

PHYSIOLOGY

PAPER-I

Time: 3 hours
Max. Marks:100

PHY/J/20/36/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:

- a) Principles and characteristics of a biological control system. (3+4)+3
 - b) What is the importance of a feed forward control system?
- a) Describe the organization of the body fluids and electrolytes in a healthy young adult male. 4+6
 - b) Discuss in detail how the various body fluids in the body are measured.
- a) Define resting membrane potential. 1+4+5
 - b) Explain the role of sodium potassium pump in the genesis of resting membrane potential.
 - c) Discuss how the Donnan effect influences the distribution of ions in our body.
- a) Define motor unit. 1+5+4
 - b) What is the role of motor unit recruitment in voluntary muscle contraction?
 - c) Explain the principle of Electromyography (EMG) in brief.
- a) Describe in detail the structure of a eukaryotic cell membrane. 7+3
 - b) Explain the significance of micro domains in a cell membrane.
- Describe the application of following in circulatory physiology: 5+5

 - a) Poiseuille-Hagen formula.
 - b) Law of Laplace.
- a) Describe in detail the various theories of aging. 8+2
 - b) Add a note on "Successful aging".
- a) Describe the process of antigen presentation. 5+5
 - b) Compare the different types of immunoglobulins found in human body.
- Describe in detail the various cytoskeletal structures and their functions. 10
- a) Parametric and Nonparametric tests of significance. 5+5
 - b) Sampling techniques.
