



BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme – Bachelor Of Science Honours In Biotechnology

Course Name - Developmental Biology

Course Code – BBTH010501

(Semester – 1)

Time allotted: 3 Hours

Full Marks: 70

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question)

20 x 1 = 20

1. *Choose the correct alternative from the following (Answer any Twenty)*
 - (i) The correct order of the stages of early development is:

a. Fertilization-->Gametogenesis-->Blastulation-->Gastrulation.	b. Gametogenesis-->Fertilization-->Blastulation-->Gastrulation.
c. Fertilization-->Gametogenesis-->Gastrulation-->Blastulation.	d. Gametogenesis-->Fertilization-->Gastrulation-->Blastulation.
 - (ii) Which of the followings processes is used to detect the mRNA expression in a developing embryo?

a. In-situ hybridization	b. Southern blotting
c. Western blotting	d. Cell sorting
 - (iii) The experiments of Spemann and Mangold first defined which feature of amphibian embryos?

a. The zygote.	b. The neural tube.
c. The blastopore.	d. The organizer.

- (iv) Epimorphosis is regeneration through;
- Repatterning of existing cells, as occurs in Hydra.
 - The reinitiation of division in existing cells, followed by patterning, as occurs in Hydra.
 - The formation of blastema, followed by patterning, as occurs in amphibians such as newts.
 - Repatterning of existing cells, as occurs in amphibians.
- (v) The product of cleavage in a zygote produces a cluster of small cells called;
- Gastrula
 - Blastomere.
 - Yolk.
 - Polar bodies.
- (vi) Which of the followings is used as a vertebrate model organism in developmental biology study?
- Drosophila
 - Hydra
 - Arabidopsis
 - Zebrafish
- (vii) Which one of the followings is the example of a juxtacrine signaling?
- Notch signaling.
 - Hedgehog signaling.
 - FGF signaling.
 - Wnt signaling.
- (viii) Which of the following is not a primary organizer?
- Hensen's Node.
 - Primitive streak.
 - Dorsal Lip of Blastopore.
 - Plaecnta
- (ix) Involution movements starts in;
- Gastrulation of Frog.
 - Blastulation of Frog.
 - Gastrulation of Chick.
 - Blatulation of Chick.
- (x) Which of the following options cannot be used as adsorbent in Column adsorption chromatography?
- Magnesium oxide
 - Silica gel
 - Activated alumina
 - Potassium permanganate
- (xi) Pax 6 genes are involved in;
- Induction during eye development.
 - Induction during brain development.
 - Morphogenetic movement.
 - Neural crest cell migration.
- (xii) Which of the foowing act as teratogen?
- Aminopterin
 - Alcohol at high level.
 - Methotrexate.
 - All of the above.

- (xxiv) The extra embryonic membranes of the mammalian embryo are derived from
- | | |
|--------------------|--------------------|
| a. trophoblast | b. inner cell mass |
| c. formative cells | d. follicle cells. |
- (xxv) The mammalian corpus luteum produces
- | | |
|-------------------------|------------------------|
| a. luteotrophic hormone | b. luteinizing hormone |
| c. estrogen | d. progesterone. |

Group – B

(Short Answer Type Questions)

4 x 5 = 20

Answer any *four* from the following

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|--|-----|
| 2. Compare between the theory of Preformation and theory of Epigenesis. Describe a short note on embryonic stage of blastula with a diagram. | 2+3 |
| 3. Describe a short note about the concept of stem cell with example. Categorize the potency-specific stem cells with examples. | 5 |
| 4. Write a short note on “fate map”. Explain the fate map analysis process with a diagram. | 2+3 |
| 5. What is polyspermy? What are the mechanisms by which sea urchin restrict the polyspermy after fertilization? | 1+4 |
| 6. What are the various components of signal transduction process? Explain with an appropriate example. | 5 |
| 7. Explain the process of head induction during hydra regeneration. | 5 |

Group – C

(Long Answer Type Questions)

3 x 10 = 30

Answer any *three* from the following

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|-----|-----|---|----|
| 8. | (a) | Compare the process of holoblastic and meroblastic cleavage process with appropriate examples. | 6 |
| | (b) | What is centrolecithal egg? Cite an example. What type cleavage is found in centrolecithal egg? | 4 |
| 9. | (a) | What is spermiogenesis? | 3 |
| | (b) | State the process of spermiogenesis. | 7 |
| 10. | | What is IVF? Explain its steps with necessary diagram. | 10 |
| 11. | (a) | State the differences between – Radial and spiral cleavage. ? | 6 |
| | (b) | What is the role of yolk in cleavage? | 4 |
| 12. | (a) | What do you mean by specification and determination? What is amniocentesis? | 5 |
| | (b) | i) State the type stem cells? | 2 |
| | (c) | What is the significance of having stem cells during development of an organism? | 3 |
