

**M.Phil.**  
**OPTIONAL PAPER III (B)**  
**SPORTS BIOMECHANICS**

1. Description of Human movement planes, Axes
2. Classification of force system.  
 Linear force system parallel force system concurrent force system  
 General force system Composition and resolution of force.
3. Methods of Investigation  
 Photo instrumentation-Camera, Films Exposure Meters, Calibration  
 Camera speed Filming Fundamentals, Films analysis, Fundamentals  
 of film analysis.
4. Other methods of investigation-Goniometry Accelerometers  
 Dynamometry Electro myography.
5. Location of Center of Gravity Mannikin methods, Segmentation  
 methods, Reaction board method.
6. Method's of analysis of sport skills.  
 Qualitative Method.  
 Quantitative Method  
 Basic steps Development of Model, observation of performance  
 identification of fault Evaluation of faults, Instruction to  
 performer,  
 Qualitative analysis model of Running Diving Serving in Tennis
7. Analysis of Basket ball Techniques- Passing-Chest pass, Overhead  
 pass, Bonner Baseball pass  
 Velocity at Release, Height at Release, Air Resistance  
 Dribbling Shooting-Distance Angle of Entry, Body Dosition and  
 Footwork. Jumping Lay up shot stopping.
8. Analysis of Volleyball Techniques- The serve, The pass, over head and  
 under hand. The spike.]
9. Analysis of Tennis techniques- Grip, Striking, Serve, Spin Direction of  
 flight of Ball.
10. Practical Section : (Practical Analysis of Ten selected skills of selected  
 game. (Max marks 20)

**REFERENCE BOOKS**

1. Bunn John W. Scientific Principles of Coaching  
 (Englewood, Cliffs, N.J. Prntice Hall Inc. 1972)
2. Dyson Geoffrey H.G. The Mechanics of Athletics.  
 (London. University of London Press Ltd. 1968)
3. Hay, Jarnes G. The Bromechanics of Sport Techniques.  
 (Englewood, Cliffs, N.J. Prentice Hall, 1985)
4. Hay, James G. and Reid J.G. The Anatomical and Mechanical Bases of  
 Human Motion (Englewood, Cliffs, N.J. Prentice Hall 1982)
5. Hay James G. and Reid J.C. Avin Anatomy, Mechanics and Human  
 motion (Englewood Cliffs, N.J. Prentice Hall Inc. 1988)
6. Hochmuth, Gerhard, Biomechanics of Athletic movement  
 (Berlin Sportveiaig, 1984)

7. Mill, Doris L. and Nelson Richard C. Biomechanics of Sport  
A Research Approach (Philadelphia. Lea and Febiger 1976)
8. Simonian Charles, Fundamentals of Sports Biomechanics  
(Philadelphia Lea and Febiger (1976)
9. Williams and Lissner, Biomechanics of Human Motion.  
(London : W.B. Saunders Company, 1977)