



**NAVRACHANA
UNIVERSITY**
a UGC recognized University

School: School of Science
Program/s: Biomedical Science
Year: 2nd **Semester:** VII
Examination: End Semester Examination
Examination year: December - 2021

Course Code: BM401 **Course Name:** Developmental Biology
Date: 01/12/2021
Time: 02:30 pm to 04:30 pm

Total Marks: 40
Total Pages: 02

Instructions:

- Answer each section (major questions) on a new page.
- Use of a calculator is permitted/not permitted: NA
- Any other relevant instructions if any: make neat and clean diagrams wherever necessary

		Marks	CO	BT
Q.1	A. Choose the correct answer.	10	CO2	BT 1
	1. Cell to cell communication is important in the development of an organism. The ability of cells to respond to specific inductive signals.	(5 x 1)		BT 2
	a. Regional specificity of induction b. Competence c. Juxtacrine signaling d. Instructive interaction			
	2. Lens formation requires sequential events whereby the anterior neural plate signals the anterior ectoderm to promote secretion of Pax6, which renders the anterior ectoderm more receptive to secretions from the optic vesicle. The above can be best explained by which of the following phenomena?			
	a. Instructive interaction only b. Permissive interaction c. Epithelial-mesenchymal interaction d. Induction and competence			
	3. Muscles and excretory system arises from			
	a. Mesoderm b. Ectoderm c. Endoderm d. All the three			
	4. The process in which the ectoderm covers the entire embryo is called as			
	a. Morula b. Blastula c. Epiboly d. Endoderm			
	5. The process during which the neural tube begins to form is called			
	a. morulation b. neurulation c. gastrulation d. blastulation			
	B. Provide short answers.	(5 x 1)		
	1. Define Epiboly.			
	2. What is the function of neural crest cells?			
	3. Define primordial follicle.			
	4. what is the role to theca cells and granulosa cells during oogenesis?			

	5. Define the stages where oocyte cell cycle is arrested.																											
Q.2	<p>Explain in brief. Any 5</p> <ol style="list-style-type: none"> 1. Define competence and induction and give an example. 2. With reference to pancreas development, answer the following: <ol style="list-style-type: none"> a. In an individual, ectopic budding of pancreatic structures were seen. Suggest the possible reason b. Which marker gene expression determines the location of pancreatic duct development? c. In an individual normal Neurogenin-3 expression was seen, yet, there was no endocrine cell differentiation. Cite the possible reason. 3. What are the two factors required for induction of prospective hepatic endoderm and further its differentiation into hepatic cords? 4. Describe the process of neural tube formation in frog. 5. What is gray crescent and what is its significance in development? 6. What is mid blastula transition? 	10 (2 x 5)	CO3 CO4	BT 1 BT 2																								
Q.3	<p>Match A with B and C</p> <table border="1"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Graphinian follicle</td> <td>Retinoic acid</td> <td>Multiplication phase</td> </tr> <tr> <td>2</td> <td>Primordial germ cells</td> <td>FGF9</td> <td>up regulation</td> </tr> <tr> <td>3</td> <td>Spermatogonia</td> <td>Antrum</td> <td>Down regulation</td> </tr> <tr> <td>4</td> <td>Stra8</td> <td>Bipotential</td> <td>SCF</td> </tr> <tr> <td>5</td> <td>Sertoli cells</td> <td>Adult stem cell niche</td> <td>secondary oocyte</td> </tr> </tbody> </table>		A	B	C	1	Graphinian follicle	Retinoic acid	Multiplication phase	2	Primordial germ cells	FGF9	up regulation	3	Spermatogonia	Antrum	Down regulation	4	Stra8	Bipotential	SCF	5	Sertoli cells	Adult stem cell niche	secondary oocyte	10	CO1	BT 1 BT 2
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Q.4	<p>Explain in detail. (Provide figures if necessary) Any 2</p> <ol style="list-style-type: none"> 1. What is meant by the statement that the default state of naïve ectoderm is neural and not epidermal? How does the anterior part of chordamesoderm in amphibians induce neural differentiation? 2. Describe in detail the process of blastulation and gastrulation in frog. 3. Bringing out the essential differences, write a short note on primary induction and secondary induction. 	10 (5 x 2)	CO 1 CO3 CO4	BT 1 BT 2																								

*****End of Question Paper*****