2011

M.Sc.

1st Semester Examination

HUMAN PHYSIOLOGY

PAPER—PHY-102

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Unit—03

Answer any *two* questions.

1. (a) Give the equation for the Pressure-flow relationship of Poisseuille in a vascular bed.

(b) Water flows through a 20cm long horizontal tube having the internal radious of 0.081 cm, under a constant head of liquid 20cm high. In 12 min. 864 ml. of liquid emerges from the tube. Calculate the

viscosity of water (Given g = 981 cm sec^{-2}, Pw = 1 gm cm^{-3}).

(c) What is Bernoullis principle? 2+6+2

2. (a) State the haemodynamic principle that governs the flow of blood through rigid blood vessels.

(b) How does the surfactant molecules affect the surface tension?

(c) Discuss the lung-compliance diagram mentioning the hysteresis and state two factors that affect the umg compliance. 3+2+5

3. (a) Describe the mechanism of DNA repair with the help of radiation.

(b) What do you mean by cyclotron radioisotopes?

(c) Write the effect of ultrasonic waves on biological system. 5+2+3

4. (a) Classify different types of jumping.

(b) Discuss the biomechanical aspect of swimming?

(c) What is frictional force? State the laws which are related to the friction in human body. 2+4+4

Unit—04

Answer any *two* questions.

1. (a) Discuss the principle of radiation thermometry with reference to Plank's law.

(b) Give a schematic presentation of the unbound strain gauge pressure transducer.

(c) What do you mean by microelectrode? 6+2+2

2. (a) Write the basic principle of ultrasonic blood flowmeter.

(b) Discuss the principle of operation of doppler ultrasound blood flowmeter.

(c) Give a schematic presentation of the cylindrical coil configuration of NMR blood flowmeter. 2+6+2

3. (a) What do you mean by Piezoelectric effect?

(b) How can you measure the blood PCo_2 with Stow-Severinghaus Densor? Give a schematic diagram of the same.

(c) What is flotting electrode? State its importance in ECG recording. 2+5+3

4. (a) Describe the structure and principle of operation of Geiger-Müller counter during radiation measurement.

   (b) Briefly discuss about M-Scan.

   (c) What is the dead time of Geiger–Müller counter ?

5+3+2

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