Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2014/2015

COURSE NAME	:	CELL AND TISSUE ENGINEERING TECHNOLOGY
COURSE CODE	:	BNN 30104
PROGRAMME	:	2 BNN
EXAMINATION DATE	:	JUNE 2015 / JULY 2015
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FOUR (4)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) Briefly explain the function of a nuclear envelope.

(4 marks)

(b) Triple Sugar Iron (TSI) medium is a differential medium that can distinguish between a number of Gram-negative enteric bacteria based on their physiological ability.

(i) List the basic ingredient for TSI.

(2 marks)

(ii) Briefly outline their function for each TSI's ingredient.

(3 marks)

(iii) Summarize the interpretation for TSI results.

(5 marks)

(c) Prokaryotic cells are one of the most primative organisms and they are found in bacteria and arachaebacteria while eukaryotic cells are found in the 3 main kingdoms: animal, plant, fungi.

(i) Differentiate between prokaryote and eukaryote cell based on above statement.

(9 marks)

(ii) Give **ONE (1)** example each for prokaryote and eukaryote.

(2 marks)

Q2 (a) Illustrate the common procedure for making a primary culture.

(8 marks)

(b) Explain the apoptosis in secondary cell cultures.

(4 marks)

(c) Summarize the continuous cultures for cell cultured in vitro.

(7 marks)

(d) Evaluate the choice of cell culture medium.

(6 marks)

Q3 (a) Briefly explain the term below:

(i) Generation time

(ii) Lag phase

(iii) Log phase

(3 marks)

(b) Identify the possible reasons for cell entry into a stationary phase.

(4 marks)

(c) Continuous culture devices (chemostats) are means of maintaining cell populations in exponential growth for long periods. Sketch the chemostats that control growth rate and growth yield in batch culture.

(10 marks)

(d) Differentiate between the different types of batch culture and continuous culture.

(8 marks)

Q4 (a) A vector is a DNA molecule used as a vehicle to artificially carry foreign genetic material into another cell, where it can be replicated and/or expressed. List **SIX (6)** examples of vector in cloning technology.

(6 marks)

(b) Give **SIX (6)** examples of genetically engineered foods that have been approved for commercial use.

(3 marks)

(c) Give the important role of plasmid DNA in cloning technology.

(2 marks)

(d) Interpret the indication below that involved in selection of recombinant bacteria.

(i) blue colonies

(ii) white colonies

(4 marks)

(e) Outline the purpose of restriction enzymes.

(4 marks)

(f) Identify the practical features of good DNA cloning vectors.

(6 marks)

Q5 (a) Sketch the flow diagram of the genes to processes in biotherapeutics industry.

(6 marks)

(b) Biotherapeutics are an integral and valuable tool for modern medicine to treat and prevent serious illnesses and diseases.

(i) List **FOUR (4)** examples of biotherapeutics

(ii) Relate the important of biotherapeutics for each example given.

(8 marks)

(c) Summarize the biological and conventional drugs used in therapeutic industry.

(5 marks)

(d) Identify the main issue in risk management for animal tissues.

(6 marks)

Q6 (a) There are a few method used to determine number of living cells, which can grow in an optimum condition for the particular bacteria. The pour plate method is actually one of the method to dilute bacterial culture.

(i) Skecth the diagram of the flow pour plate method for bacteria enumeration.

(7 marks)

(ii) List **FOUR (4)** factors that affect the accuracy of a viable plate count.

(4 marks)

(b) In samples with very high bacterial concentrations, experimentations are often unable to get accurate count and report the results as "too numerous to count" (TNTC).

(i) Give a significant amount due to the TNTC.

(1 marks)

(ii) List **THREE (3)** examples of automated way to count bacteria in a liquid culture.

(3 marks)

(c) Explain the purpose of loop is heated in between the sector of quadrants during streak plate technique.

(2 marks)

(d) Sketch a diagram for each streak plate method:

(i) Three Sector Streak (T streak).

(ii) Four Quadrant Streak.

(4 marks)

(e) Explain the function of negative staining in determining the microbial specimens using microscope.

(4 marks)

- END OF QUESTION -