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( July )

BIOTECHNOLOGY

( Honours )

( **Animal and Plant Biotechnology** )

Marks : 56

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

Answer Question No. **1** which is compulsory and  
*any four* from the rest

1. Define and distinguish the following  
(any four) : 3×4=12
  - (a) Primary cell culture and Established cell lines
  - (b) Embryogenic stem cell and Tissue stem cell
  - (c) Embryogenesis and Organogenesis as process in plant tissue culture
  - (d) Anther and Ovary culture
  - (e) Primary cells vs. Cell lines

2. What are growth factors? Discuss the role of serum in animal cell culture. 4+7=11
3. "Transgenic biotechnology presents an exciting range of possibilities from feeding the hungry to preventing and treating diseases; however these promises are not without potential peril." Write a note on these 'exciting possibilities'. Also, what does the author mean by 'potential peril' regarding transgenic engineering? Elaborate. 5+6=11
4. Define totipotency. What do you mean by surface sterilization? What are the different components of plant tissue culture media? Elaborate. 2+3+6=11
5. What are artificial/synthetic seeds? How are they produced? Mention their applications and advantages, if any. 2+4+5=11
6. What is protoplast? How can protoplast be isolated from plant tissue? Differentiate between hybrids and cybrids. 1+7+3=11
7. What are Intellectual Property Rights? List the different types of IPRs and describe any three of them. 3+2+6=11

( 3 )

8. Write short notes on any *two* of the following : 5½×2=11

- (a) Applications of gene therapy in human welfare
- (b) Advantages of DNA-based molecular marker techniques
- (c) Applications of genetically modified plants

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