



**NAVVRACHANA
UNIVERSITY**

a UGC recognized University

School: School of Science
Program/s: Biomedical Science
Year: 5th **Semester:** IX
Examination: End Semester Examination
Examination year: December - 2021

Course Code: BM502 **Course Name:** Regenerative biomedicine

Date: 01/12/2021

Time: 08:30 am to 10:30 am

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	CO 1	BT 1
	1. Adult stem cells are described as...	(7 x 1)	CO 2	BT 2
	a. Somatic c. Specialised		CO 3	
	b. Syngenic d. Both a and b		CO 4	
	2. Name 2 sources of "ethical" stem cells			
	a. Embryonic c. Bone Marrow e. Peripheral Blood			
	b. Cord Blood d. Foetal			
	3. Name two defining features of stem cells			
	a. Unspecialised cells which can specialise c. Mitosis e. Meiosis			
	b. Self renewal d. Proliferation.			
	4. A stem cell transplant using a patient's own stem cells is described as...			
	a. Syngenic c. Allogeneic			
	b. Autologous d. Allologous			
	5. What is the least invasive source of stem cells from the human body?			
	a. Cord blood c. Bone Marrow			
	b. Adipose tissue d. Heart			
	6. What is the process of cell specialisation called?			
	a. Proliferation c. Cryopreservation			
	b. Differentiation d. None of the above			

	<p>7. What is a stem cell?</p> <p>a. A cell only found in the stem of plants.</p> <p>b. An unspecialised cell with the ability to create specialised cells</p> <p>c. A specialised cell who can only generate cells of the same type</p> <p>d. Any cell of the body that can divide</p> <p>B. Provide short answers to the following.</p> <ol style="list-style-type: none"> 1. Define mesenchymal stem cells. 2. Define regeneration. 3. Define stem cell microenvironment. 	(3 x 1)																										
Q.2	<p>Explain in brief.</p> <p>Any 4</p> <ol style="list-style-type: none"> 1. What is the potential for therapeutic applications of stem cells? 2. How are Human embryonic stem cells produced? 3. What are the ethical considerations involving use of stem cells? 4. What are the characteristics of cardiac stem cells? 5. Write a brief note on adult neural stem cell niche. 6. Enlist vital parameters for the maintenance of a stem cell niche. 	12 (3 x 4)	CO 1 CO 2 CO 3 CO 4	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>Wnt-Beta catenin</td> <td>B cells</td> <td>Spermatogonial proliferation</td> </tr> <tr> <td>2</td> <td>Dermal papilla</td> <td>Sertoli cells/seminiferous tubules</td> <td>Cell-cell communication</td> </tr> <tr> <td>3</td> <td>glial cell line-derived neurotrophic factor</td> <td>Metastasis</td> <td>Beta -1 integrins</td> </tr> <tr> <td>4</td> <td>Resette structure</td> <td>Crypt epithelium</td> <td>Transit amplification</td> </tr> <tr> <td>5</td> <td>E-cadherin</td> <td>Follicular bulge</td> <td>FGF & EGF</td> </tr> </tbody> </table>		A	B	C	1	Wnt-Beta catenin	B cells	Spermatogonial proliferation	2	Dermal papilla	Sertoli cells/seminiferous tubules	Cell-cell communication	3	glial cell line-derived neurotrophic factor	Metastasis	Beta -1 integrins	4	Resette structure	Crypt epithelium	Transit amplification	5	E-cadherin	Follicular bulge	FGF & EGF	10	CO 1 CO 2 CO 3 CO 4	BT 1 BT 2
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Q.4	<p>Explain in detail. (Provide figures if necessary)</p> <p>Any 2</p> <ol style="list-style-type: none"> 1. Describe the application of stem cells in diabetes and/or neuronal disorders? 2. What are the advantages of stem cell therapy in haematological disorders? Also describe autologous stem cell transplantation. 3. What are induced pluripotent stem cells? Explain in detail. 4. Write a note on the importance of epithelial to mesenchymal transition during the process of regeneration. 	08 (4 x 2)	CO 1 CO 2 CO 3 CO 4	BT 1 BT 2																								

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