

**2018**

**M.Sc.**

**4th Semester Examination**

**HUMAN PHYSIOLOGY**

**PAPER—PHY-402**

**Subject Code—30**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand 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—35 )**

Answer all questions :

1. (a) "Plasma membrane is a dynamic fluid"—explain.  
(b) Give a brief account of the factors controlling membrane fluidity. 2+3

Or

- (a) What is FRAP ? Describe the experiment in support of lateral diffusion of protein.

*(Turn Over)*

What is the advantages of FRAP over other experiments ?

(b) What is myristyl anchor of proteins in plasma membrane ? (1+2)+1+1

2. (a) Why cytoskeletons are referred to have 'Mover-Shaper' function in a cell.

(b) Differentiate 'microfilaments' and 'intermediate filaments'. 3+2

Or

(a) What are microtubules ? Describe its structure.

(b) Write down the role of microtubules in a dividing cell and neuronal cell.

(c) What is colchicine ? (1+1)+(1+1)+1

3. (a) What are G-proteins? Mention the different types G-proteins found in human cell.

(b) Give examples of physiological responses mediated by G-protein signal transduction pathways where (i) cAMP and (ii)  $IP_3$  is second messenger.

(1+1)+(1½+1½)

Or

(a) Describe the action of insulin through insulin receptor as RTK.

- (b) What is RAS ?  
 (c) Differentiate adaptor protein and docking protein.

3+1+1

4. (a) What are pluripotent stem cells ?

Differentiate them from fetal stem cells.

- (b) Write down the major properties of stem cells.

(2+1)+2

Or

- (a) Why epithelial stem cells are called progenitor cells ?

- (b) What are the three primary layers of germ cells ?  
 Mention the human tissues developed from each of them.

- (c) What is meant by epigenetic control ? 1+(1+1)+2

## ( Unit—36 )

Answer all questions :

1. What is phagemid ? Why you can select phage 13 vectors of cloning purpose ?

1+4

Or

- (a) Describe the general structure of BAC cloning vector.  
 (b) Briefly discuss the functions of different gene segments of M13 phage.

2½+2½

2. (a) How can you construct genomic library highly specific for eukaryotic cell ?
- (b) Describe the process for detecting genomic restriction fragment through amplified fragment length polymorphism. 2½+2½

*Or*

Write notes on :

- (a) Ischizomers
- (b) T4-DNA ligase
- (c) RFLP 1+2+2
3. How therapeutic cloning can be applied in human disease treatment. 5

*Or*

- (a) Briefly describe the process of reproductive cloning.
- (b) Discuss the different natural and artificial medium used in cell culture with examples. 2+3
4. Discuss the procedure and application of western blotting technique. 4+1

*Or*

- (a) Describe the steps of Polymerase Chain Reaction.
- (b) What is probe element ? How they get hybridized. 2+(1+2)