

B.SC. BIOTECHNOLOGY
SEMESTER-III
DEVELOPMENTAL BIOLOGY
BBT-303

Duration: 3 Hrs.

Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.

Marks: 50

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

1. Explain control of differentiation at the level of Transcription and Translation 5+5=10
2. Define Embryogenesis and its phases. 2+8= 10
3. What do you mean by double fertilization? Explain embryo development in plants with diagram. 3+5+2=10
4. Discuss Oogenesis and its phases. Differentiate spermatogenesis and spermiogenesis. 1+6+3=10
5. What is fertilization? Describe Acrosomal Reaction and Penetration method of fertilization with diagram. 2+6+2=10
6. What is Apomixis? What are the types of Apomixis and its significance 3+3+4=10
7. Define Morphogenesis. What are the changes during morphogenesis. Explain with developmental commitment of a cell. 5+3+2=10
8. *Write short notes on:* 5+5=10
 - a. polyembryony
 - b. Fertilizin and Antifertilizin

**B.SC. BIOTECHNOLOGY
SEMESTER- 3RD
DEVELOPMENTAL BIOLOGY
BBT-303**

[PART-A : Objective]

I. Choose the correct answer from the following :

1X20=20

1. Spermiogenesis is the transformation of
 - a. Spermatogonium into primary spermatids
 - b. Spermatogonium into functional spermatozoa
 - c. Spermatogonium into secondary spermatocytes
 - d. Spermatids into spermatozoa
2. The amnion in mammals consists of extra embryonic
 - a. Endoderm and somatic mesoderm
 - b. Ectoderm and somatic mesoderm
 - c. Ectoderm and splanchnic mesoderm
 - d. Endoderm and splanchnic mesoderm
3. During fertilization, the enzyme which facilitates penetration of the egg by the spermatozoan is
 - a. Acid phosphates
 - b. Alkaline phosphates
 - c. hyaluronidase
 - d. Acetylcholinestrace
4. Consider the following statements
Placenta present in mammals acts as an endocrine tissue and produces
 1. Human Chorionic Gonadotrophin
 2. Estrogen
 3. Progesterone
 4. Testosterone
 - a. 1 and 4
 - b. 2, 3 and 4
 - c. 1, 2 and 3
 - d. 1 and 2
5. The correct sequence of formation of spermatozoa is
 - a. Spermatogonia- spermatids – spermatocytes - spermatozoa
 - b. Spermatids Spermatogonia— spermatocytes - spermatozoa
 - c. Spermatids – Spermatogonia- primary spermatocytes - secondary spermatocytes- spermatozoa
 - d. Spermatogonia primary spermatocytes - secondary spermatocytes – spermatids – spermatozoa
6. After fertilization, the vitelline membrane gets separated from the plasma membrane. This is
 - a. To prevent polyspermy
 - b. To maintain osmotic tension
 - c. To free cell movement during gastrulation
 - d. To facilitate cleavage
7. Dicot embryo consists of
 - a. Radical and plumule
 - b. Radical, plumule and cotyledons, sometimes endosperm
 - c. Radical, plumule, cotyledons and tegmen
 - d. Radical, plumule, cotyledons, tegmen and testa
8. In two-celled embryo, the cell towards the antipodal end is termed as
 - a. Suspensor cell
 - b. epiphysis
 - c. Embryonal cell
 - d. hypophysis
9. What is true about cells during cleavage?
 - a. Their divisions resemble ordinary mitosis
 - b. They move from animal pole to vegetal pole
 - c. They consume little oxygen
 - d. They do not grow in size
10. Which of the cells divide to form two unequal cells
 - a. Microspore mother cell
 - b. Microspore
 - c. Megaspore mother cell
 - d. megaspore
11. If an embryo undergoes 13 cleavage divisions during embryogenesis, then the size of the embryo compared to zygote
 - a. remains almost the same size
 - b. Increase in an exponential fashion
 - c. Increase only 5 times
 - d. Increases 13 times
12. The slow block of polyspermy develops response to the
 - a. Openings of sodium gates in the plasma membrane
 - b. Release of bindin
 - c. Spreading of the fertilization cone around egg
 - d. Formation of fertilization membrane
13. Coconut has
 - a. Nuclear endosperm
 - b. Cellular endosperm
 - c. Both nuclear and cellular
 - d. albuminous
14. The golgi complex takes part in formation of
 - a. Middle piece of spermatozoan
 - b. Tail of spermatozoan
 - c. Acrosome of spermatozoan
 - d. Head of spermatozoan

15. The egg with uniform distribution of yolk is termed as

- a. mesolecithal
- b. telolecithal
- c. isolecithal
- d. alecithal

16. During reproductive development in plants:

- 1. Male and female gametes are produced as a result of two mitotic divisions after meiosis
- 2. Vegetative cells in pollen contribute to pollen development
- 3. Antipodals provide nourishment to developing embryos
- 4. Pollen tube ruptures and releases both the male gametes in one of the degenerate synergids

- a. 2 and 4
- b. 1 and 2
- c. 3 and 2
- d. 1 and 4

17. The chemical substance found in the surface layer of cytoplasm of spermatozoa is

- a. Hyaluronidase
- b. Agglutin
- c. Fertilizin
- d. Antifertilizin

18. During fertilization polyspermy is prevented by

- a. Zona pellucida in the presence of Na^+ ions
- b. Vitelline membrane in the presence of Ca^{2+} ions
- c. Cortical graules in the presence of Ca^{2+} ions and Na^+ ions
- d. Influx of Na^+ , Ca^{2+} ions and Mg^{2+} ions

19. The group of cells which generates the vascular tissues including the pericycle in roots of higher plants are called

- a. procambium
- b. protoderm
- c. Ground meristem
- d. Apical meristem

20. In the unfertilized egg, inactivated NAD kinase is made active only

- a. When the second polar body of the egg has been discharged
- b. When capacitation and contact between the gametes have been established
- c. After the penetration of the sperm head into the vicinity of the egg plasma membrane
- d. When the second polar body of the egg has been discharged

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA



[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Serial no. of the
main Answer sheet

Course :

Semester : Roll No :

Enrollment No : Course code :

Course Title :

Session : 2017-18 Date :

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Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- Students shall tick (✓) the correct answer.
- No marks shall be given for overwrite / erasing.
- Students have to submit the Objective Part (Part-A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	

Scrutinizer's Signature

Examiner's Signature

Invigilator's Signature