

Semester-IV

Paper-10: PHYSIOLOGY OF EXERCISE

Max. Marks = 150

(42 Hours)

UNIT-IDefinition, concept, need and scope of exercise physiology. **(Book-1, Ch-1, Page-1-13)**Skeletal Muscles: Gross and microscopic structure, chemical composition, sliding filament theory of muscular contraction, muscle fibre types, and effect of exercise and training on the muscular system. Exercise physiology; energy, nutrition, and human performance, **(Book-1, Ch-3, Page-38-87)** **8 Hours****UNIT-II**Energy for cellular activity; energy source (carbohydrate, fat, protein), ATP production-ATP-PC system, Glycolytic system, Oxydative system. **(Book-1, Ch-2, Page No. 14-37).**Hormonal regulation of exercise; the endocrine gland and their hormones, the endocrine response to exercise. **(Book-3, chapter-6).****8 Hours****UNIT-III**Cardiovascular system; cardiovascular response to exercise and adaptation to training- heart size, stroke volume, heart rate, cardiac output, blood supply, blood pressure, and blood volume. **(Book-3, Chapter- 8 &10).**Respiratory system; pulmonary ventilation during exercise, respiratory adaptation to training- lung volume, respiratory rate, pulmonary ventilation, pulmonary diffusion, arterial-venous O₂ difference. **(Book-1, Chapter- 6).****8 Hours****UNIT-IV**Thermal regulation and exercise; mechanism of body temperature regulation, physiological response to exercise in the heat, heat related disorder, physiological response to exercise in the cold, health risk during exercise in cold. **(Book-4).**

Exercise at altitude; conditions at altitude, physiological response to altitude, clinical problems of acute exposure to altitude.

(Book-2, Chapter- 14, Page-263-280).**9 Hours****UNIT-V**Physiological concepts of physical fitness: concept of physical fitness **(Book-5, chapter-1)**. Factors determining the development of strength, speed, endurance, flexibility- **(Book-3, chapter- 6, 7, 8 & 9).**The exercise prescription: mode of exercise, frequency of participation, duration of each exercise bout, intensity of the exercise bout. **(Book-3, Chapter-1).****9 Hours****Note:** Question Paper will be divided into two parts A and B. The Examiner is required to set 5 questions for Part-A and 5 questions for Part-B taking one question for each part from each of the five units of the syllabus. The questions of Part-A shall carry 5 marks each and questions for Part-B shall carry 20 marks each.

The student is required to attempt any 3 questions from Part-A and any 3 questions from Part-B.

PRACTICALS (28 Hours)

Assessment of resting heart rate of a given subject.

Measurement of blood pressure during rest.

Measuring vital capacity.

Measuring cardio respiratory fitness through 1-mile Rockport test.

Measurement of heart rate during exercise and recovery.

Estimation of target heart rate.

Harvard step test and its modifications.

ESSENTIAL READING:**Book-1:** Tiwari Sandhya, 2009, Exercise physiology, Sports publication.**Book-2:** Jack H Wilmore and David L Costil 1994, Physiology of sports and exercise, human kinetics**Book-3:** Hardayal Singh 1991, Science of sports training, D.V.S. publication

Book-4: Fox E. et.al (1989). The Physiological Basis for exercise and sports. Brown & Benchmark Publishers. USA.

Book-5 : Werner W.K. Hoeger and Sharon A Hoeger, 2004, principles and labs for fitness and wellness, seventh edition, Thomson wadsworth)

SUGGESTED READINGS

- Hoeger, Werner W.K, Hoegen, Sharon A. Principles and Labs for fitness and wellness. 7th ed, Thomson Warsworth, 2004.
- Kang, Jie. Bioenergetics Primer for Exercise Science, Human kinetics, 2008.
- Powers, S. and Howley, E. (2006). Exercise Physiology. McGraw Hill, USA.
- Richardson, Seano, Anderson, Mark B: Overtraining Athletes: Personal Journey in Sports, Human Kinetics 2008.
- Wilmore, Jack H and Costill, David L. Kenny W. (2008) Physiology of Sports and Exercise, 4th ed. Human kinetics.
- Brooks, G., Fahey, T. and Baldwin, K. (2004). Exercise Physiology. McGraw Hill, USA.
- Gerard J Tortora SR Grabowski. Principles of Anatomy and Physiology.
- Merieb EN (2007). Essential of Human Anatomy & Physiology. Ed 8th Dorling Kindersley. India.
- Rowland Thomas W. children's (2005). Exercise Physiology. 2nd Edition Human Kinetics.

Theory : 100 (75+25 Int. Assessment)

Practical : 50