

2012**M.Sc.****1st Semester Examination****HUMAN PHYSIOLOGY****PAPER—PHY-102**

Full Marks : 40

Time : 2 Hours

*The figures in the 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 - 3)**

Answer any two questions.

1. (a) Bernoulli's principle gives the following expression : $P_L + KE = \text{constant}$, where P_L is the lateral pressure on the vessel and KE is the Kinetic energy. Explain the principle.

(b) A liquid of density 1.45 gm/cc, flow along a horizontal tube, the cross section of which is not constant. Compute the change in pressure when the velocity of flow changes from 15 cm.sec⁻¹ to 25 cm.sec⁻¹.

- (c) What is the significance of Reynold's number in hemodynamics? $2\frac{1}{2}+5+2\frac{1}{2}$
2. (a) Briefly write the characteristic features of different states of glottis during phonation.
- (b) Describe the anatomical organisation of larynx during phonation with suitable diagram.
- (c) What do you mean by electroglottography (EGG)? $5+4+1$
3. (a) Write the names of the man-made crystals of piezoelectric materials.
- (b) Describe the mechanism of piezoelectric effects.
- (c) Classify ferroelectricity on the basis of polarization. $3+4+3$
4. (a) Describe the importance of radionuclide therapy in cancer treatment.
- (b) Briefly discuss the non-stochastic effects of radiation.
- (c) What are the physiological significance of heart sound. $4+4+2$

(Unit-4)

Answer any two questions

1. (a) Describe the basic components of a microprocessor based multi-channel ECG machine with suitable diagram.
- (b) What is the working principle of DC defibrillator?
- (c) Mention the clinical application of Laser Doppler Flowmeter (LDF). 4+3+3

2. (a) Discuss hemodialysis with its principle.
- (b) Describe the instrumental arrangement of hemodialysis machine with suitable diagram.
- (c) What do you know about "bioengineered kidney"? 3+4+3

3. (a) Describe the general block diagram of an audiometer.
- (b) What is audiogram?
- (c) Briefly discuss the multi-channel telemetry system with suitable diagram. 5+1+4

4. (a) Describe the different types of echocardiogram test.
- (b) Write the mechanism of 3D image formation from sound wave during CT scan.
- (c) What are the composition of liquid (cocktail) used for liquid scintillation counter, during radiation measurement.

3+5+2