

KATHMANDU UNIVERSITY  
End Semester Examination  
February/March, 2019

Mark Scored:

Level : B. Tech.

Year : III

Course : BIOT 304

Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date **MAR 01 2019**

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Mark "X" in the most appropriate box.

1. Cells are dissociated from tissues by enzymatic digestion using  
 hydrolyzing enzymes                       oxidizing enzymes  
 proteolytic enzymes                       none of the above
2. For the Haemocytometer slide, the volume of the chamber is,  
 0.001 mm<sup>3</sup>               0.01 mm<sup>3</sup>               0.1 mm<sup>3</sup>               1 mm<sup>3</sup>
3. Who is considered by some as the father of cell culture?  
 Sydney Ringer     William Roux     Ross Harrison     Alexis Carrel
4. If the split ratio is maintained at 1:8, the generation number after every passage increases by  
 2                       3                       4                       8
5. What number of Hela cells weigh 1 gram?  
 2.5 × 10<sup>6</sup>               2.5 × 10<sup>7</sup>               2.5 × 10<sup>8</sup>               2.5 × 10<sup>9</sup>
6. To increase viscosity the substance added to cell culture medium is  
 Serum                       Carboxy methyl cellulose  
 Hanks salt                       Earls salt
7. The number of doubling the cell population has undergone is known as.....  
 Passage number                       Generation number  
 Split ratio                       All of the above
8. Hayflick effect refers to  
 Unlimited replication capacity of cells     Limited replication capacity of cells  
 Transformed status of cells                       None of the above
9. Which type of cell culture is most reproducible?  
 Organ                       Explant                       Cell                       All of the above
10. Use of which salt would imply the use of sealed flasks with a gas phase of air?  
 Eagles                       Earls                       Hanks                       All of the above
11. Which of the radioactive nucleotide is used for measurement of DNA synthesis?  
 <sup>1</sup>H thymidin                       <sup>2</sup>H thymidine  
 <sup>3</sup>H thymidine                       None of the above

12. The lab space for ACC lab should have culture operation; washup, preparation, sterilization; storage and incubation area in the ratio of  
 4:2:1:1       4:4:2:1       2:1:1:4       4:1:1:2
13. Integrins, mediate cell-matrix adhesion via a specific motif usually containing the  
 GDR motif       RGD motif  
 RDG motif       All of the above
14. In practice, the osmolarity of cell culture media should be \_\_\_\_\_.  
 200-260 mosmol/Kg       260-320 mosmol/Kg  
 320-360 mosmol/Kg       360-4000 mosmol/Kg
15. Cell attachment is regained in Glass surface by treating with \_\_\_\_\_ mM magnesium acetate.  
 1       2       3       4
16. The most commonly used cryoprotectant, DMSO, is added at final concentration of \_\_\_\_\_.  
 5%       10%       15%       20%
17. Which of the following limit gaseous diffusion during cell culture?  
 Viscosity       Surface Tension/Foaming  
 Balanced Salt solution       All of the above
18. To maintain correct osmolarity, slightly \_\_\_\_\_ medium may be better for petri dishes.  
 Hypertonic       Isotonic  
 Hypotonic       All of the above
19. If the cell concentration is high and only the five diagonal squares within the central 1 mm<sup>2</sup> is counted (i.e., 1/5 of the total), then cells per ml is  
  $n \times 5 \times 10^4$         $n \times 10^4 / 5$   
  $2 \times n \times 5 \times 10^4$         $2 \times n \times 10^4 / 5$
20. Usually a suspension culture is ready for subculture if the cell concentration reaches \_\_\_\_\_.  
  $1 \times 10^4$  cells        $1 \times 10^5$  cells        $1 \times 10^6$  cells        $1 \times 10^7$  cells

SECTION "B"

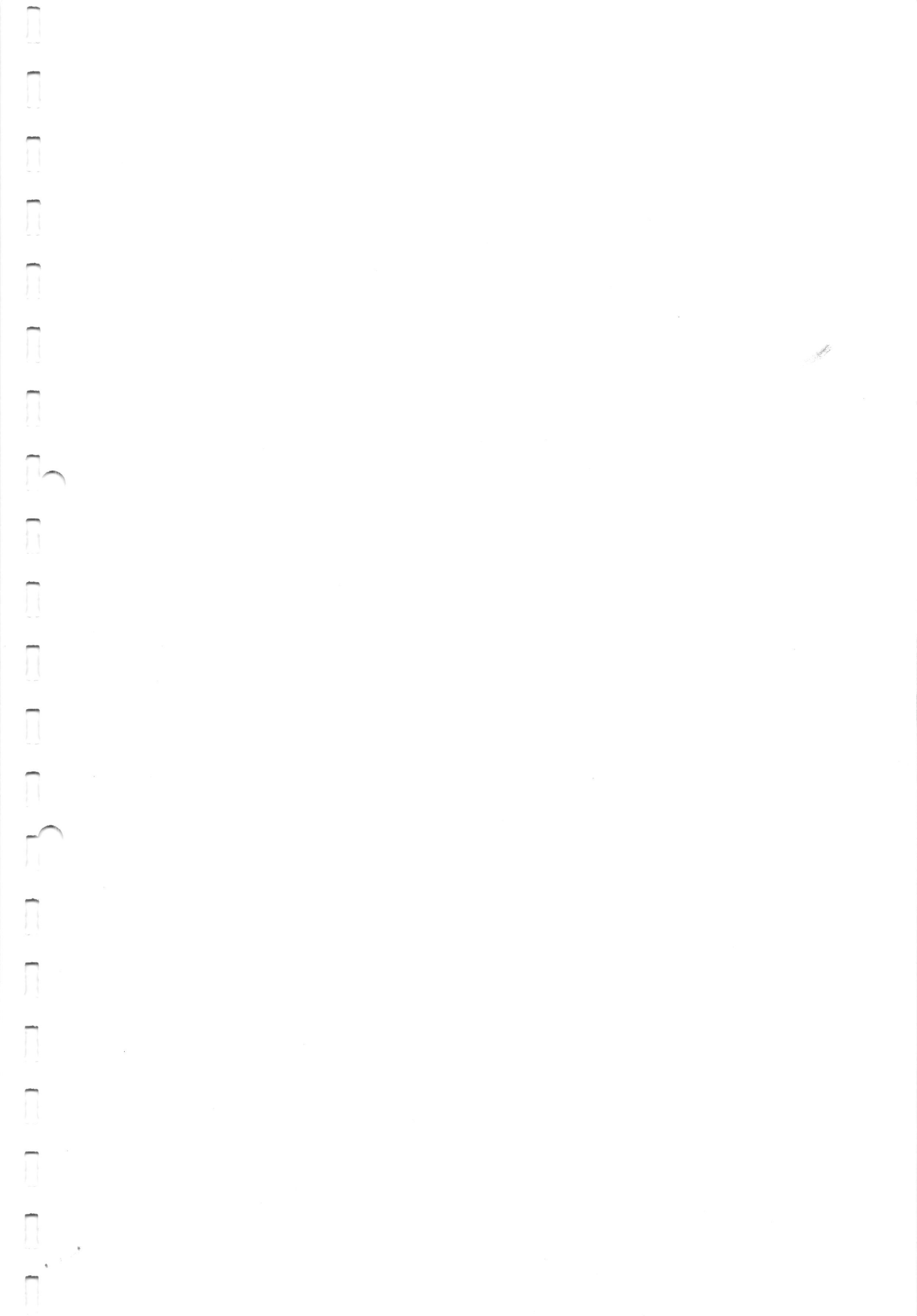
[10 Q × 1 = 10 marks]

Fill in the blanks.

21.  $\alpha$ 2-macroglobulin present in serum helps to inhibit \_\_\_\_\_.
22. CMC stands for \_\_\_\_\_.
23. Addition of \_\_\_\_\_ at concentration of 0.25 ug/ml, to subconfluent cells helps to make feeder layers.

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24. Non mammalian enzymes, such as Trypzean (Sigma), is a recombinant trypsin derived from \_\_\_\_\_.
25. Cell separation method in which a cell type specific antibody raised against a cell surface epitope is conjugated to the bottom of a petri dish is called \_\_\_\_\_.
26. During centrifugal elutriation the heavier cells collect at the \_\_\_\_\_ end.
27. In negative-pressure filtration systems, some dissolved CO<sub>2</sub> may be lost during filtration, and the pH may \_\_\_\_\_.
28. Mutagenesis assay can be done by \_\_\_\_\_.
29. Human \_\_\_\_\_ is the first recombinant protein to be licensed as a therapeutic agent.
30. For Organotypic assay, inflammation response, can be detected by measuring \_\_\_\_\_ in the test solution.



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Time : 2 hrs. 30 mins.

SECTION "C"

[3Q × 8 = 24 marks]

Attempt *ANY THREE* questions.

1. List out the various techniques used in cell separation? Explain how cloning can help in cell separation. [3+5]
2. Write a detailed flow chart for preparation of cell culture medium from powdered medium.
3. Describe the principle of cryopreservation. Write the flow chart of cell cryopreservation.
4. Discuss in detail the history of animal cell culture.

SECTION "D"

Attempt *ANY SIX* questions. (**Question 7 is compulsory**)

5. Explain the importance of bicarbonate buffer system in cell culture. [5]
6. Discuss the advantages of serum. [5]
7. Why is cell quantitation necessary? Enlist different cell quantitation techniques? How can haemocytometer help in cell quantitation? [1+2+3]
8. What are the advantages of animal cell culture? [5]
9. How is primary culture cell isolated by cold trypsinization method? [5]
10. Write in brief about cell adhesion in animal cell culture. How does a suspension cell differ from mono layer cells? [3+2]
11. Write short notes on (*ANY TWO*). [2×2.5=5]
  - a) T25 Flask
  - b) Laminar flow hood
  - c) Balanced salt solutions

