

Birla Institute of Technology & Science, Pilani
Introduction to Sports Engineering, ME F340,
Comprehensive Examination Sem-II 2022-23
CLOSED BOOK

Weightage: 40

Duration: 120 min.

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- *Answer all parts of a question in same sequence*
 - *Answer to the point and brief*
 - *For sketches, use pencil, scale etc. drawing aids*
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Q 1) State any three limitations of traditional performance analysis methods. List any four types of analysis used in today's sports field. [3+4=7]

Q 2) Enlist the general principle of ergonomics related to bio-mechanical, physiological and anthropometric background. [3*3=9]

Q 3) Describe the mechanical principles applied in walking. [8]

Q 4) What do you understand by multiplier impact on economy - explain with reference to business opportunities created by Sports related activities. [6]

Q 5) Point out the ergonomic consideration for the design of a Hockey Stick. How the Anthropometry can improve the performance of sports person in the game of Hockey? [5+5=10]

Q 6) What are the energy systems employed by the body that produces energy for the athletes? Explain with by-product formation. [4+4=8]

Q 7) Answer the followings in short and with example / sketch where ever necessary [8*4=32]

- (a) What is the difference between point elastic and area elastic flooring system?
- (b) What is percentage force reduction with respect to surface test related to impact?
- (c) Explain the differences between grass, clay and asphalt court from structure and maintenance point of view.
- (d) What is specialty of Prehension grip? Name a sports where we use prehension grip.
- (e) You are given to do qualitative analysis of gait of several athletes, name 3 tools you will use for analysis. Name two advantage of qualitative analysis vs quantitative analysis.
- (f) Name one important role for each, played by 'Gluteus Maximus' and 'Neck of Femur' in hip joint motion
- (g) Explain what you mean by Medial and Lateral rotation
- (h) Differentiate between eccentric, Isometric and Concentric muscle action

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