Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2023/2024

COURSE NAME	:	CELL AND TISSUE ENGINEERING TECHNOLOGY
COURSE CODE	:	DAK 20903
PROGRAMME CODE	:	DAK
EXAMINATION DATE	:	JANUARY/ FEBRUARY 2024
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTIONS	:	1. ANSWER **ALL** QUESTIONS
		2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**
		3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

Q1 (a) (i) Explain the role of turgor pressure and cell wall as a plant support system.
(4 marks)

(ii) State the function of the lysosome in a cell.
(2 marks)

(b) (i) Define stem cell
(2 marks)

(ii) Differentiate between pluripotent and multipotent stem cells
(4 marks)

(iii) Discuss the potential impact of stem cell research on the future of medicine
(5 marks)

(iv) Discuss the ethical implications of using stem cells in research and therapy.
(4 marks)

(c) A doctor is treating a patient with cancer. She is considering using cryopreservation to preserve the patient's sperm before he undergoes chemotherapy. Evaluate the risks and benefits of this option.
(4 marks)

Q2 (a) State four (4) physical and chemical factors that affect microbial growth
(4 marks)

(b) (i) Sketch microbial cell growth curve.
(4 marks)

(ii) Describe the microbial cell growth curve.
(4 marks)

(c) (i) Describe the specific techniques or procedures that can be used to prevent contamination during the subculturing of microbial cultures
(4 marks)

(ii) State the function of the autoclave
(1 marks)

(d) Compare four (4) methods used for cell quantification
(8 marks)

Q3 (a) State the process of DNA replication in detail.

(6 marks)

(b) Explain how errors in DNA replication can lead to mutations.

(6 marks)

(c) Describe the process of DNA recombinant.

(6 marks)

(d) (i) Explain the concept of seed hybridization

(3 marks)

(ii) Analyse the drawbacks of using hybrid seeds in agriculture

(2 marks)

(iii) Explain why farmers often choose to use hybrid seeds despite these drawbacks

(2 marks)

Q4 (a) Explain the principles of gel electrophoresis and how it separates DNA fragments based on size.

(6 marks)

(b) Compare three (3) main differences between cancer cells and normal cells.

(6 marks)

(c) (i) Explain thalassemia

(2 marks)

(ii) Describe and sketch how a child inherits the thalassemia disorder from their parent.

(6 marks)

(iii) Discuss the role of education and awareness campaigns play in reducing the prevalence of thalassemia

(2 marks)

(iv) Discuss three (3) ethical implications of genetic engineering.

(3 marks)

-END OF QUESTIONS -