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SARDAR PATEL UNIVERSITY
M Sc IV Semester Examination
Date: 07-04-2016 Day: Thursday
Time: 02.30 PM To 05.30 PM
Subject: BIOCHEMISTRY
Paper: PS04CBIC01 – Animal Biotechnology

Marks: 70

Q1. Select appropriate answer for the following. (8M)

(i) The signal for the differentiation of epidermal keratinocytes is received from

(a) Lymphocytes (b) Fibroblast (c) Melanocytes (d) Neuronal cells

(ii) Which of the following is **not** a DNA fluorochromes but is conventionally used for measuring DNA content?

(a) Haematoxylin (b) Hoechst 33258 (c) Propidium iodide (d) DAPI

(iii) Dilution cloning is based on the observation that the

(a) Cells grow best in diluted medium
(b) Cells get diluted below certain density to form discrete colonies
(c) Cells get more oxygen in diluted medium
(d) Cells can be induced to proliferate to reach to confluence very fast

(iv) The oldest and most commonly used cell line is

(a) HeLa (b) Jurkat (c) Vero cells (d) F11 cells

(v) Cells which have undergone transformation frequently become

(a) Anchorage independent (b) Anchorage dependent
(c) Stable (d) Density dependent

(vi) The most appropriate assay to measure irritability response in cultured cells is by

(a) Measuring level of growth hormone (b) Using tetrazolium salt assay
(c) Monitoring cytokine level (d) Measuring membrane polarity

(vii) The enzymatic marker for the characterization of endothelia is

(a) Creatine kinase (b) Tyrosinase
(c) DOPA decarboxylase (d) Angiotensin converting enzyme

(viii) The platting efficiency of cells can be checked during

(a) Lag phase (b) Log phase
(c) Plateau phase (d) All the three growth phases

(PTO)

Q2. Answer briefly any Seven from the following. 14M

(i) List out various microscopes required in cell culture laboratory. Write their principles.
(ii) Name the cell properties undergoing change when a cell is transformed.
(iii) Define transgenic animals. Give four examples of transgenic animals.
(iv) Why cryopreservation is required for cultured cells? Name the cryoprotectants and write their role in cryopreservation .
(v) How the replacement of serum can be substituted in serum free media?
(vi) Write the organization and importance of focal adhesion for cultured cells.
(vii) Name different growth factors involved in maintaining stem cells. Write their role.
(viii) Explain the regulation of cell cycle when the cells are cultured in media with serum and without serum.
(ix) Explain the relationship between cell concentration and cell density in sigmoid growth behavior of cultured cell.

Q3. **(a)** Write the composition of serum and discuss the advantages as well as disadvantages of using serum in animal cell culture media. (6M)

(b) Give the details of cell – cell adhesion as well as cell-matrix adhesion established in simple epithelia. (6M)

OR

(b) Which are the cells involved in synthesis and maintenance of extracellular matrix? Describe the culture protocol for these cells and write the major applications of these cell lines. (6M)

Q4. (a) Describe the development of primary cell line from human biopsy material. (6M)

(b) Give an account on different methods used for isolation of clones from monolayer culture as well as from suspension culture. (6M)

OR

(b) Discuss various methods employed to study apoptosis. (6M)

Q5. (a) Define embryonic stem cells and adult stem cells with examples; and describe their therapeutic applications. (6M)

(b) Why the characterization of cell line is necessary? Name different techniques used for characterization and describe any two of these techniques in detail. (6M)

OR

(b) Which parameters control differentiation of cells in cell lines? Discuss in detail. (6M)

Q6. (a) Write a note on different types of assays used for cytotoxicity testing of drugs employing cell lines. (6M)

(b)Describe the cell purification techniques based on following principles. (6M)

(i) Cell size and sedimentation velocity
(ii) Fluorescence activated cell sorting

OR

(b) Write the organizations of microfilaments as well as microfilament associated motor protein and explain their role in cell migration during cell culture. (6M)

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