



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

**SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELLOR OF
SCIENCE (BIOTECHNOLOGY)**

SBC 424: ANIMAL BIOTECHNOLOGY

DATE: Friday 30th March 2012

TIME: 2.00p.m – 4.00p.m

INSTRUCTIONS

Section A : Answer all questions, each 1 mark

1. The cultivation of animal tissues in vitro is called;
 - a) Secondary culture
 - b) Cell culture
 - c) Organ culture
 - d) Primary culture
2. A culture of cells arising directly from differentiated tissues is referred to as;
 - a) Primary culture
 - b) Cell line
 - c) Secondary culture
 - d) Continuous culture
3. The cells that multiply best in culture are called;
 - a) Lymphocytes
 - b) Macrophages
 - c) Fibroblasts
 - d) Trophoblasts

4. Proteins and other plasma therapeutic preparations derived from cells are called;
- a) Plasminogens
 - b) Biologics
 - c) Insulins
 - d) DNA probes
5. Mononuclear cells can be released from soft tissues by;
- a) Enzymatic digestion
 - b) Fragmentation
 - c) Dissociation
 - d) Isotonic solution
6. Aside from temperature, the most commonly varied factors in culture systems are the;
- a) Gas and EDTA
 - b) CO₂ and Water
 - c) Gas mixture and growth medium
 - d) Nutrient and EDTA
7. Selective growth medium used to produce monoclonal antibodies is called;
- a) Hybridoma medium
 - b) Culture medium
 - c) HAT medium
 - d) Monocultur medium
8. Gene therapy can be used at two different levels called:
- a) Embryo and patient therapy
 - b) Ex-vivo and In-Vitro therapy
 - c) Augmentation and Insertion therapy
 - d) Gene targeting and augmentation
9. Human growth hormone (hGH) is a protein made naturally by the;
- a) Hypothalamus
 - b) Pituitary gland
 - c) Spleen

- d) Liver
10. The modification process of germ cells by a gene manipulation in vitro is called;
- a) Gene therapy
 - b) Transgenesis
 - c) Embryogenesis
 - d) Microinjection
11. Two methods of introducing exogenous DNA into mammalian cells are;
- a) Electroporation and Viral vector
 - b) Microinjection and Augmentation
 - c) Electroporation and injection
 - d) Electroporation and Plasmid
12. For cloning in animal cells, fragments of DNA can be phagocytosed by means of;
- a) Phagocyte precipitation
 - b) Microprecipitation
 - c) Calcium phosphate coprecipitation
 - d) Immunocytosis
13. A range of proteins with therapeutic potential produced in cultured recombinant mammalian cells are secreted as;
- a) glycolipoproteins
 - b) glycoproteins
 - c) lipoproteins
 - d) peptides
14. A procedure for introducing unpackaged DNA into animal cells in culture is called;
- a) bacteriophage
 - b) vector
 - c) transfection
 - d) plasmid

15. Fusion of cell in culture for monoclonal antibody production can be promoted by;
- a) Hypoxanthine
 - b) Thymidine
 - c) Aminopterin
 - d) Polyethylene glycol
16. In livestock production, the goal of transgenesis is to;
- a) Introduce desired traits
 - b) Introduce vaccines
 - c) Identify commercial traits
 - d) Introduce growth hormones
17. Gene targeting begins when a target vector containing the desired mutation is introduced into;
- a) Stem cells
 - b) Target cell lines
 - c) Embryo derived stem cells
 - d) Blastocytes
18. Baculovirus vectors are available for use with culture:
- a) Mammalian cells
 - b) Continuous cell lines
 - c) Secondary cultures
 - d) Insect cells
19. Monoclonal antibodies are produced from a;
- a) Multiple immune B cell line
 - b) Lymph nodes
 - c) Single immune B cell line
 - d) Immune T lymphocytes
20. To develop novel vaccines, extensively used vectors are;
- a) Baculovirus
 - b) Vaccinia

- c) Retrovirus
- d) Adenovirus

Section B: Answer all six questions; (30 marks)

1. The cell culture of primary culture can be detached from the culture vessel by
 ===== and ===== These cells can be used to initiate
 ===== by reseeding them in fresh media at
 ===== (4 marks).

2. Four functions of a balanced salt solution as a basic component of media for mammalian cell culture are to provide:

- a.=====
- b.=====
- c.=====
- d.=====

(4marks)

3. Name 4 criteria the medium for mammalian cell culture must fulfill for it to be satisfactory.

- a.=====
- b.=====
- c.=====
- d.===== (4marks)

4. List the 4 quality control tests carried out on serum for use in mammalian cell culture

- 1.===== 2.=====
- 3.===== 4.=====

(4 marks)

5. a) In hybridoma technology for monoclonal antibody production, the selective medium used is a mixture of:

1. ===== 2=====, 3=====

(3marks)

b) With one example each, state 4 applications of monoclonal antibodies

Application	Example

(8marks)

6. In gene therapy, list 3 methods of introducing exogenous DNA into mammalian cells

1.=====

2.=====

3.=====

(3marks)

Section C: Answer Two Questions, each 10 marks

1. Discuss problems associated with large scale mammalian cell culture.

2. Discuss the basic principles of cloning in animal cells.

3. With vaccinia as example, discuss the role of viral vectors in the production of therapeutics and vaccines in recombinant mammalian cells