

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)

 $20 \times 1 = 20$

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

(xiii)	ii) Which of the following hormone(s) is (are) secreted from placenta?						
	a.	Estrogen.	b.	Progesterone.			
	c.	Human Chorionic gonadotrophin (hCG).	d.	All of the above.			
(xiv)	xiv) Human eggs are						
	a.	Alecithal	b.	Microlecithal			
	c.	Mesolecithal	d.	Macrolecithal			
(xv)	Egg is	liberated from ovary in					
	a.	secondary oocyte stage	b.	primary oocyte stage			
	c.	oogonial stage	d.	mature ovum stage			
(xvi)	Gona	ds develop from embryonic					
	a.	ectoderm	b.	endoderm			
	c.	mesoderm	d.	both mesoderm and endoderm.			
(xvii)) How many sperms are formed from a secondary spermatocyte?						
	a.	4	b.	8			
	c.	2	d.	1			
(xviii)	ii) Freshly released human egg has						
	a.	one Y-chromosome	b.	one X-chromosome			
	c.	two X-chromosome	d.	one X-chromosome and one Y-chromosome			
(xix)	Middle piece of mammalian sperm possesses						
	a.	mitochondria and centriole	b.	mitochondria only			
	c.	centriole only	d.	nucleus and mitochondria.			
(xx)	Meroblastic cleavage is a division which is						
	a.	horizontal	b.	partial/parietal			
	c.	total	d.	spiral			
(xxi)	In telo	lecithal egg the yolk is found?					
	a.	all over the egg	b.	on one side			
	c.	both the sides	d.	centre.			
(xxii)	Acros	some reaction in sperm is triggered	by				
	a.	capacitation	b.	release of lysine			
	c.	influx of Na+	d.	release of fertilizin.			
(xxiii)	s of						
	a.	Sertoli	b.	epithelial			
	c.	spermatocytes	d.	leydig			

(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)	$4 \times 5 = 20$
Ansv	wer any four from the following	
2.	Compare between the theory of Preformation and theory of Epigenesis Describe a short note on embryonic stage of blastula with a diagram.	s. 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.	n 5
7.	Explain the process of head induction during hydra regeneration.	5

Group - C

		(Long Answer Type Questions)	$3 \times 10 = 30$
Ansv	wer ar	ny three from the following	
8.	(a)	Compare the process of holobastic and meroblastic cleavage process with appropriate examples.	(
	(b)	What is centrolecithal egg? Cite an example. What type cleavage is found in centrolecithal egg?	2
9.	(a)	What is spermiogenesis?	3
	(b)	State the process of spermiogenesis.	7
10.		What is IVF? Explain its steps with necessary diagram.	
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	. 3

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