

# Important Questions on Morphogenesis and Organogenesis in Animals



1. In Drosophila body plan which portion produces the wings?

- A. Thorax
- B. Abdomen
- C. Telson
- D. Dorsal

2. Development of anterior posterior or dorsal-ventral establishments of body are known as?

- A. Morphogenesis
- B. Division
- C. Pattern formation
- D. Differentiation

3. In cell folding of sheet, migration of cells and cell death are representing the mechanism of:

- A. Differentiation
- B. Pattern formation
- C. Morphogenesis
- D. Cleavage division

4. Statements are given about regeneration of mammalian nervous system:

I) In mammalian nervous system fully, functional nervous system has been possible only when adult stem cell transplant is used

II) Brain cell can regenerate after damage. But peripheral nervous system is incapable of regeneration

Which is the correct option?

- A. A
- B. B
- C. Both
- D. None

5. Two statements about embryonic development of vertebrate are given:

I. Amnion and chorion have no blood vessel in chick.

II. In mammalian egg there is almost no yolk so no yolk sac is found.

Choose the correct option.

- A. I
- B. II
- C. Both
- D. None

6. Match the following and choose the correct options of cleavage pattern and group of animals.

I) Radial

II) Spiral Holoblastic

III) Bilateral

IV) Determinative

A) Coelenterate

B) Mollusca

C) Echinodermata

D) Ascidia

Options

- A. I-A, II-B, III-D, IV-C
- B. I-C, II-B, III-D, IV-A
- C. I-D, II-B, III-C, IV-A
- D. I-A, II-B, III-D, IV-C

7. Match the following and choose the option with correct match.

- I) Zona Radiata
  - II) Amnion
  - III) Primitive streak
  - IV) Dorsal lips of blastopore
- A) Mammalian ovum
  - B). Chicks Gastrula
  - C). Amphibian gastrula
  - D). Reptilian embryo
- A. I-A, II-D, III-B, IV-C
  - B. I-B, II-D, III-A, IV-C
  - C. I-A, II-B, III-D, IV-C
  - D. I-A, II-C, III-B, IV-D

8. Zygotic hunchback expression is activated by Bicoid protein. What is the principle behind this establishment of positional information in embryo?

- A. A cascade of gene activation occurs in syncytial blastoderm.
- B. The mother can influence development through the packaging of material in to the egg.
- C. A gradient of protein can activate the gene in a discrete region of embryo through a threshold effect.
- D. The identity of segment in embryo is a reflection of their position in the embryo.

9. Four statements are given below, choose the correct one:

- A. Adult human bone grows only at extreme end (Epiphysis).
- B. Adult human bone grows throughout its length.
- C. Adult human bone grows only in the centre.
- D. Adult human bone grows at growth plate, in between epiphysis and diaphysis.

10. Separation of cell into three germ layers occurs first during embryogenesis in which of the stage?

- A. Neuralisation
- B. Gastrulation
- C. Organogenesis
- D. Cleavage

**###ANSWERS###**

1. A
2. C
3. C
4. D
5. D
6. B
7. A
8. C
9. D
10. B



**###SOLUTIONS###**

1. Ans. A.

In the fruit fly *Drosophila*, development of wings occurs by thorax region.

2. Ans. C.

Symmetrical pattern of body axis is described by axis of body and for establishment of distinct body plan axis formation or pattern formation is necessary; anterior posterior or dorsal -ventral establishments of body are termed pattern formation.

3. Ans. C.

In cell folding of sheet, migration of cells and cell death are representing the mechanism of morphogenesis.

4. Ans. D.

In some instances, peripheral nervous system is able to regenerate an Axon if there is a cut in axon. For example, motor neurons regenerate axon to make correct connections with muscle.

5. Ans. D.

In chicks, amnion have blood vessels; in mammals three fetal membrane are found yolk sac, allantoin and amnion, mammals have small yolk with yolk palettes.

6. Ans. B.

In development of animal's cleavage patterns, it is observed that Molluscs have spiral symmetry, Echinodermata have radial symmetry, Ascidia have bilateral symmetry and coelenterate have determinative symmetry. In radial symmetry, organism can be divided into a similar halves at any angle along a central axis. Spiral holoblastic cleavage is a arrangement of blastomere in which upper tier is over of cell junction and lower is below. In bilateral, organ can be divided to left to right.; determinative is a specification of gastrulation of body plan in coelenterates.

7. Ans. A.

Zona radiata also known as zona pellucidum in mammals that regulate essential transition from follicle to oocyte. Reptiles are the first amniotes which produce leathery amniotic eggs. In chicks, primitive streak is observed as gastrulation stage. In amphibians, dorsal lips of blastopores work as organiser in amphibian gastrula.

8. Ans. C.

In Zygotic hunchback expression, gradient of protein can activate the gene in a discrete region of embryo through a threshold effect.

9. Ans. D.

In bone development until adolescence condition, at growth plate, hyaline cartilage persists; which is the region between diaphysis and epiphysis and that region is responsible for the growth in length of long bones.

10. Ans. B.

After fertilization, the zygote undergoes series of divisional process called cleavage, in which first blastula formation occurs which is hollow spherical shape, then after gastrulation occurs in which embryo is divided into three germ layers.

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