

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****B.Sc. DEGREE EXAMINATION – ADVANCED ZOOLOGY AND BIOTECHNOLOGY****THIRD SEMESTER – NOVEMBER 2022****UAZ 3503 – DEVELOPMENTAL BIOLOGY**

Date: 28-11-2022

Dept. No. 

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**SECTION A****Answer ALL the Questions**

<b>SECTION A</b>			
<b>Answer ALL the Questions</b>			
<b>1.</b>	<b>Choose the correct answer</b>	<b>(5 x 1 = 5)</b>	
a)	In this type of cell specification, cell fate is fixed only as development proceeds depending on its environment. (i) autonomous (ii) syncytial (iii) conditional (iv) mosaic	K1	CO1
b)	Which one of the following is a characteristic feature of the frog gastrula? (i) tertiary mesenchyme cells (ii) Hensen's node (iii) inner cell mass (iv) bottle cells	K1	CO1
c)	Embryonic stem cells are obtained from the (i) foetal notochordal ridge (ii) inner cell mass of blastocysts (iii) embryonic mesoderm (iv) trophoblast of blastocysts	K1	CO1
d)	Mutations in these developmental genes of <i>Drosophila</i> sp. lead to formation of mirror image duplications of all or part of each segment. (i) gap genes (ii) pair-rule genes (iii) segment polarity genes (iv) even-skipped genes	K1	CO1
e)	The congenital defect caused by Zika virus infection during pregnancy is (i) atriosis (ii) keratosis (iii) microcephaly (iv) hydrocephaly	K1	CO1
<b>2.</b>	<b>State whether True or False</b>	<b>(5 x 1 = 5)</b>	
a)	Mosaic development is seen in fertilized eggs of <i>Drosophila</i> sp.	K1	CO1
b)	Primitive streak is formed during gastrulation in bird embryos.	K1	CO1
c)	During brain development, the rhombencephalon becomes divided into the mesencephalon and myelencephalon.	K1	CO1
d)	Mesenchymal stem cells can be obtained from the bone marrow.	K1	CO1
e)	The birth defect spina bifida is caused due to retinoic acid deficiency.	K1	CO1
<b>3.</b>	<b>Fill in the blanks</b>	<b>(5 x 1 = 5)</b>	
a)	Secondary oocytes formed in the ovary get arrested at the _____ stage of the meiosis.	K2	CO1
b)	The germ layer formed by the primary mesenchyme cells during sea urchin gastrulation is _____	K2	CO1
c)	The _____ gland arises from an evagination from the upper side of the diencephalon.	K2	CO1
d)	The use of stem cells to replace old/damaged cells or organs is known as _____ medicine.	K2	CO1
e)	Environmental agents that disturb embryonic development are known as _____	K2	CO1

<b>4.</b>	<b>Match the following</b>	<b>(5 x 1 = 5)</b>	
a)	Polar bodies – arises from ectoderm	K2	CO1
b)	Primary organizer – assisted reproductive technology	K2	CO1
c)	Neural tube – dorsal lip of blastopore	K2	CO1
d)	Morphallaxis – oogenesis	K2	CO1
e)	GIFT – hydra regeneration	K2	CO1
<b>SECTION B</b>			
<b>Answer any TWO of the following in 100 words</b>		<b>(2 x 10 = 20)</b>	
5.	Illustrate the various stages of spermatogenesis with appropriate explanations.	K3	CO2
6.	Explain the different types of cleavage with suitable examples.	K3	CO2
7.	Examine the genetic causes of congenital abnormalities giving examples	K3	CO2
8.	What is the correlation between regeneration and aging?	K3	CO2
<b>SECTION C</b>			
<b>Answer any TWO of the following in 100 words</b>		<b>(2 x 10 = 20)</b>	
9.	Infer the role of organizers and inducers in embryonic development.	K4	CO3
10.	Illustrate and explain the different types of morphogenetic movements seen during embryonic development.	K4	CO3
11.	Explain eye development in vertebrate embryos.	K4	CO3
12.	Examine the causes and consequences of multiple pregnancy.	K4	CO3
<b>SECTION D</b>			
<b>Answer any ONE of the following in 250 words</b>		<b>(1 x 20 = 20)</b>	
13.	Construct a flowchart of the major steps in Salamander limb regeneration along with suitable diagrams.	K5	CO4
14.	Summarize the procedure for <i>in vitro</i> fertilization.	K5	CO4
<b>SECTION E</b>			
<b>Answer any ONE of the following in 250 words</b>		<b>(1 x 20 = 20)</b>	
15.	Compose an essay to elaborate the changes leading to heart development in vertebrate embryos.	K6	CO5
16.	Compile the events leading to egg fertilization in sea urchin.	K6	CO5

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