KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2018

Marks scored:

Level : B. Tech.
Year : III

Course : BIOT 304
Semester: I

Exam Roll No.:

Time: 30 mins

F. M. : 20

Registration No.:

Date : MAR 1 6 2018

SECTION "A"
[20 Q.× 0.5= 10 marks]

Mark "X" in the most appropriate box.

1) Who introduced proteolytic enzyme trypsin for the subculture of cells?
[ ] William Roux [ ] Alexis Carrel [ ] Carrel and Baker [ ] Rous and Jones

2) 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

3) Cell lines transformed under in vitro culture conditions give rise to,
[ ] Finite cell line [ ] Scattered cell line
[ ] Continuous cell line [ ] None of the above

4) For mechanical disaggregation, the chopped tissues are pressed through sieve of progressively of _____ mesh size.
[ ] Higher [ ] Lower
[ ] Equal [ ] None of the above.

5) Vaccum is needed in cell culture lab for _____.
[ ] Cleaning the lab [ ] Aspirate the medium
[ ] To maintain the CO_2 incubator [ ] Cleaning the Biosafety Cabinet

6) The main parameters for testing serum is
[ ] Plating efficiency [ ] Growth curve
[ ] Sterility [ ] All of the above

7) Nonviable cellls may be removed by centrifugation in a mixture of
[ ] Ficoll and sodium metrizoate [ ] Ficoll and sodium metrizamide
[ ] Dicoll and sodium metrizoate [ ] Ficoll and Potassium metrizamide

8) The making of continuous cell line often involves the deletion or mutation of the _____ gene, which would normally arrest cell cycle progression.
[ ] Oncogene [ ] Tumor suppressor
[ ] p53 [ ] All of the above.

9) Saturation density, which gives Cell density at plateau phase is expressed as
[ ] Cells/ml [ ] Cells/cm^2 [ ] Cells/L [ ] Cells/mm^2

10) _____ serum is preferred to calf serum by some workers, as it can be obtained from a closed donor herd and is often more consistent from batch to batch.

[ ] Bovine [ ] Fetal [ ] Cow [ ] Horse

11) Which of the radioactive nucleotide is used for measurement of DNA synthesis

[ ] ^{1}H thymidin
[ ] ^{2}H thymidin
[ ] ^{3}H thymidin
[ ] None of the above.

12) In 1870s, Sydney Ringer develops salt solutions for maintaining isolated animal _____outside the body in culture.

[ ] Liver [ ] Lung [ ] Heart [ ] Kidney

13) The attachment of _____ to actin microfilaments via linker proteins is associated with reciprocal signaling between the cell surface and the nucleus.

[ ] Integrins
[ ] RGD motif
[ ] Cytoskeletal
[ ] None of the above

14) In the United Kingdom, the use of embryos or fetuses beyond _____ gestation or incubation is regulated under the Animal Experiments.

[ ] 40% [ ] 50% [ ] 60% [ ] 80%

15) For type II alveolar cell isolation, combination of enzymes used are

[ ] Trypsin and DNase
[ ] Elastase and Trypsin
[ ] Elastase and DNase
[ ] Trypsin and Collagenase

16) A cell type specific antibody raised against a cell surface epitope is conjugated to the bottom of a petri dish in _____ method of cell separation.

[ ] Immuno staining
[ ] Immuno Panning
[ ] Magnetic Sorting
[ ] FACS

17) If the split ratio is maintained at 1:8, the generation number after every passage increases by

[ ] 2 [ ] 3 [ ] 4 [ ] 8

18) In dye uptake method the dye is normally taken up and _____ by viable cells

[ ] Retained
[ ] Released
[ ] Amplified
[ ] None of the above

19) Quantitation of cells for metastasis can be done by _____ assay.

[ ] Labelling Index
[ ] Cell Migration
[ ] Plating efficiency
[ ] Division Index

20) Cells can be estimated in solubilized cells by measuring the absorbance at 280nm, where _____ of protein equals $2X10^5$ cells

[ ] 1 ug [ ] 50 ug [ ] 100 ug [ ] 200 ug

SECTION "B"

[10 Q.× 1= 10 marks]

Fill in the blanks

1) A high concentration at freezing also allows sufficient _____ of the cryoprotectant at reseeding after thawing so that centrifugation is not necessary.

2) Human _____ is the first recombinant protein to be licensed as a therapeutic agent.

3) Addition of _____ at concentration of 0.25 ug/ml, to subconfluent cells helps to make feeder layers.

4) The end point of a MTT assay is usually an estimate of the number of _____ cells.

5) For Organotypic assay, inflammation response, can be detected by measuring _____ in the test solution.

6) In 2006 Nobel Prize in Medicine was given to Fire and Mello for the discovery of _____.

7) _____ established the first widely used chemically defined medium.

8) _____ can be used to sterilize heat-labile materials, such as plastics.

9) CMC stands for _____.

10) Senescence phenomenon is due to the inability of the terminal sequence of the DNA in the _____ to replicate at each cell division.

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SECTION "C"

[3 Q.× 8 = 24 marks]

Attempt any *THREE* questions.

1. What is a Primary Cell Culture? Discuss the ways of making Primary Culture? [1+7]

2. Why is quantitation of cells necessary? How can haemocytometer, Protein synthesis and Mitosis Index be used to quantitate the cells? [2+6]

3. Describe the different constituents found in medium used in cell culture? [8]

4. What is cloning of cell? How can we improve the clonal growth.. [1+7]

SECTION "D"

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

5. Why is serum necessary for sub culture? [5]

6. Explain the basic principles of cryopreservation. [5]

7. What is subculture? Compare the subculture method of mono layer and suspension cultures. [1+5]

8. Write the protocol for preparation of medium from powder using syringe? [5]

9. Explain different techniques used in measuring cytotoxicity? [5]

10. Discuss in detail any two essential equipment used in Cell culture. [5]

11. Write short notes on any *TWO*. [2×2.5=5]
    a) MTT assay
    b) Trypsin
    c) Multiwell Plates