TRIPURA UNIVERSITY

(A Central University)

Suryamaninagar

SYLLABUS

OF

Human Physiology

(Hons.)

Semester- IV

UNDERGRADUATE

HUMAN PHYSIOLOGY (HONOURS)

Semester 04 **Paper 04** **Total Marks — 100**

THEORY (H4A)

Total Marks — 60

Unit IX: Respiratory System and Aviation Physiology (30)

1. Anatomy and histology of respiratory tract and organs: Muscles of respiration.
2. Mechanisms of breathing: Mechanism of breathing, respiratory pressure, lung compliance, surfactant, airway resistance.
3. Pulmonary function test: lung volume and capacities, Spirometry: measurement of Vital capacity, FVC, Timed Vital capacity, FEV1, MVV or MBC, PEFR with their significance.
4. Course, peculiarities and control of pulmonary circulation.
5. Transport of O_2 and CO_2, O_2 dissociation curve- factors affecting and significance.
6. Regulation of Respiration – neural and chemical
7. Hypoxia-types, causes and effects
8. Basic concepts on Asphyxia, Apnoea, Hyperapnoea, Cyanonsis, Periodic breathing, Dyspnoea, Chronic obstructive pulmonary disease – asthma, restrictive pulmonary disease – emphysema.
9. High Altitude Physiology: Baromatric and partial pressure of O_2 at high altitude, changes in the body at high altitude, motion sickness, acclimatization of high altitude.
10. Aviation Physiology- Acceleration and gravitational force, effects of positive and negative G force on body, space physiology, effects of weight lessness on cardiovascular system. Musculo-skeletal system, blood, immune system, Space motion sickness.

Unit X: Ergonomics and Sports Physiology (30)

1. Scope and apllication of ergonomics and work Physiology, Static and Dynamic work, Classification of work and exercise.
2. Energy cost of different Physical activities-its determination, Ergometry-working principle of ergometers – bicycle and treadmill.
3. Importance of measurement of different physiological parameters like heart rate (pulse rate), O_2-consumption, blood pressure.

4. Anthropometry in ergonomics, commomn antropometric measurements used in work place design.
5. Muscles in exercise strength, power and endurance of muscles, muscles metabolic sysytem in exercise (energy source during muscular exercise) Nutrients used during exercise.
6. Physiological chasnges during exercise- cardiovascular (circulatory) and respiratory changes, steadst state, second wind, Fatigue-causes.
7. Metabolic changes during exercise-anaerobic power capacity, maximum aerobic power VO_2max – its determination and significance, Recovery of metabolic systems after exercise, O_2 debt.- lactacids and alactacids.
8. Exercise training: Principles of training, aerobic and anaerobic training, Effects of training on muscles, cardiovascular (circulatory) and respiratory system.
9. Nutrition/Diet in athletics performance- pregame meal, Glycogen/carbohydrate loading.
10. Doping in sportsd; ethical issues, harmful effects of caffaine, steroids, amphemmine and cocaine abuse on health.

Add on topics:

1. Toxicology- general concept
2. Importance of Physical exercise.
3. Role of Physical exercise on lung function.
4. Binocular and stereoscopic perception
5. Abnormalities of taste
6. Abnormalities of smell sensation
7. Neuroscience method- neuroimaging, non- invasive electrophysiology, classical electrophysiology-basic idea.

Suggested Readings:

i. Text Book of Physiology – A. K. Jain .
ii. Guyton and Hall text book of Medical Physiology - John E. Hall; Michael E Hall.
iii. Concise text book of physiology – Indu Khurana; Arushi Khurana.
iv. A text book of sports and exercise physiology – Swapan Kumar Dey.

PRACTICAL (H4B)

Total Marks — 40

Group –A

1. Spirometric determination of VC, FVC, FEV1, FRV1, MVV
2. Determination of heart rate, P-R interval, Q-T, QRS duration and S-T segment from electrocardiogram.
3. Determination of electrical axis of heart from stenoid
4. Effect of posture and exercise on blood pressure.
5. Determination of VO2 max by Queens college step tests.

Group –B

1. Prediction of BMR using prediction equation of ICMR and determination of BMR of a person from the graphical record of Benedict Roth apparatus from the applied graphical record.
2. Estimation of body fat by using skin fold method.
3. Determination of respiratory rate by pneumograph: Effects of Hyperventilation, Breath holding and exercise on respiratory pattern.

Group –C

1. Determination of PFI by Harvard step test and graphical representation of recovery pulse rate.
2. Determination of muscle strength and endurance by hand grip Dynamometer.
3. Determination of muscular effeciency by ergography.

Distribution of marks:

Total Marks: 40
Internal assessment: 08
Term and exam: 32

Group A (any-one experiment):	08
Group B (any-one experiment):	08
Group C (any-one experiment):	08
Practical Note Book	04
Viva Voce	04