


<b>Name:</b>			
<b>Enrolment No:</b>			
<b>UPES</b>			
<b>End Semester Examination, May 2024</b>			
<b>Course: Animal and Plant Biotechnology</b>			
<b>Semester: 6</b>			
<b>Program: BT-Biotechnology</b>			
<b>Course Code: HSBT3007</b>		<b>Duration: 3 Hours</b>	
		<b>Max. Marks: 100</b>	
<b>Instructions: Attempt all the questions</b>			
<b>S. No.</b>	<b>Section A</b>	<b>Marks</b>	<b>COs</b>
	<b>Short answer questions/ MCQ/T&amp;F</b> <b>(20Qx1.5M= 30 Marks)</b>		
<b>Q 1</b>	What is Gene Stacking?	<b>1.5</b>	<b>CO3</b>
<b>Q 2</b>	Define Transplastomics.	<b>1.5</b>	<b>CO3</b>
<b>Q 3</b>	Define Transgene Segregation Analysis.	<b>1.5</b>	<b>CO3</b>
<b>Q 4</b>	What is Tobacco Mosaic Virus (TMV) and Potato Virus X (PVX)?	<b>1.5</b>	<b>CO3</b>
<b>Q 5</b>	Selection Markers are genes encoding antibiotic or herbicide resistance proteins. True or false?	<b>1.5</b>	<b>CO2</b>
<b>Q 6</b>	What is Agrobacterium-Mediated Transformation?	<b>1.5</b>	<b>CO2</b>
<b>Q 7</b>	Define Plant viral vectors.	<b>1.5</b>	<b>CO3</b>
<b>Q 8</b>	Name two molecular techniques for analysis of transgenics.	<b>1.5</b>	<b>CO2</b>
<b>Q 9</b>	What is the importance of plant growth regulators.	<b>1.5</b>	<b>CO1</b>
<b>Q 10</b>	Define plant conservation in tissue culture.	<b>1.5</b>	<b>CO2</b>
<b>Q 11</b>	Define haploid and triploid production techniques in plant tissue culture?	<b>1.5</b>	<b>CO3</b>
<b>Q 12</b>	Define "Marker Genes" in Cell Biology?	<b>1.5</b>	<b>CO1</b>
<b>Q 13</b>	Define "Tissue freezing".	<b>1.5</b>	<b>CO1</b>
<b>Q 14</b>	What are the critical factors governing the successful development of primary cultures from animal tissues?	<b>1.5</b>	<b>CO1</b>
<b>Q 15</b>	What are the key challenges associated with the development of primary cultures from animal tissues?	<b>1.5</b>	<b>CO1</b>
<b>Q 16</b>	What are the most common contaminants encountered in animal cell culture?	<b>1.5</b>	<b>CO1</b>
<b>Q 17</b>	What are the various methods used for sterilization in plant tissue culture?	<b>1.5</b>	<b>CO3</b>
<b>Q 18</b>	Define: micropropagation, meristem culture, and embryo rescue in plant tissue culture?	<b>1.5</b>	<b>CO3</b>

<b>Q 19</b>	What methods are employed for plant conservation in tissue culture?	<b>1.5</b>	<b>CO3</b>
<b>Q 20</b>	What are the safety considerations associated with viral vector-based gene delivery methods?	<b>1.5</b>	<b>CO2</b>
<b>Section B</b> <b>(4Qx5M=20 Marks)</b>			
<b>Q 1</b>	What are the advantages of using organ culture in animal biotechnology?	<b>5</b>	<b>CO1</b>
<b>Q 2</b>	How do factors like cell type, immune response, and delivery route impact the efficacy of gene delivery techniques?	<b>5</b>	<b>CO2</b>
<b>Q 3</b>	What are the main challenges in translating regenerative medicine therapies from the lab to clinical practice?	<b>5</b>	<b>CO3</b>
<b>Q 4</b>	Explain the mechanisms behind targeted gene delivery and how it differs between various methodologies	<b>5</b>	<b>CO3</b>
<b>Section C</b> <b>(2Qx15M=30 Marks)</b>			
<b>Q 1</b>	What is bio active secondary metabolites by plant tissue culture? Mention various application of tissue culture for crop improvement.	<b>15</b>	<b>CO3</b>
<b>Q 2</b>	<p>Case Study: Primary Cell Culture vs. Suspension Culture</p> <p>Background: A pharmaceutical company is developing a new drug targeting a specific type of cancer cells. They need to establish a cell culture system to test the efficacy of the drug in vitro. The researchers are considering using either primary cell culture or suspension culture methods.</p> <p style="text-align: center;">(A)</p> <p>I. What is primary cell culture, and how does it differ from other cell culture methods? (1)</p> <p>II. What are the advantages and limitations of primary cell culture for this particular study? (2)</p> <p>III. Describe the process of establishing a primary cell culture from cancer tissue samples. (2)</p> <p>IV. How can primary cell culture accurately represent the tumor microenvironment compared to other culture methods? (2)</p> <p style="text-align: center;">(B)</p> <p>I. Explain the concept of suspension culture and its applications in cancer research. (2)</p>	<b>15</b>	<b>CO1</b>

	<p>II. What are the advantages and limitations of suspension culture compared to primary cell culture? (2)</p> <p>III. Describe the process of establishing a suspension culture for cancer cells. (2)</p> <p>IV. How can suspension culture be used to study cell proliferation, drug response, and signaling pathways in cancer cells? (2)</p>		
<p><b>Section D</b> (2Qx10M=20 Marks)</p>			
<b>Q 1</b>	Explain different types of nutrient media and plant growth regulators in plant regeneration.	<b>10</b>	<b>CO2</b>
<b>Q 2</b>	Describe Genetic fidelity of plants raised through tissue culture.	<b>10</b>	<b>CO3</b>