

PHYSIOLOGY**PAPER-I**Time: 3 Hours
Max. Marks: 100

PHY/D/19/36/I

Important Instructions:

- Attempt all questions in order.
- Each question carries 10 marks.
- Read the question carefully and answer to the point neatly and legibly.
- Do not leave any blank pages between two answers.
- Indicate the question number correctly for the answer in the margin space.
- Answer all the parts of a single question together.
- Start the answer to a question on a fresh page or leave adequate space between two answers.
- Draw table/diagrams/flowcharts, wherever appropriate.

Write short notes on:

1. In the context of ventricular myocardial muscle: 5+5
 - a) State different phases of action potential and their ionic mechanism.
 - b) Define refractory period, its mechanism and importance.
2.
 - a) Describe different mechanisms by which cells internalize extracellular material. 6+4
 - b) Add a note on receptor mediated endocytosis.
3.
 - a) Explain the terms transcription and translation in gene expression. 3+7
 - b) Give detailed account of transcription factors in terms of types, function and regulation.
4.
 - a) Outline the distribution of water in different compartment of the body. 4+6
 - b) With help of an example, describe the method of estimation of volume of a body fluid compartment.
5.
 - a) Compare and contrast excitation contraction coupling in skeletal, cardiac and smooth muscle. 6+4
 - b) Explain the importance of latch phenomenon.
6.
 - a) Describe the general properties of G protein coupled receptors. 5+5
 - b) Outline the various secondary messengers associated with G protein coupled receptors.
7.
 - a) Compare and contrast innate immunity and adaptive immunity. 4+6
 - b) Describe the role of complement proteins in innate immunity.
8. Explain the role of various organ systems involved in regulation of: 5+5
 - a) Intravascular volume.
 - b) Osmolality of body fluids.
9. Outline the formation of different types of blood cells from a hematopoietic stem cell. Explain the concept of hematopoietic niche. 7+3
10. Formulate a plan for statistical analysis of quantitative data obtained from three separate groups of subjects (n=50) in a cross-sectional study design. 10
