

**B.Sc. BIOTECHNOLOGY**  
**Third Semester**  
**Developmental Biology**  
**(BBT- 13)**

**Duration: 3Hrs.**

**Full Marks: 70**

**Part-A (Objective) =20**  
**Part-B (Descriptive)=50**

**(PART-B: Descriptive)**

**Duration: 2 hrs. 40 mins.**

**Marks: 50**

**1. Write short notes on *any five* of the following:**

**2×5=10**

- a) Radicle
- b) Cambium Tissue
- c) Megaspore
- d) Laminin
- e) Pattern formation
- f) Holoblastic cleavage
- g) Testes

**2. Explain in short *any five* of the following:**

**3×5=15**

- a) What is previtellogenesis? What are the main events that occur during this period?
- b) Classify eggs on the basis of distribution of yolk.
- c) What is tubulation? What are the processes it includes?
- d) Differentiate between epiboly and emboly morphogenetic movements.
- e) What are cadherins? What are its different types?
- f) What is meristematic tissue? What are its functions?
- g) What are the differences between sporogenesis and gametogenesis?

**3. Explain briefly any five of the following:**

- a) What is oogenesis? Describe the process of vitellogenesis? 1+4=5
- b) What is fertilization? Describe the mechanism of fertilization with special reference to cortical events. 1+4=5
- c) Define megasporogenesis. Explain with diagram the different stages of developing embryo-sac from megaspore mother cell. 1+4=5
- d) Write in brief the various cellular factors responsible for morphogenetic movement. 5
- e) What do you mean by maternal inheritance? Oocyte is a polarized cell. Justify the statement. 2+3=5
- f) Define apomixis. What are the different types of its reproduction mode? Explain. 2+3=5
- g) What are the different theories that have been proposed to explain mechanism of activation of egg upon sperm entry? 5

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*(The figures in the margin indicate full marks for the questions)*

**Duration: 20 minutes**

**Marks – 20**

**PART A- Objective Type**

**I. Choose the correct answer from the following option:**

**1×10=10**

1. In apomictic species, when sexual reproduction is absent, it is referred to as

- a) Facultative                      b) Obligate                      c) Apomixis                      d) None

2. In seed germination, first develops-

- a) Micropyle                      b) Shoot                      c) Root                      d) Leaves

3. In sexual reproduction some parental characters do not separate in the offsprings due to

- a) Crossing over                      b) Linkage                      c) Dominance                      d) None

4. Pollen grains are developed in the anthers from

- a) Megaspores                      b) Micro-gametes                      c) Microspores                      d) Cotyledon

5. The process of releasing the ripe ovum from ovary is called

- a) Ovulation                      b) Parturition                      c) Implantation                      d) Fertilization

6. Cells of Leydig are found in

- a) Liver                      b) Testes                      c) Ovaries                      d) Lungs

7. Number of egg, a single primary oocyte ultimately produces in oogenesis is

- a) One                      b) Two                      c) Four                      d) Numerous

8. Antifertilizin is produced by

- a) Egg                      b) Sperm                      c) Both egg and sperm                      d) None of these

9. The mesoderm gives rise to all structures except

- a) Nervous system                      b) Muscular system                      c) Circulatory system                      d) Gonads

10. Hyaluronidase is secreted by

- a) Sperm nucleus                      b) Acrosome                      c) Egg membrane                      d) Corona radiata

**II. Fill in the blanks:**

**1×10=10**

- a) Thickness of a growing tree increases due to ..... activity.
- b) The types of fruits developed without fertilization is called .....
- c) Leaves are developed as a result of the activities of .....  
located in the buds.
- d) The endosperm, which is food storage tissue of seeds, are usually triploid (3x) as a result of  
.....
- e) Testes remains attached to the scrotal sac by a ligamentous connective cord called  
.....
- f) ..... is needed for the proper attachment of axons to target muscle cells.
- g) ..... are specialized intercellular regions where adjacent cells are 15-  
40 nm apart
- h) Each integrin protein has ..... subunits.
- i) ..... is prevented by fertilization membrane.
- j) The acrosome of sperm is formed by .....

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