(6 pages) **Reg. No. :** .....

**Code No. : 6421** **Sub. Code : HZOM 13**

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2014.

First Semester

Zoology

DEVELOPMENTAL BIOLOGY

(For those who joined in July 2012 onwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. The human sperm head is covered by a membrane enclosed structure called ————

(a) head (b) neck

(c) middle piece (d) acrosome

2. The genetic part of a human sperm is

(a) neck (b) tail

(c) head (d) middle piece

3. The spiral pattern of cleavage is seen in

(a) synapta (b) amphioxus

(c) annelids (d) none of these

4. The cell division seen during cleavage is

(a) mitotic cell division

(b) meiotic cell division

(c) amitotic cell division

(d) none of these

5. Morphogenes are ————

(a) soluble molecules

(b) insoluble molecules

(c) both (a) and (b)

(d) insolule and crystallized molecules

6. Class of molecules involved in morphogenesis are transaction factor proteins that determines the fate of cells by ————

(a) avoiding DNA

(b) interacting with t-RNA

(c) interacting with DNA

(d) interacting with m-RNA

7. The edges of neural plate are folded and elevated to form

(a) medullary plate (b) neural fold

(c) neural groove (d) neural tube

8. The origin of digestive tract is from

(a) ectoderm (b) endoderm

(c) mesoderm (d) neuroderm

9. The theory of organizer was formulated by

(a) Tiedmann (b) Robert Brown

(c) Spemann (d) None of these

10. The inductor causes induction by liberating a chemical substance called

(a) organizer chemical (b) evocator

(c) belly-piece (d) none of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What is the acrosome of the sperm cell? How is it formed?

Or

(b) Explain the polarity of ovum production.



12. (a) Explain the balstocyst expands within the zona pellucida.

Or

(b) Describe the types of cleavage in human reproductive system.

13. (a) Explain the cell movement in the epiblast during gastrulation and neurulation in human embryos.

Or

(b) Describe the series of normal stages in the development of the sea urchin.

14. (a) Explain the development of ectodermal organs neurulation in vertebrate development.

Or

(b) Describe the development of eye and explain the factors involved in eye formation.

15. (a) Write a brief account on theory of organizer and inductor.

Or

(b) Describe the chemical basis of neural induction and its formation.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Define the term gonads? Describe the male and the female gonads in humans.

Or

(b) Explain the basic morphology and how and why do the male and the female gametes differentiate from each other?

17. (a) Write the brief notes on cleavage of annelids and molluscs reproductive system.

Or

(b) Describe the major types of cleavage are seen and referred to as holoblastic (or complete cleavage) and meroblastic (or incomplete cleavage).

18. (a) Describe the geometry and mechanics of teleost gastrulation and the formation of primary embryonic axes.

Or

(b) Mention the role of Activin and its receptors during gastrulation and the later phases of mesoderm development in the chick embryo.



19. (a) During the development of the somatic ectoderm, the ectoderm developes into a number of structures. These epidermal derivatives normally form in many stages. Explain these stages in the correct order.

Or

(b) Describes the formation of the external ear (external auditory meatus) in vertebrate development.

20. (a) Describe the neural induction : a decision between epidermis and neural plate.

Or

(b) Describe mechanisms that cause the differentiation during embryonic development.

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