

REV-01
MBT/01/04

M.Sc. BIOTECHNOLOGY
FIRST SEMESTER (SPECIAL REPEAT)
CELL & DEVELOPMENTAL BIOLOGY
MBT-101
[USE OMR SHEET FOR OBJECTIVE PART]

2023/08

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- Metamorphosis of amphibians is triggered by environmental cues that act on the:
 - Thyroid
 - Pituitary
 - Hypothalamus
 - Embryo
- Embryonic stem cells of mammals are derived from:
 - Gametes
 - Blastocoel
 - Trophoectoderm
 - Inner cell mass
- In developmental biology, what is meant by concept of "growth"?
 - Cell increase in size
 - Cell number increase by division
 - Cell death
 - All of the above
- The initial dorsal-ventral axis in amphibian embryos is determined by"
 - The point of sperm entry
 - Gravity
 - The point of contact with the uterus
 - Genetic differences in the cells
- Which of the following correctly lists the life stage of a frog with a complete metamorphosis?
 - Egg, larva, nymph, adult
 - Egg, larva, pupa, adult
 - Egg, pupa, cocoon, adult
 - Egg, nymph, pupa, adult
- The central fluid filled cavity of the blastula is known as:
 - Blastocoel
 - Archenteron
 - Blastocyst
 - Morula
- The end point of a cell's migration in embryo development is determined by concentration of chemicals called:
 - Regulators
 - Organizers
 - Morphogens
 - Inducers
- Cytoplasmic content of an egg cell is:
 - Paternal effect
 - Maternal effect
 - Morphogen
 - Meiotic division
- In early developmental stage, the sperm entry in egg takes place in"
 - Animal hemisphere
 - Vegetal hemisphere
 - Bipolar region
 - Grey crescent

10. Which of the following statements is true for the pollen tube?
 a. It shows only tip growth
 b. It is composed of three non-cellular zones
 c. It shows chemostatic movements
 d. It shows radial cytoplasmic streaming
11. Fluid mosaic model of plasma membrane was coined by:
 a. Meselson and Stahl
 b. Danielli and Davson
 c. David Robertson
 d. Singer and Nicolson
12. Cell theory was postulated by:
 a. Schleiden
 b. Flemming
 c. Virchow
 d. Schwann
13. Proteins arein the cell membrane.
 a. Non transporters
 b. Enzymes
 c. Transporters
 d. None of the above
14. Cell cycle hasimportant check points.
 a. 1
 b. 2
 c. 3
 d. 4
15.ions are responsible for release of acetylcholine in signal transduction.
 a. Calcium
 b. Sodium
 c. Potassium
 d. Chlorine
16. ATPase are embedded inon mitochondria.
 a. Inner membrane
 b. Matrix
 c. Outer membrane
 d. Space between membranes
17. The example of cytoskeleton is:
 a. Actin
 b. Chromosome
 c. Protein
 d. All are correct
18.are responsible of movement mechanism of muscles.
 a. Motors
 b. Myosin
 c. Actins
 d. Cytoskeleton
19. The first check point is:
 a. G1/S
 b. G2/M
 c. G1
 d. G2
20. The fundamental unit of life is:
 a. Cell
 b. Air
 c. Water
 d. Tissue

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

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|---|---------|
| 1. a) Write a note on cell cycle. | 7+3=10 |
| b) Write the importance of check points of cell cycle. | |
| 2. a) Explain the structure of plasma membrane. | 6+4=10 |
| b) Write the basic functions of plasma membrane. | |
| 3. a) How specification differs from Determination? Explain with suitable example. | 4+6 =10 |
| b) What do you mean by morphogenetic gradient? Elaborate with a diagram. | |
| 4. Explain a typical structure of bacteria with suitable diagram. | 10 |
| 5. a) What do you mean by root and shoot apical meristem? | 2+8=10 |
| b) What are the theories behind shoot apical meristems? Discuss elaborately with suitable diagram. | |
| 6. a) Illustrate briefly the metamorphosis in context with amphibians. | 6+4=10 |
| b) Discuss briefly the germ layer differentiation and formation. | |
| 7. a) What do you mean by cellular potency? | 2+8=10 |
| b) Explain the process of pollen tube germination and embryo development in plant with suitable figure. | |
| 8. a) Write a note on significance of cell biology. | 6+4=10 |
| b) Illustrate postulates of cell theory. | |

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