

**2017****M.Sc.****4th Semester Examination****HUMAN PHYSIOLOGY****PAPER—PHY-402***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—39 )**

Answer all questions from the following :

1. (a) Explain with an experimental evidence that plasma membrane contains lipid bilayer.
- (b) Mention the factors those influence membrane fluidity.

3+2

*(Turn Over)*

Or

(a) Name the major phospholipids present in human plasma membrane.

(b) Differentiate phosphoglycerides and sphingolipids.

(c) What are integral membrane proteins?

(d) What is  $\beta$ -barrel? 1+(1+1)+1+1

2. (a) What is meant by cytoskeleton? Write down its functions.

(b) What are motor proteins? What is their basic mode of action? (1+2)+(1+1)

Or

Give a brief account of microfilaments including its associated proteins. 5

3. Discuss in brief the signal transduction mechanism mediated by RTK mentioning the activation of different types of downstream proteins. 5

Or

(a) Classify the membrane receptors.

(b) Write down the features G-protein coupled receptor.

(c) Describe a G-protein linked signal transduction pathway where  $\text{Ca}^{2+}$  is activated as intracellular messenger. 1+1+3

4. (a) Differentiate fetal stem cells and adult stem cells.
- (b) What are myosatellite cells? Write down its role in skeletal muscle development as progenitor cells. (1+1)+(1+2)

Or

- (a) Write down in brief the mechanism of differentiation mentioning several factors that control this process.
- (b) Discuss the role of histone modification in epigenetic control of differentiation? 4+1

**( Unit—40 )**

Answer all questions from the following :

1. Define Ti plasmid. Write the different genes of Ti plasmid and mention their functional advantages. 1+2+2

Or

Write brief notes on cosmid vectors and YAC vectors.

$2\frac{1}{2}+2\frac{1}{2}$

2. What is recombinant DNA technology? Describe in brief the various applications of recombinant DNA technology. 1+4

Or

- (a) Define restriction enzymes and its types.  
 (b) What is palindromic sequence?  
 (c) What are the purposes of cloning? 2+1+2
3. (a) What is Therapeutic cloning?  
 (b) Discuss how SCNT technique used in stem cell preparation and mention its applications. 1+3+1

Or

How prof. Ian Wilmut created first cloned animal 'DOLLY'. 5

4. Write the procedure and applications of Northern blotting. 4+1

Or

Describe techniques and importance of Southern blotting. 4+1

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