

Total Pages – 4

M.Sc. RNLK-/PHY102/22

2022

Human Physiology

[First Semester]

Paper - PHY 102 (U3+U4) (Theory)

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks.

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

Illustrate the answers wherever necessary.

Unit-3

F.M.-20

(Medical Physics and Chemistry)

1. Answer any two questions from the following : $2 \times 2 = 4$

- a) Define viscosity. What is viscosity coefficient? 1+1
- b) What is critical fusion frequency? 2
- c) Differentiate between pseudo-plastics and dilatants. 2
- d) Distinguish between CD and ORD. 1+1

(Turn Over)

(2)

2. Answer any two questions from the following : $4 \times 2 = 8$

- a) Differentiate between Newtonian and non-Newtonian fluids. What is Reynold's number?
- b) Write down the principle and applications of Patch-clamp technique. 4
- c) State Henry's law regarding the partial pressure of gases. Describe the change in partial pressure of oxygen and carbon dioxide in alveoli. 2+2
- d) "The eye is a simple optical instrument"—Justify this statement. 4

3. Answer any one questions from the following : $8 \times 1 = 8$

- a) (i) Differentiate between laminar and turbulent flow.
(ii) Explain using Poiseulle's equation, what will be the flow of a liquid if the inlet pressure equals the outlet pressure?
(iii) What is cerebral infarction? 3+2+3
- b) (i) Briefly explain the various modes of illumination of the retina.
(ii) What is reduced eye?

(3)

- (iii) Explain the applications of fluorescence spectroscopy. 3+2+2

Unit-4

F.M.-20

(Medial instrumentation and techniques)

- 1. Answer any two questions from the following : $2 \times 2 = 4$**
- a) What are radioisotopes? Mention their significance. 1+1
 - b) What are meant by resolution and magnification of a microscope? 1+1
 - c) What is tracer technique? Write down two advantages of tracer experiment.
- 2. Answer any two questions from the following : $4 \times 2 = 8$**
- a) Differentiate between SEM and TEM. 2+2
 - b) Briefly explain the freeze-fracture technique. Mention the function of a defibrillator. 3+1
 - c) What is radioisotope? How they are used in medicine? 2+2

(4)

- d) Mention the types of electrodes used in EMG and ECG. 2+2

3. Answer any one question from the following : 8×1=8

- a) (i) Briefly explain the principle and applications and liquid scintillation counter.
- (ii) Mention the types of audiometers with their applications.
- (iii) Describe radioactive decay. 4+2+(1+1)
- b) (i) Write the principle of MRI and its applications.
- (ii) What is SPECT?
- (iii) How BOLD differs from PET? 4+2+2