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**SYLLABUS FOR WRITTEN TEST FOR ADMISSION TO Ph.D COURSE**  
**(Physical Education) 2020-21**

**RESEARCH PROCESS AND STATISTICAL TECHNIQUES IN PHYSICAL EDUCATION**

- UNIT-I**      **INTRODUCTION TO RESEARCH**
- 1.1      Meaning, need and nature
  - 1.2      Types of research : Basic(Fundamental), Applied and Action research
  - 1.3      Identifying a research problem
  - 1.4      Criteria in selecting a research problem
  - 1.5      Stating the research problem
  - 1.6      Formulating, presenting and listing hypothesis
  - 1.7      Delimitation and limitation of a problem
- UNIT-II**      **LITERATURE SEARCH**
- 2.1      Reason for surveying related literature
  - 2.2      Major literature resources
  - 2.3      Documentation over-view
  - 2.4      Library sources
  - 2.5      Research reviews
  - 2.6      Card catalogue indices-physical education indices
- UNIT-III**      **DESCRIPTIVE METHODS OF RESEARCH**
- 3.1      Historical research
    - . Meaning, nature and scope of historical research
    - . Sources of historical materials (primary and secondary)
    - . Evaluation of historical material-internal and external criticism-general Principles of criticism
    - . Historical hypothesis
    - . Pitfalls in historical research
  - 3.2      Philosophical Research
    - . Need, nature and techniques of thinking process
    - . Methods of philosophy
    - . Analyzing philosophical research problem
    - . Inductive and deductive reasoning
  - 3.3      Survey and case study
    - . Meaning, need and scope of survey and case study in physical education
    - . Types of survey
    - . Survey techniques- by questionnaire, interviews, case study
    - . Qualitative and quantitative research data
    - . Procedure for developing a questionnaire, a checklist, a schedule, a score card
- UNIT-IV**      **INTRODUCTION TO STATISTICS**
- 4.1      Meaning need and importance of statistics in physical education
  - 4.2      Types of statistics-descriptive, comparative, relationship, inferential and predictive
  - 4.3      Characteristics of data
    - . Raw scores
    - . Single scores

- . Attribute and variable
- . Types of data
- . Population and sample
- . Parameters and statistics
- . Frequency distribution
- . Discrete and continuous class intervals
- . Measures of central tendency
- . Measures of variability

**UNIT-V      NON-PARAMETRIC STATISTIC**

- 5.1      Uses and application of non-parametric statistic
- 5.2      Computation of chi-square, rank order correlation and tetrachoric correlation

**RESEARCH PROCESS AND STATISTICAL TECHNIQUES IN PHYSICAL EDUCATION**

**UNIT- I      EXPERIMENTAL RESEARCH**

- 1.1      Scientific method and experimental research
- 1.2      Characteristics of experimental method
- 1.3      Experimental control
- 1.4      Experimental design
  - . Single group design
  - . Repeated measure design
  - . Static group comparison
  - . Random groups design
  - . Post-test only random group design
  - . Related groups design
  - . Rotation group design
  - . Factorial design

**UNIT-II      AREAS OF RESEARCH**

- 2.1      Research in exercise and sport physiology
- 2.2      Motor learning and motor control
- 2.3      Psychological studies
- 2.4      Bio-mechanical research
- 2.5      Growth and development research

**UNIT-III      PREPARATION OF RESEARCH REPORT**

- 3.1      Formulation and submitting research proposal
- 3.2      Organization of thesis report
- 3.3      Technical aspects of writing research report
- 3.4      Use of illustrative material
- 3.5      Consideration in writing report and abstract

**UNIT-IV      PROBABILITY CURVE**

- 4.1      Meaning and principles of normal curve
- 4.2      Binomial expansion and properties of normal curve
- 4.3      Comparison of various scales

**UNIT-V      RELATIONSHIP AND COMPARITIVE STATISTICS**

- 5.1      Principles of relationship
- 5.2      Coefficient of correlation
- 5.3      Product moment correlation
- 5.4      t-ratio-independent and paired
- 5.5      ANOVA- one way and two way

**FUNDAMENTALS OF SPORT SOCIOLOGY**

**UNIT-I      INTRODUCTION TO SPORT SOCIOLOGY**

- 1.1 Meaning and concept sociology
- 1.2 Importance of its study
- 1.3 Current status of sport sociology in India and abroad
- 1.4 trends in sport sociology
- 1.5 Theories in sociology
- 1.6 Theories about sports and society(structured and functionalism;
- 1.7 Critical, conflict, gender and interactionism theories)
- 1.8 A comparative analysis of sociological theories in sports

**UNIT-II SOCEITY AND CULTURE**

- 2.1 Definition and concept of society
- 2.2 Sports in human societies (ancient, feudal, capitalistic and socialistic)
- 2.3 Sport as a part of social, structural and functional system
- 2.4 Sociological differences in ancient and modern sports
- 2.5 Meaning and concept of culture-sub-culture (Material and immaterial)
- 2.6 Sport as a cultural phenomenon
- 2.7 Cultural symbols in sport

**UNIT-III STRATIFICATION AND SOCIALIZATION**

- 3.1 Definition of stratification (classes, caste, age, gender in sports)
- 3.2 Stratification and social mobility
- 3.3 Stratification and popularity of sport
- 3.4 Theories of socialization and sport
- 3.5 Facilitation and debilitation of sport specialization in genders.
- 3.6 Desocialization from sport

**UNIT-IV SPORT AND GENDER**

- 4.1 Definition and theories of gender
- 4.2 Gender disparity and discrimination, and equity
- 4.3 Gender involvement in sports and masculinity
- 4.5 Deviance & aggregation in players
- 4.6 Spectator, fans and violence
- 4.7 Influence of spectators in dynamic of sports

**UNIT-V COMMUNICATION AND RESEARCH METHODOLOGY**

- 5.1 Mass communication and its implication in sports
- 5.2 Commercialization in sports
- 5.3 Amateurism versus professionalism
- 5.4 Recent social research methodologies (phenomenology, Hermeneutics, semiotics)
- 5.5 Qualitative and quantitative research
- 5.6 Participant observation and interview method in research
- 5.7 Impact of privatization and globalization on sports

**FUNDAMENTALS OF SPORT PSYCHOLOGY**

**UNIT-I 1 INTRODUCTION TO SPORT PSYCHOLOGY**

- 1.1 Meaning and Scope of sport psychology
- 1.2 Divisions of sport psychology
- 1.3 Place of sports psychology in sports sciences hierarchy
- 1.4 Importance of sport psychology

**2 SENSORY PERCEPTUAL PROCESS**

- 2.1 Meaning, mechanism and stages of sensory perceptual process
- 2.2 Classification of senses and sensory perceptual process
- 2.3 Factors in perception
- 2.4 Implication of sensory-perceptual process in exercise and sport

**UNIT-II 1 MOTOR DEVELOPMENT AND LEARNING**

- 1.1 Understanding motor development and motor learning
  - 1.2 Motor development and learning in infants and children
  - 1.3 Factors affecting motor developing and motor learning
  - 2** **PSYCHOLOGICAL SKILLS AND THEIR INFLUENCE ON SPORTS PERFORMANCE**
    - 2.1 Attention
    - 2.2 Concentration
    - 2.3 Confidence
    - 2.4 Imagery
- UNIT- III**
- 1** **PERSONALITY**
    - 1.1 Concept and definition of personality
    - 1.2 Modern perspective, trait humanistic, social cognitive and biological theories)
    - 1.3 Dynamics of personality in activity and sport
  - 2** **ANXIETY IN SPORT**
    - 2.1 Concept, definition of anxiety
    - 2.2 Anxiety and Arousal
    - 2.3 Effect of anxiety on physical performance
- UNIT- IV**
- 1** **MOTIVATION IN ACTIVITY AND SPORT**
    - 1.1 Concept, definition and types of motivation
    - 1.2 Theories of motivation (drive, need and instinct theories)
    - 1.3 Motivation in activity and sports
  - 2** **PSYCHOLOGICAL PREPRATION AND COMPLETION**
    - 2.1 Phenomenon of competition sport
    - 2.2 Psychological preparation for competition
- UNIT-V**
- SOCIO-PSYCHOLOGICAL ASPECTS OF ACTIVITY AND SPORT**
    - 1.** **SOCIO-CULTURE FACTORS AFFECTING PERFORMANCE**
      - 1.1 Social ethics and sport
      - 1.2 Attitude towards activity and sport
      - 1.3 Team (group) cohesion
    - 2.** **SPECTATORS AND PERFORMANCE**
      - 2.1 Types of spectators-crowd, fans
      - 2.2 Facilitation and debilitative effects of spectators on performance

## **FUNDAMENTALS OF SPORT BIO-MECHANICS**

### **UNIT-I**

#### **THE STUDY AND ANALYSIS OF HUMAN MOVEMENT**

Kinesiology and Bio-Mechanics:

Areas of study

Approaches for studying movement,

Importance of biomechanics in Physical Education and Sports

Research in and out of the Laboratory

#### **INTRODUCTION TO BIOMECHANICS INSTRUMENTATION**

Overview of instrumentation and its uses

Clocks and times

Stroboscopy

Cinematography and computer assisted analysis

Videography and computer assisted analysis

Force measuring instrumentation Accelerometry

Electorogoniometry

Electromyography

Using micro computers for collecting and analyzing data

## UNIT-II

### **LOOKING AT MOVEMENT: SOME MECHANICAL CONCEPTS**

Types of motion  
Distance and Displacement  
Speed, Velocity and uniform acceleration  
Acceleration and uniform acceleration  
Force and momentum  
Pressure  
Mass and weight  
Gravity  
Center of gravity  
Work  
Power Energy

### **Forces and Movement**

Forces acting on a system  
Reaction forces  
Friction force  
Centripetal and centripetal forces  
Elastic force  
Internal and external forces  
Motive and Resistive forces  
Force diagrams and Vectors

### **Torque and moment of inertia**

The effect of two or more torques on a system  
Vector Composition of torque  
Torque and body's center of gravity location

### **Other Kinetics**

Lever, types of levers and their mechanical advantage and disadvantage with special reference to physical education and sports application.  
Friction, types of friction and their mechanical advantage and disadvantage with special reference to physical education and sports application.

## UNIT-III

### **BODY BALANCE AND STABILITY CONTROL**

Balance  
Equilibrium and stability  
Controlling balance in static positions  
Controlling balance during movement

### **NEWTONS LAWS OF MOTION**

Law of inertia (Linear Motion)  
Law of moment of Inertia (Angular Motion)  
Law of Momentum (Linear Motion)  
Law of Angular Momentum (Angular Motion)  
Law of Action and Reaction (Linear Motion)  
Law of Action and Reaction (Angular Motion)

## UNIT-IV

### **OBSERVING AND ANALYZING PERFORMANCE**

The Nature of skills  
Overall performance objective of

skill The analysis process

### **Projectile-Related Activities**

Properties of motion related to projecting for vertical distance

Projecting for vertical distance with a horizontal component

Projecting for horizontal distance

Projecting for accuracy

Principles derived from Projectile Motion

### **FLUID FORCES**

Fluid drag

force Fluid lift

force

### **Application of Arrangement in Sport**

Effective of drag on the body and objects in sport

Effects of lift in sport

Lift force produced by spin: The Magnus effect

### **Application of Hydrodynamics in Swimming**

Buoyancy & floatation

Resistive forces in swimming skills

Propulsive forces in swimming

skills Swimming speed & efficiency

## **UNIT-V**

### **STRUCTURE OF MOTOR ACTION**

Structure of cyclic & aperiodic motor action and movement combination

Functional relationship of different phases of motor action

Qualities of Motor Movements Movement rhythm

Movement coupling

Movement flow

Movement precision

Movement amplitude

Biomechanical principles:

Principles of initial force

Principles of optimum path of acceleration

Principles of conservation of momentum

Principles of Action and Reaction

## **FUNDAMENTALS OF EXERCISE PHYSIOLOGY**

### **UNIT-I**

#### **PHYSIOLOGICAL OF MUSCLE ACTION**

##### **1.1 Neuromuscular Concepts of Muscle Action**

- . Structure and function of Skeletal muscle
- . Contractile mechanism
- . Neural transmission and Motor response
- . Muscular adaptation to training

##### **1.2 Metabolic and Hormonal Control:**

- . Energy systems during rest and exercise
- . Measuring energy expenditure
- . Nature of hormone action
- . Metabolic adaptation to training

### **UNIT-II**

#### **EXERCISE AND TRAINING FOR FITNESS AND PERFORMANCE**

- 2.1 Physical Activity and Health and Fitness**
  - . Role of physical activity in disease prevention
  - . Behaviour supporting fitness and health
  - . Elements of total fitness(Wellness)
- 2.2 Training for Sport and Fitness:**
  - . Principles of Training
  - . Overtraining, under training optimum training
  - . Benefits of resistance training
  - . Adaptation t aerobic and anaerobic training

**UNIT-III NUTRITION, BODY COMPOSITION FOR FITNESS AND PERFORMANCE**

- 3.1 Nutritional Aspect of Fitness And Performance :**
  - . Balance diet
  - . Water and electrolyte balance
  - . Athlete's diet
  - . Physiological basis of diet for sedentary, physically active and sports Person.
- 3.2 Optimal Body Composition For Fitness And Performance:**
  - . Concepts of body composition
  - . Assessment of body composition
  - . Body composition for optimal health and fitness
  - . Body composition and sports performance

**UNIT-IV HEALTH DISORDERS AND PHYSICAL ACTIVITY**

- 4.1 Cardiovascular Disease And Physical Activity:**
  - . Concepts of cardiovascular disease
  - . Cardiovascular disease risk factors
  - . Reducing risks through physical activity
- 4.2 Obesity, Diabetes and Physical Activity**
  - . Obesity and its causes
  - . Etiology of diabetes
  - . Role of exercise in prevention and treatment of obesity and diabetes.

**UNIT-V FUNDAMENTALS OF EXERCISE PRESCRIPTION AND PHYSIOLOGICAL TESTING OF SPORTMEN**

- 5.1 Prerequisites of Exercise Prescription:**
  - . Medical clearance
  - . Consent form
  - . Readiness to exercise (PAR-Q)
  - . Stop test indicators, pre exercise session preparations
  - . Monitoring exercise intensity
- 5.2 Sport Specific Physiological Testing Perquisites:**

- . Pretest preparation checklist
- . Medical examination
- . Consent form
- . Quality assurance
- . Protocols for physiological assessment of players

## **FUNDAMENTALS OF SPORT MANAGEMENT AND ADMINISTRATION**

### **UNIT-I      MANAGEMENT AND ADMINISTRATION**

- 1.1 Definition, meaning and concept of sports management and administration
- 1.2 Nature, scope and principles
- 1.3 Function of sports management
- 1.4 Profile of a successful administration/manager

### **UNIT-II      FACILITIES AND FINANCE MANAGEMENT**

- 2.1 Planning and development of facilities
- 2.2 Developing multipurpose sports facilities
- 2.3 Management of safety measures
- 2.4 Fundraising, accounting and budgeting

### **UNIT-III     LEADERSHIP**

- 3.1 Leadership types and traits of a successful leader
- 3.2 Time Management
- 3.3 Managing meetings
- 3.4 Personnel management and voluntary management

### **UNIT-IV     SPECIAL SERVICES**

- 4.1 Types of sports events
- 4.2 Formation of committees
- 4.3 Draw of fixtures, schedules and ceremonies
- 4.4 Reporting and evaluation

### **UNIT-V      OFFICE MANAGEMENT**

- 5.1 Meaning and definition of office management
- 5.2 Elements and functions of office management
- 5.3 Layout of physical education department
- 5.4 Office correspondence

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