. PHYSIOLOGY

General Physiology, Blood, Nerve Muscle Physiology, Cardiovascular System, Respiratory System, Nervous System, Kidney and micturition Integumentary system, Endocrinology, Nutrition & Metabolism.

3. MATERIAL SCIENCE

Metal & Alloys: Fundamentals of metals and alloys both ferrous and nonferrous. Properties, testing and inspection of metals and alloys, heat treatment of metals. Powder metallurgy, surface coating of metals.

Wood: Wood, types, seasoning, preservation, lamination properties and adhesives for Wood. Wood work. Pattern making and making of various kinds of joints.

Leather: Leather, types, tanning, preservation, lamination, properties and adhesives for Leather.

Fabric: Fabric types, properties, utilization, selection and quality control. Polymers & composite materials: Introduction to Plastics, type of plastics and molecular structures.

Relationship of properties to structures. Monomers, Polymers, additives, Mechanical properties, effect on properties of method of production. Fabrication processes, Effects of fabrication, process, micro structural changes, shrinkage and other degradation during processing, environmental effects. Thermoforming plastics, their fabrication process, thermosetting plastics and fabrication process Composite materials and

their uses-Resin : Acralyic And Polyster. Elastomers, H.D.P.E. PP, PP-CP, Visoelastic behaviour of plastics. Introduction to fiber reinforced plastics. Introduction to and their processing especially various techniques of moulding and lamination. Joining of plastics, welding, adhesives and their effect on structure and plastics properties.

Foams: Different types of foams used in P&O especially Latex, Polyurethane, polyethylene and other kind of rigid/semi rigid/ flexible foams. Plaster of Paris & Silicon and its application procedure in Prosthetic & Orthotic techniques.

4. WORKSHOP TECHNOLOGY

Introduction to bench work, hand tools, measuring tools and instruments. Equipment for mass production, introduction to lathe machine and it's operation, milling machine and its operations, tooling, attachment, Shaping machine and its uses. Grinding machine, Drilling Machine Abrasive machine etc. Special tools and equipment used in fabrication of orthoses and prostheses. Compressors, Vacuum Pumps and Dust Collection Equipments, Cutting Tools (Chisels, Saws and Metal Cutters), Pneumatic Tools, Power Cutting tools, Workshop Safety & Hazards and Care, Mechanical working of metals such as steel and aluminum. Fundamental of riveting, soldering, brazing and welding.

5. APPLIED MECHANICS AND STRENGTH OF MATERIALS

General Mechanics: Definition of Mechanics, Foundation material on Units, dimensional homogeneity, scalar and vector quantities, Co-ordinate systems, Newton's laws. Resolution and summation of forces and moments in two and three Dimensions, equivalent force systems, free body diagrams, equations of Equilibrium, plans and space frame analysis. Parallel and non- parallel Forces, torque. Linear and angular motion, uniform acceleration, friction, inertia, moment of inertia, dynamic equilibrium (translation/rotation), Energy, momentum.

Simple stress & Strain: Definition of stress and strains, factor of safety stress, modulus of elasticity, longitudinal strain and internal strains.

Possion's ratio etc. stress and strain curve, statement of formulae relating between different modules, simple problems to understand the above principles of composite bars-formula relating to loads and strains in individual members simple to understand the above relations.

6. ENGINEERING DRAWING:

Introduction, General Principles and Fundamentals, Design calculations and its applications for Prosthetics & calculation Orthotics devices. Sketching for preparing assembly, workshop drawing. Various parts and Components used in prosthetics and orthotics, Basic idea of design analysis, itemisation empiricism, approximation and synthesis. Detail diagrams of all kind orthoses, prostheses and mobility aids.

7. BIOMECHANICS

Basic Concepts in Biomechanics: Kinematics and Kinetics, Joint structure and Function, Biomechanics of normal foot, pathological foot, foot arches, normal and surgical footwear. Human Movements, Joint Force Analysis, Human locomotion and Gait, Through knee Biomechanics, Trans Femoral Prosthetics Biomechanics, Gait deviation, Above knee Orthotics Biomechanics.

8. PROSTHETIC SCIENCE

Introduction to Prosthetics, definitions of various terminologies Historical Development in Lower Extremity Prosthetics in India and abroad. **Prosthetic Feet, Partial Foot, Syme's**: Various types of Symes Prosthesis, Prosthetic components, Prescription criteria, Principles. Materials used for Symes prosthesis, casting techniques. Cast modification. Fabrication Technique for Symes (P.T.B. type) prosthesis. Fabrication Technique for

conventional Symes prosthesis. Trans Tibial. Gait Deviations and Analysis, Knee Joints, Hip Joints, Through Knee Prosthesis, Trans Femoral Prosthesis. Endoskeleton/modular. Control systems. Upper limb prosthetics. Partial Hand. Wrist Disarticulation. Trans Radial. Fabrication techniques. Trans Humerus. Shoulder Disarticulation. Hip Disarticulation

Prosthesis. Bilateral Stubbies. Bilateral Prosthesis. Trans Lumber Prosthesis (Sitting and Standing), Prosthesis for Child Amputee, Prosthesis for Congenital anomalies, Prosthesis adaptation for sports and recreation, Immediate post surgical fittings,Check-out Procedures.

8. ORTHOTIC SCIENCE

Introduction to Orthotics, definitions of various terminologies, History of Orthoses in India and abroad. Various materials used in Orthotics. Different types of Orthoses, Shoe Modification, AFO (Ankle foot orthosis), Club foot Orthosis, **Above knee Orthotics:** Types of knee & Hip joints. **Orthotics Components:** Prescription principles of various types of Knee Orthoses (KO), Knee Ankle foot Orthoses (KAFO), Hip Knee Ankle foot Orthoses (HKAFO). RGO & ARGO Orthoses All types of K.A.F.O., H.K.A.F.O. FRO, RGO & ARGO etc. and also Orthoses for management of C.D.H., C.P., Paraplegics, Legg Calve perthes diseases, Spina Bifida, Leprosy and Hemiplegia etc. **Fabrication:** Cast and measurement techniques, appropriate selection of materials and components, cast modification, fabrication and alignment technique, using of different technologies – its advantages and disadvantages, Accommodation of limb length discrepancy while designing orthosis, Gait analysis and check out procedures. Control systems. Upper Limb Orthotics. All types of Hand Orthoses, Wrist Hand Orthoses, Elbow Orthoses, Shoulder Elbow Wrist Hand Orthoses & Pelvic Shoulder Elbow Wrist Hand Orthosis. Measurement/casting and Fabrication of P.S.E.W.H.O, S.E.W.H.O, Immobilization/ mobilization, Appliances for flail elbows. All types of fracture Orthoses, Temporary splinting, Feeder and other assistive appliances. **Spinal Biomechanics. Spinal Orthoses. Cervical Orthoses. Thoraco Lumbo Sacral Orthoses.** Orthoses for sports injury, Reciprocating Gait Orthoses (RGO), Hip Guidance Orthoses(HGO), Fracture Cast Bracing, Swivel walker, orthopodium/ Parapodium. Weight relieving orthoses, Extension orthoses or Ortho-prostheses, PTB. orthoses, Silicone Cosmetic prosthesis.

9. PATHOLOGY

Introduction to pathology, basic mechanism of health and disease, clarification of disease. Inflammation – Acute and Chronic inflammation. Hemodynamic disorders, thrombo embolic disease & shock. Ischemic, necrosis, thrombosis, embolism, Infarcation, shock. Gangrene. Thromboangitis obliterans. Neoplasia. Hypersensitivity diseases and immunity. Genetic disorders. Nerurovascular diseases. Metabolic disorders. Disorders of blood. Constituents of blood and bone marrow, Regulation of hematopoiesis. Anemia: Classification, clinical features & lab diagnosis.

10. ORTHOPAEDICS & AMPUTATION SURGERY

Introduction, Principles of Orthopaedics. Common investigative procedures. Traumatology. Inflammatory and Degenerative Conditions. Disease of Bones and Joints. Congenital Deformities. Acquired Deformities. Cervical and Lumbar Pathology. Regional Conditions. **Hip:** Outline of Dislocations and subluxations & dysplasia. **Knee:** Outline of Meniscal tears, dislocation of patella, Ligamentous injuries. **Ankle & foot:** Outline of partial and total ligamentous injuries Sprain Heel and foot deformities. **Shoulder:** Outline of Recurrent dislocation, Bicipital tendinitis and periarthritis. **Elbow and forearm:** Outline of Cubitus varus and valgus, Madelung's deformity, Tennis elbow, Volkmann's contracture, Dupuytren's disease, De Quervain's disease, entrapment neuropathies. **Wrist & Hand:** wrist drop, Tenosynovitis, mallet finger, carpal tunnel syndrome, claw hand. **Specific Disorders:** Leprosy, Burns, Tumors – Benign & malignant, Tuberculosis & Perthes Disease, AVN (Full) Peripheral Nerve Injuries, Congenital anomalies Muscular Dystrophy etc. Sports injuries and their management.

Amputation Surgery: Indications/causes, General Principles, Types of amputation. Individual's Preparation for prosthesis. Ideal stump. Preoperative, operative and postoperative prosthetic management techniques in general. Amputation surgery in lower and upper limbs, stump refashioning and amputation revision Amputation in special

circumstances, like in infants and children, Congenital limb deficiencies and its universal classification, ischemic limbs, elderly persons, malignancy and Diabetes. Osteointegration and Osteogenesis imperfecta. Conginetal anomalies, podiatery, burns.

11. PHYSICAL MEDICINE AND REHABILITATION

Psychology & Social work: Introduction to Psychology, Outline of Psychology and behavior, Intelligence and abilities, Learning and Remembering, Psychological Development, Cognitive Processes, Personality, Moral Development, Psychological aspect of disability. Introduction to Sociology and outline of Society, definitions, Outline of Social works, Nature of Social organization, types of organizations. **Disability & Development:** Introduction to impairment, disability and handicap. Introduction to disability issues, Government schemes and initiatives, legislation and UNCRPD Local resources available and referral.

Physiotherapy and Occupational Therapy: Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator - supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights. Normal Posture, Movements, Traction, Muscle Testing. Aims and scope of various biomechanical modalities used in Occupational Therapy. Child development in brief.

Physical Medicine and Rehabilitation: Concept of Total Rehabilitation, Rehabilitation team and role of each member of the team. Introduction to Physical Medicine, Principles of clinical examinations, diagnosis and treatment. Different aspects of physical medicine and rehabilitation. Rehabilitation aspects of visually handicapped, hearing handicapped and mentally retarded and disability evaluation. Introduction to Health care System, Rehabilitation in Health care, rehabilitation under various ministries, Institute based rehabilitation (IBR) and Community Based Rehabilitation (CBR). Specific disorders. Infections – Prevention & control. Outlines of pathology of bone diseases, infections, trauma, &

growth disturbances. Disease of joints, soft tissue and skin. Neuromuscular diseases. Sports Injuries.

12. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

Electricity: Basic Concepts. Resistors, Transformers, Semi-Conductors, Amplifiers, Feed Back, Measurements, Myoelectrodes, Electrical, Bio-Electricity.

13. P&O WORKSHOP MANAGEMENT

Principles of Administrative and Management structure, Industrial Management, Definition of Organization. Principles of good organisation, type of Organisational setup Workshop Administration and management. Material Management. Safety. Planning: Planning of Prosthetics and Orthotics Workshop all types of various scales. Construction. Human resource management & Environmental Science.

14. MOBILITY AND REHABILITATION AIDS

Mobility and Walking aids. Developmental aids. Molded seats. Wheelchair. Other types: Introduction: Motorized wheelchair, tricycle and motorized tricycle, modified two wheeler for mobility. Gait Training with various walking aids, Installation/ fabrication of Parallel bars. Self help devices: Special gadgets to assist in activities of daily living (A.D.L.) – assistive device for SCI patients, stroke patients etc.

15. RESEARCH METHODOLOGY

Introduction to Biostatistics and Research methodology, Types of research & research approaches, Research problem, Research design, Sampling Design, Measurement & scaling techniques. Methods of data collection. Sampling fundamentals, need for sampling, Types of analysis. Basic concepts concerning testing of hypothesis.

16. Current Trends and Recent Advancements in Prosthetics and Orthotics.