FACULTY OF SCIENCE

DEPARTMENT OF BIOTECHNOLOGY (DFC)
MODULE: BTN2BPT PROCESS TECHNLOGY AND MANAGEMENT
(DIPLOMA BIOTECHNOLOGY*)*
CAMPUS: **DFC**
NOVEMBER FINAL EXAMINATION

DATE: NOVEMBER 2014   **SESSION 1 (08h30)**

ASSESSOR(S)   **Mr E van Zyl**

EXTERNAL MODERATOR   **Mr K Maclean**

DURATION   2 HOURS   **MARKS   130**

SURNAME AND INITIALS: _____

STUDENT NUMBER: _____**CONTACT NUMBER:** _____

NUMBER OF PAGES:
INSTRUCTIONS:
1   ANSWER ALL QUESTIONS
2   ANSWER **SECTION A** ON THE UJ MULTIPLE CHOICE ANSWER SHEET
PROVIDED (**DO NOT USE RED INK**). THERE IS ONLY ONE CORRECT
ANSWER FOR EACH QUESTION.
3   MAKE SURE THAT YOUR NAME OR STUDENT NUMBER IS CLEARLY
WRITTEN ON THE UJ **MULTIPLE CHOICE ANSWER SHEET** AS WELL
AS ON YOUR **EXAMINATION ANSWER SCRIPT** AND **QUESTION PAPER**
4   HAND THE **UJ MULTIPLE CHOICE ANSWER SHEET** IN TOGETHER
WITH YOUR **EXAMINATION ANSWER SCRIPT** AS WELL AS YOUR
QUESTION PAPER

REQUIREMENTS: 1
1   UJ MULTIPLE CHOICE ANSWER SHEET
2   EXAMINATION ANSWER SCRIPT

SECTION A (Answer on MCQ Card)   (Not available)

SECTION B

<u>QUESTION 1</u> (Answer this question in your UJ Examination Answer Script)

Describe the "Functional Organization Structure" of Management **[8]**

<u>QUESTION 2</u> (Answer this question in your UJ Examination Answer Script)

Discus Customer Service as a Quality value **[12]**

<u>QUESTION 3</u> (Answer this question in your UJ Examination Answer Script)

The batch of meat pies contains 45% steak pies, 15% beef & onion pies, and 40% sausage rolls. If a sample of one is taken, what is the probability that:

3.1	the sample is a sausage roll?	(2)
3.2	the sample is a steak pie or a sausage roll?	(2)
3.3	the sample is a beef and onion pie or a sausage roll?	(2)
3.4	the sample is a beef and onion pie or a sausage roll or a steak pie?	(2)

A large batch of meat pies is tested for contamination with *Staphylococcus.*
If 7% of the batch is contaminated and a sample of two is taken, what is the probability that:

3.5	The first sample is defective?	(2)
3.6	The second sample is defective?	(2)
3.7	Both samples are defective?	(2)
		[14]

Discuss the rules of communication   **[20]**

QUESTION 5 (Answer on your Question Paper)

Complete the following:

In Mass Transfer, species move with respect to each other owing to their
5.1 ……………………………………. The rate of movement is restricted by
5.2 ………………………………….
The situation where the driving forces have disappeared is called
5.3 ………………………………….
The friction approach to interactions between the species allows any number of components to be handled in a consistent manner for example: (any Two)
5.4 ……………………………………., and **5.5** ………………………………………….
In mass transfer there are two laws. They are: The flux of a species is proportional to
5.6 …………………………………. and the flux is also proportional to
5.7 ………………………………….
Conventional mass transfer in a binary mixture of gases is simple. If pressure and temperature remains constant, the
5.8 …………………………………. is also constant.
By definition the sum of the fluxes with respect to the mixture is
5.9 ………………………………….
Writing down the flux equations for the two components shows that there is (how many)
5.10 …………………………………. binary diffusion coefficient/s. This diffusivity is a constant independent of composition, but not of
5.11 …………………………………. and **5.12** ………………………………….
                                                                      [12]

QUESTION 6 (Answer on your Question Paper)

With regards to the resistance of fluids to flow (see diagram inserted), complete the missing words on your question paper:

The presence of cells, substrates, products and air affects the
8.1 …………………………………. of fermentation fluids which in turn has a marked effect on mass transfer, heat transfer, mixing, aeration and
8.2 …………………………………. of fluids.
This in turn has a major influence on bioprocess design and
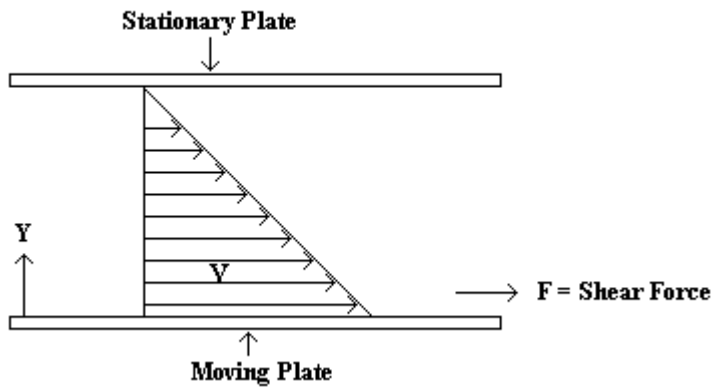**8.3** ………………………………….
Viscosity is the important aspect of rheology, the science of
8.4 ………………………………….
Viscosity is determined by relating the velocity gradient in fluids to the
8.5 ………………………………….causing flow to occur.

Velocity Profile for Couette Flow between parallel Plates

Considering the development of laminar flow between parallel plates. (Fig above)
The lower plate is moved to the right with shear force (F), while the upper plate remains fixed. A thin film of fluid
8.6 …………………………………….. to the surface of each plate.
Therefore as the lower plate moves, fluid
8.7 …………………………………….while at the surface of the stationary plate the fluid velocity is
8.8 ……………………………………..
Due to viscous drag, fluid just above the moving plate is
8.9 …………………………………….; however, as we get closer to the top plate, the fluid is affected by viscous drag from the stationary film attached to the upper plate surface. As a result the velocity between the plates
8.10 …………………………………….from that of the moving plate.
Laminar flow due to moving surface is called
8.11 …………………………………….. flow which results in the slope of the line connecting the arrows to be constant and proportional to the
8.12 ……………………………………., responsible for the flow.

[14]

TOTAL 130