

Faculty of Health Sciences (FOHS)
Syllabus for PhD Entrance Test (PET)

❖ SPORTS SCIENCE AND MANAGEMENT

Unit 1: Anatomy and Exercise Physiology

Anatomical Positions and Movements, Structure and Function of Cell, Cardiovascular System - The Heart, Vascular System, Blood, Respiratory System - Pulmonary Ventilation, Pulmonary Volumes, Pulmonary Diffusion, Transport of Oxygen and Carbon Dioxide in the Blood, Gas Exchange, Musculoskeletal System—Properties of Muscles, Types of Muscles and Bones, Anatomy of Skeletal Muscle, Tendons, Muscle Fiber Contraction, Muscle Fiber Types, Endocrine System - Endocrine Glands and Their Hormones, Neuromuscular System - Structure and Function of the Nervous System, Central Nervous System, Peripheral Nervous System, Neuromuscular Junction, Bioenergetics and Muscle Metabolism – Glycolysis, Kerbs Cycle and Electron Transport Chain, Fatigue, Muscle Soreness and Recovery, Effect of Exercise on Body Systems.

Unit 2: Kinesiology and Sports Biomechanics

Planes and Axes of Movement, Joints and Levers in Human Body, Mechanical Analysis of Fundamental Movements, Mechanical Analysis of Sports Technique, Work, Power and Energy, Kinetics (Linear and Angular) - Force, Torque and Moment of Force, Laws of Motion, Muscle Angle of Pull, Impulse, Momentum, Kinematics (Linear and Angular) - Distance, Displacement, Speed, Velocity, Acceleration, Projectile Motion, Vectors, Scalars, Fluid Mechanics - Buoyancy, Drag, Lift, Magnus Effect, Aerodynamics, Hydrodynamics, Spin.

Unit 3: Sports Psychology

Learning Process and Theories of Learning, Personality and Sports, Personality Theories, Motivation – Approaches, Theories, Achievement Motivation and Competitiveness, Feedback, Reinforcement, and Intrinsic Motivation, Arousal, Stress, and Anxiety, Diversity and Inclusion, Team Dynamics and Cohesion, Leadership and Communication, Imagery, Self-confidence, Goal Setting, Aggression, Concentration

Unit 4: Sports Training

Principles of Training, Health Related Physical Fitness, Skill Related Physical Fitness, Training – Strength, Endurance, Flexibility, Speed, Agility, Plyometric, Warmup and Stretching, Training Load, Volume, Intensity, Specificity, Rest Interval, Frequency, Density, Adaptation, Overload, Overtraining, Periodization, Short term plan, Annual Plan, Supercompensation, Detraining and Retraining

Unit 5: Test, Measurement and Evaluation

Concepts in Tests and Measurements, Nature of Measurement and Evaluation, Purposes of Measurement, Testing and Evaluation, Validity, Reliability and Objectivity of test, Norm-Referenced Reliability and Validity, Criterion-Referenced Reliability and Validity, Fitness Test Batteries, Developing Questionnaires, Measuring - Aerobic Capacity, Body Composition, Muscular Strength and Endurance, Flexibility, Speed, Agility and Reaction Time, Balance (Static and Dynamic) and Physical Activity, Human Performance Laboratory, Assessment of Sport Skills and Motor Abilities, Psychological Measurements in Sports and Exercise, Planning, Constructing, Administering, Scoring and Analyzing the Test.

Unit 6: Sports Management

The World of Sports and its Business Ecosystem, Stakeholders, Sports Marketing, Sports Sponsorship, Endorsement, Branding, Sports Broadcasting, Media and Sports, Fan Engagement, Sport Governance, SWOT Analysis, Performance Management System, Scouting and Identification of Talent, Brand Marketing, Human Resource Management in Sports,

Unit 7: Sports Nutrition

Macronutrients – Carbohydrate, Protein and Fat, Micronutrients – Vitamins and Minerals, Water, Electrolytes, and Fluid Balance, Balanced Diet, Ergogenic Aids, Factors Affecting Nutrition Needs, Nutrition Plans - Sports Specific, Athlete Specific, Gender Specific, Age Specific, Eating Disorders in Athletes, Weight Management, Fueling Before, During and After Exercise.

Unit 8: Physical Activity and Health Promotion

Health and Its Determinants, Physical Inactivity Versus Physical Activity, Role of Physical activity in Growth and Development, Physical Assessment and First Aid Techniques, Types of Injury, Common Sports Injuries and Therapeutic Measures, Tissue Healing, Reducing Risk of Injury and Re-injury, Physical Activity and Mortality, FITT (Frequency, Intensity, Time and Type) Principle, PRICE (Protection, Rest, Ice, Compression and Elevation) Principle, Physical Activity and Prevention of Diseases, Physical Activity and Postural Deformities

Unit 9: Research and Statistics in Sports

Types of Research, Research Process, Preparation of Research Proposal, Types of Research Design, Sampling Techniques, Ethical Issues in Research

Descriptive Statistics and Inferential Statistics, Central Limit Theorem, Measures of Central Tendency, Measures of Variability, Normality of the Data, Probability, Hypothesis Testing – Types of Hypothesis, Level of Significance, Type 1 and Type 2 Error, Power of the Test, p-value.

Sample Questions:

1. Flexion and extension occur around

- (A) Medio-lateral axis
- (B) Anterior-posterior axis
- (C) Vertical axis
- (D) Sagittal axis

2. The red muscle fibres contain

- I. High content of glycogen.
- II. Higher myoglobin content.
- III. Better for aerobic work.
- IV. Better for anaerobic work

Find the correct combinations.

Codes:

- (A) I and II
- (B) I and III
- (C) II and III
- (D) II and IV

3. Match List – I with List – II and select the correct answer from the code given below:

List – I

List – II

- | | |
|--------------------------|---------------------|
| I. Inverted U hypothesis | 1. Achievement |
| II. Aggression | 2. Autocratic style |
| III. Leadership | 3. Anxiety |
| IV. Motivation | 4. Instrumental |

Codes:

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (A) | 1 | 2 | 3 | 4 |
| (B) | 4 | 3 | 1 | 2 |
| (C) | 2 | 1 | 4 | 3 |
| (D) | 3 | 4 | 2 | 1 |