

2022

M.Sc.

4th Semester Examination

HUMAN PHYSIOLOGY

PAPER—PHY-402

Full Marks : 50

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-402.1 CELL AND INHERITANCE BIOLOGY**

**Group-A**

Answer any *two* questions. 2×2

1. Write down the structural features of steroid molecule binding cellular receptors. 2

2. Mention the properties of stem cells. 2
3. Mention two major mechanisms of epigenetics.
4. Define microfilaments. How is myosin related to microfilaments? 1+1

### Group-B

Answer any *two* questions. 2×4

5. What are common myeloid progenitor cells? State the different cells generated in the myeloid lineage. 1+3
6. What is differentiation? State the role of cell signaling to promote differentiation. 2+2
7. What are motor proteins? Give a brief description of actions of microtubule-based motor proteins in a cell. 1+3
8. Differentiate paracrine and endocrine cell signaling.

### Group-C

Answer any *one* question. 1×8

9. What are cell cycle checkpoints? Write about the importance of G1 checkpoint. Describe the role of cyclin in cell cycle progression. 2+3+3

10. Discuss the functional modality of a signal transduction pathway acting through G-protein coupled receptors. 8

## UNIT-402.2 BIOTECHNOLOGY

### Group-A

Answer any *two* questions. 2×2

1. What are molecular scissors? Give example. 1+1
2. What is YAC? 2
3. What are cloning vectors? 2
4. What are FISH and GISH? 2

### Group-B

Answer any *two* questions. 2×4

5. Give a brief account of different stem cell therapy used in diabetes mellitus. 4
6. Schematically explain the process of Southern blotting with diagram. 4
7. Differentiate between transformation and transfection. Mention two applications of transfection. 2+2

8. What do you know about multiple cloning site of a cloning vector? 4

**Group-C**

Answer any *one* question. 1×8

9. (a) Briefly explain the process of RT-PCR.  
(b) Write briefly on whole plasmid mutagenesis.  
(c) Mention the applications site-directed mutagenesis. 3+2+3
10. (a) What is RFLP?  
(b) What are transgenic animals?  
(c) How dot blot is performed? 4+2+2

[ *Internal Assessment - 10 Marks* ]

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