(*University of Choice*)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

(MAIN CAMPUS)
UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR

MAIN EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL BIOTECHNOLOGY

COURSE CODE: BMB 326

COURSE TITLE: TISSUE ENGINEERING & EMBRYOTECHNOLOGY

DATE: 23RD MAY 2019 **TIME: 8.00 -10.00 AM**

INSTRUCTIONS TO CANDIDATES

This paper is divided into three sections, A B and C respectively: Multiple Choice Questions (MCQs), Short Answer Questions (SAQs) and Long Answer Questions (LAQs).

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

SECTION A (20 MARKS) ANSWER ALL QUESTIONS

1. Name the type of culture which is prepared by inoculating directly from the tissue of an organism to culture media?

    a) Primary cell culture
    b) Secondary cell culture
    c) Cell lines
    d) Transformed cell culture

2. What is a cell line?

    a) Multilayer culture
    b) Transformed cells
    c) Multiple growth of cells
    d) Sub culturing of primary culture

3. Which of the following is the characteristics of a normal cell?

    a) Anchorage independent
    b) Continuous cell lines
    c) Dependent on external growth factor
    d) No contact inhibition

4. Which of the following statement is INCORRECT for gene knockout?

    a) Nonfunctional gene is introduced
    b) Make gene inoperative
    c) Introduction of functional gene in an organism
    d) It can be used to study the effect of loss of gene

5. Name the phenomenon where a single cell is able to reproduce the whole organism?

    a) Transfection
    b) Gene knocking
    c) Transgenesis
    d) Animal cloning

6. Which cloning technique is used to clone the whole organism?

    a) DNA cloning
    b) Reproductive cloning
    c) Gene cloning
    d) Therapeutic cloning

7. The process which begins after the fertilization is known as _____

    a) Cleavage
    b) Spermiogenesis
    c) Organogenesis
    d) Embryogenesis

8. Which of the following technique is used in disaggregation of Explants in tissue culture.

    A. Primary explant technique
    B. Mechanical disaggregation technique
    C. Enzymatic disaggregation technique
    D. All of the above

9. Which of the following culture is used for the production of primary and secondary metabolites?

    a) Cell suspension culture
    b) Callus culture
    c) Protoplast culture
    d) Somatic hybrid

10. Hybrid antibodies are:

    a) Abs designed using rDNA technology
    b) Abs produced in vivo
    c) Abs in cell culture
    d) Both A and B

11. What is the role of stem cells with regard to the function of adult tissues and organs?

    a) Stem cells are undifferentiated cells that divide asymmetrically, giving rise to one daughter that remains a stem cell and one daughter that will differentiate to replace damaged and worn out cells in the adult tissue or organ.
    b) Stem cells are embryonic cells that persist in the adult, and can give rise to all of the cell types in the body.
    c) Stem cells are determined cells that reside in fully differentiated tissues and can, when needed, differentiate to supply new cells for growth of the tissue.
    d) Stem cells are differentiated cells that have yet to express the genes and proteins characteristic of their differentiated state, and do so when needed for repair of tissues and organs.

12. Which of the following cells would be considered differentiated?

    a) Blastomere
    b) Spemann organizer
    c) Myotome of the somite
    d) Muscle cell

13. Tissue engineering increases the risk of fatality of the experimental animals.

    a) True
    b) False

14. Tissue culture experiments have to be conducted in extremely aseptic conditions. Therefore all things used in tissue culture programme must be properly sterilized before use with the exception of:

    a) The culture vessel
    b) The nutrient medium
    c) The various instruments used
    d) The explant

15. In humans, the babies produced by in vitro fertilization and embryo transfer was popularly called as:

    A. Test tube babies
    B. Invitro-invivo babies
    C. Invitro babies
    D. All of the above

16. At what point do 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
    b) 2 & 3
    c) 1 & 3
    d) All of the above

17. Hybridoma cells have an application to produce:
    a) Antigens
    b) Antibodies
    c) Cancer cells
    d) Cell lines

18. The poor antigen in a conjugate vaccine is:
    a) Strong protein
    b) Weak protein
    c) A Polysaccharide
    d) Non-polysaccharide

19. The success of using SCNT to create a cloned offspring was shown by the following experiment:

    a) A nucleus was taken from a cell of the udder of a white sheep.
    b) It was fused with an enucleated oocyte from a sheep with a black face and legs.
    c) The oocyte with its new nuclear genetic material divided to form an early embryo.
    d) The embryo was implanted in a surrogate mother sheep that had a black face and legs.

20. Which statement defines cloning?

    a) Making offspring identical to one parent
    b) Producing identical plants and animals by natural or artificial means
    c) Producing genetically identical copies of an individual, cell or gene
    d) Splitting embryos to make twins

SECTION B (40 MARKS) ANSWER ALL QUESTIONS

1. Briefly explain methods of removing adherent cells during cell passaging and state the weaknesses of each method. (8 Mks)

2. A. Briefly explain how primary cell cultures are established in a laboratory set-up. (4 Mks)

   B. Distinguish between monolayer and suspension cultures. (4 Mks)

3. Briefly makes short notes on properties of tumor cells. (8 Mks)

4. Outline FOUR advances of stem cell research and promises of its applications in biomedical practice. (8 Mks)

5. Briefly outline FOUR therapeutic and diagnosis application of monoclonal antibodies. (8 Mks)

SECTION B (40 MARKS) ANSWER ANY TWO QUESTIONS IN THIS SECTION

6. Write an essay on in vitro fertilization and Embryotechnology. (20 Mks)
7. A) Discuss the roles of Animal cell/Tissue culture and engineering in medical biotechnology (20 Mks)
8. Discuss hybridoma technique and its application in the production of monoclonal antibodies. (20 Mks)