REV-01
BBT/41/46

2022/07

B.Sc. BIOTECHNOLOGY
SECOND SEMESTER
DEVELOPMENTAL BIOLOGY
BBT – 204

(Use Separate Answer Scripts for Objective & Descriptive)

Duration: 3 hrs. **Full Marks: 70**

(PART-A: Objective)

Time: 20 min. **Marks: 20**

Choose the correct answer from the following: ***1X20=20***

1. During development, if a cell has committed to multiple fate, it is said to be
   a. pluripotent
   b. totipotent
   c. determined
   d. differentiated

2. Middle piece of mammalian sperm possesses
   a. Mitochondria and centriole
   b. Mitochondria only
   c. Centriole only
   d. Nucleus and mitochondria

3. The inner cell mass are
   a. Trophoblast
   b. Germ layers
   c. Formative cells
   d. Follicle cells

4. Morphogenesis is concerned with
   a. Shape of tissue organ and entire organism
   b. Cell growth
   c. Cell differentiation
   d. All of the above

5. Which of the following cells would be considered differentiated
   a. Stem cell
   b. Blastomere
   c. Spemann organizer
   d. Muscle cell

6. In early developmental stage, the sperm entry in egg takes place in
   a. Animal hemisphere
   b. Vegetal hemisphere
   c. Bipolar region
   d. Grey crescent

7. After fertilization, the seed coat develop from
   a. Chalaza
   b. Ovule
   c. Embryosac
   d. Integuments

8. In embryogenesis, which germ layer gives rise to the reproductive system?
   a. Ectoderm
   b. Mesoderm
   c. Endoderm
   d. Blastoderm

9. Male homone involves
   a. Follicle stimulating hormone
   b. Luteinizing hormone
   c. Testosterone
   d. All of the above

10. Double fertilization is characteristics of
    a. Gymnosperms
    b. Angiosperms
    c. Monocots
    d. Bryophytes

11. Conversion of spermatids into sperms is
    a. Spermiogenesis
    b. Spermatogenesis
    c. Gametogenesis
    d. Metamorphosis

12. Immediate after ovulation, the mammalian egg is covered by a layer which get disrupted later by sperm is
    a. Chorion
    b. Zona pelucida
    c. Corona radiata
    d. Vitelline membrane

13. In flowering plants, the free nuclear divisions takes place during
    a. Gamete formation
    b. Flower formation
    c. Endosperm formation
    d. Embryo formation

14. In flowering plants meiosis occurs at the time of
    a. Germination of seed
    b. Formation of buds
    c. Formation of root primordial
    d. Formation of pollen grains

15. The fluid cavity in the blastulation stage is known as
    a. Amniotic cavity
    b. epiblast
    c. blastula
    d. hypoblast

16. Cleavage starts after fertilization in
    a. Fallopian tube
    b. Uterus
    c. Vestibule
    d. Clitoris

17. Archenteron is known as
    a. Primitive gut
    b. Blastocoel
    c. coelom
    d. Alimentary canal

18. In oogamy, fertilization involves
    a. A small non-motile female gamete and a large motile male gamete
    b. a large non-motile female gamete and a small motile male gamete
    c. a large non-motile female gamete and a small non-motile male gamete
    d. A large motile female gamete and a small non-motile male gamete

19. Cellular polarity primarily arises through
    a. Morphogenetic gradient
    b. Transcription factors
    c. Signaling cascade
    d. Localization of specific protein

20. The process in which a cell changes from one cell type to another is
    a. Cell lineage
    b. Cellular apoptosis
    c. Cellular differentiation
    d. Cell division

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PART-B : Descriptive

Time : 2 hrs. 40 min. **Marks : 50**

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

1. Elaborate briefly with suitable diagrams the development of male gametophyte with pollen tube formation **10**

2. a. Who is known as father of experimental embryology? **2+8=10**

   b. Explain their contribution in terms of early experimental embryology.

3. Discuss various types of sperm and elaborate the structure of a matured mammalian sperm with a suitable diagram. **10**

4. a. What do you mean by Polyspermy? **2+8=10**

   b. Explain different methods to prevent Polyspermy.

5. a. Explain the formation of mesodermal layer. **3+7=10**

   b. Explain briefly Spermatogenesis and Oogenesis.

6. a. Explain briefly the term morphogenesis in relevant to bicoid protein. **6+4=10**

   b. Briefly discuss the terminology
      a. oligopotency
      b. blastula
      c. syntial specification
      d. determination.

7. a. Elaborate briefly with suitable diagrams the development of female gametophyte in flowing plants. **-5+5=10**

   b. Discuss the pattern of embryo formation in flowering plants.

8. Briefly discuss the terminology **2×5 =10**
      a. callus
      b. totipotency
      c. Nanos
      d. Cellular potency
      e. Primitive gut

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