REV-00
BBT/52/57

2018/06

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. The biogenetic law is no longer acceptable because it holds among other things that
   a. Recapitulation of phylogeny in ontogeny is never complete
   b. Embryos resemble the ancestral adults of evolutionary stages
   c. Resemblances, if any, are between embryos and not between embryos and adults of evolutionary stages
   d. Pharyngeal pouches and aortic arches are notable examples of recapitulation in the vertebrate series

2. During cleavage, the cell division is very rapid. The daughter cells don't undergo any growth and the cells thus become gradually smaller in volume. Hence:
   a. There is no growth in the volume of the embryo
   b. The embryo grows in volume
   c. The embryo becomes smaller in volume
   d. The embryo remain static

3. In angiosperms the functional megaspore in the linear tetrad is generally
   a. Mycropylar b. Second from mycropylar
   c. Third from mycropylar d. Fourth from mycropylar

4. Female gametophyte of angiosperms is represented by
   a. Ovule b. Megaspore mother cell
   c. embryosac d. Nucellus

5. Double fertilization is unique in angiosperms. It was discovered by
   a. Nawaschin in *Lilium* and *Fritillaria*
   b. Nawaschin in *polygonum*
   c. Strasbuger in *pisum*
   d. Hertwig in *Capsella*

6. After fertilization
   a. Zygote divides first to form embryo
   b. Primary endosperm divides first to form embryo
   c. Both undergo a long period of rest
   d. Both divide simultaneously

7. The male gamete is X and egg is 3X. The ploidy level in embryo and endosperm will be
   a. 4X in embryo and 4X in endosperm
   b. 4X in embryo and 7X in endosperm

(PART-B : Descriptive)

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

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

1. Write short notes on any two- 5+5=10
   a) Performation Theory
   b) Epigenetic Theory
   c) Recapitulation Theory
   d) Weisman's germplasm Theory

2. What is Artificial insemination explain with suitable examples? Explain A.I. Procedure in cattle. 6+4= 10

3. Explain the mechanism of cell differentiation in the genome and at transcription level. 5+5=10

4. Discuss spermatogenesis and its phases. Differentiate spermatogenesis and oogenesis. 7+3=10

5. Define fertilization. What is external and internal fertilization? What are the kinds of fertilization? 2+3+5=10

6. Explain Acrosomal reaction in Sea urchin egg cell with neat diagram. 8+2=10

7. Define Morphogens and its types. Explain the cellular basis and changes during morphogenesis. 5+5=10

8. Write short notes on any two- 5 +5=10
   a) Activation of ovum and Amphimixis
   b) Pre-vitellogenesis and Vitellogenesis
   c) Embryogenesis

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c. 4X in embryo and 6X in endosperm
d. 6X in embryo and 12X in endosperm

8. Pollen tube enters the ovule through the integuments. The process is called
   a. mesogamy
   b. porogamy
   c. pseudogamy
   d. Chalazogamy

9. Which is necessary for seed formation
   a. Flower
   b. Closed ovary
   c. Time gap between pollination and fertilization
   d. Megaspore should not release from ovary

10. Consider the following statement: Apomixisis is a phenomenon in which
   1. fertilization occurs regularly
   2. fertilization does not occur at all
   3. Embryo is form directly from egg
   4. Formed embryo may be haploid or diploid

   Which of the above statement is / are correct?
   a. 1 alone
   b. 1 and 3
   c. 1, 2 and 3
   d. 2, 3 and 4

11. The male germ unit (MGU) in angiosperms comprises of
   a. Vegetative nucleus and the generative cell
   b. Two sperm cell
   c. Vegetative nucleus and one of the cell
   d. Vegetative nucleus and two sperm cell

12. The golgi complex takes part in formation of
   a. Acrosome of spermatozoan
   b. Tail of spermatozoan
   c. Middle piece of spermatozoan
   d. Head of spermatozoan

13. Which of the following cell organelles participates in the constriction of daughter blastomeres during cleavage
   a. microtubles b. microfilaments
   c. microsomes d. Micromeres

14. Acrosomal enzymes in a mammalian sperm originates from
   a. peroxysomes
   b. microsomes
   c. lysosomes
   d. Mitrochondria

15. In chordates, fertilization occurs

   a. When the egg is in the metaphase of the first meiotic division
   b. When the egg is in the metaphase of the second meiotic division
   c. After the completion of both the meiotic divisions
   d. Before the meiotic divisions

16. The purpose of gastrulation is to lay down the primordial germ layers which include
   a. Epidermis, endoderm and mesoderm
   b. Ectoderm, endoderm and mesenchyme
   c. Epidermis, dermis and mesoderm
   d. Ectoderm, endoderm and mesoderm

17. Consider the following laws and theories:
   1. Biogenetic Law
   2. Theory of germplasm
   3. Theory of epigenesist
   4. Theory of performation

   The correct chronological sequence in which these theories in developmental biology were propounded is
   a. 4,3,1,2 b. 4,3,2,1
   c. 3,4,1,2 d. 3,4,2,1

18. During the early stages of development, either in the egg condition or early blastulation, various parts could be correlated with the various future parts of the embryo and this mapping is termed
   a. organogeny b. organizer
   c. Fate map d. Fate link

19. If the amount and distribution of yolk in an egg is changed, which of these will be mainly affected
   a. Number of blastomeres b. Formation of zygote
   c. fertilization d. Pattern of cleavage

20. In gymnosperms, the endosperm is
   a. haploid b. diploid
   c. triploid d. polypoid

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