

2022

**Human Physiology**

[P.G.]

**(M.Sc. First Semester End Examination-2022)**

**PAPER-102**

**Full Marks:40**

**Time: 02 Hrs**

*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**

**Marks 20**

**[Medical Physics and Chemistry]**

- 1. Answer any two questions of the following: 2x2= 4**
- a) What is visco elasticity? 2
  - b) What is the difference between Newtonian fluids and nonnewtonian fluids? 2
  - c) Write down the Dalton's law of partial pressure in gas mixtures. 2
  - d) State the principle of fluorescence spectroscopy. 2

(2)

2. Answer any two questions of the following:  $2 \times 4 = 8$
- a) Write down the reasons behind the development of membrane potential. 4
  - b) Describe the change of refraction of the light path in different parts of a human eye to visualize the object. 4
  - c) How can you identify the functions of a brain region in an experimental mouse? 4
  - d) What do you know about the critical fusion frequency? 4

3. Answer any one question of the following:  $1 \times 8 = 8$
- a) Discuss the patch clamp technique and state its applications in biological research. 8
  - b) Discuss the origin of a dipole in cerebral cortex that may be recorded as the spontaneous electrical activity of brain. Describe the characteristics of different waves of spontaneous electrical activity of brain. 4+4

Unit – 4

Marks 20

[MEDICAL INSTRUMENTATION]

1. Answer any two questions of the following:  $2 \times 2 = 4$
- a) Write down the working principle of NMR. 2
  - b) Write down the advantages of CT scan. Why silver-silver chloride electrodes are preferred over other electrodes? 2

(3)

- c) What are the electrodes used for EMG? 2
- d) State the disadvantages of using surface electrodes for Emg. 2

2. Answer any two questions of the following:  $2 \times 4 = 8$
- a) What are floating electrodes? Explain in brief about micro electrodes with a suitable diagram. 1+3
  - b) Describe the different fixation and staining techniques used in EM. 4
  - c) Discuss the multi-channel telemetry. Write down the importance of dialyzers. 3+1
  - d) Differentiate between PET and SPECT. 4

3. Answer any one question of the following:  $1 \times 8 = 8$
- a) i) Explain the principle and applications of Phase-contrast Microscope.
  - ii) Explain in brief about different types of speech audiometric tests. (3+1)+4
  - b) i) Briefly explain the principle of G.M. counter
  - ii) Discuss with a suitable diagram Doppler Imaging system for blood flow measurement. 3+5

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