

**PARUL UNIVERSITY**  
**FACULTY OF APPLIED SCIENCE**  
**M.Sc. Winter October-2018-19 Examination**

Semester: 3

Date: 23/10/2018

Subject Code: 11202202

Time: 10:30 to 01:00pm

Subject Name: Cell Culture Technology and Tissue Engineering

Total Marks: 60

**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1. A) Essay type/ Brief note (4x2) (Each of 04 marks) (08)**  
 (a) Describe briefly clinical applications of stem cells therapy  
 (b) What is organ culture? Describe its various technique
- Q.1. B) Answer the following questions (Any two)**  
 (a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) (04)  
 1. What is a primary animal cell culture?  
 2. What are the minimal needs for maintaining culture media?  
 (b) How to isolate of Animal tissue? Describe any one technique. (04)  
 (c) Write a short note on Apoptosis, its mechanisms and its significance (04)
- Q.2. A) Answer the following questions.**  
 (a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) (04)  
 1. What are the different types of stem cells?  
 2. What methods are used for isolation and propagation of embryonic stem cells?  
 (b) Write a short note on knockout mice technology (04)
- Q.2. B) Answer the following questions (Any two)**  
 (a) Short note/ Multiple choice questions. (Each of 01 marks) (03)  
 1. Which is (are) the type(s) of cell line? A. Immortalized cell line B. Semi-continuous cell line C. Finite cell line D. A & C  
 2. Plant cells cannot be preserved by cryopreservation because A. The chloroplasts in plant cells are denatured by super high temperature B. Water stored in vacuole of plant cells form ice crystal in freeze and thaw C. Plant cells differentiate rapidly under cryopreservation D. The biological reaction of plant cells cannot be stopped by cryopreservation  
 3. Which is (are) the cell isolation method(s)? A. Explant culture B. Enzymatic method C. Mechanical method D. All of the above  
 (b) What are the basic techniques involved in mammalian cell culture? (03)  
 (c) Write a short note on micro propagation methods (03)
- Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks) (08)**  
 (a) How do somoclonal variations affect in vitro studies  
 (b) Briefly describe advantages of in vitro system of studies in research.
- Q.3. B) Answer the following questions (Any two)**  
 (a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks) (04)  
 1. Give examples of balanced salt solutions and growth media.  
 2. What are the advantages of using serum free media?  
 (b) Short note: Somatic hybridization (04)  
 (c) Short note: Adult stem cells (04)
- Q.4. A) Answer the following questions.**  
 (a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks) (04)  
 1. Plant cells can only grow in \_\_\_\_\_ medium.  
 2. \_\_\_\_\_ is a method used to preserve animal cells for a long time.  
 (b) Short note: differentiation and dedifferentiation (04)
- Q.4. B) Answer the following questions (Any two)**  
 (a) Short note/ Multiple choice questions. (Each of 01 marks) (03)  
 1. What is a callus? A. A status of mammalian cells is in undifferentiated form under rapid division B. A status of plants is in undifferentiated form under rapid division C. A status of plants is in differentiated form under rapid division D. A status of mammalian cells is in differentiated form under rapid division  
 2. Why subculture of cells is necessary? 1) No enough space for cell growth 2) Accumulation of toxins 3) No enough nutrients for cell growth  
 A. 1 & 2 only B. 2 & 3 only C. All of the above D. None of the above

3. What are the applications of cell culture? A. Chemical toxicity test B. Therapy for diseases  
C. Culturing embryonic cell to produce insulin D. All of the above

(b) define- Totipotency & callus.

**(03)**

(c) Describe Induced protoplast fusion.

**(03)**