CATHOLIC UNIVERSITY INSTITUTE OF BU

2019/2020 ACADEMIC YEAR

First Semester Examinations – February 2020

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES

School		**Course Title**	**General Biochemistry and Microbiology**		
Course Code	**AFC 105**				
		Credit Value	**4**		
Status	**C**			**Time**	**11:30-2:30**
Date	**07/03/2020**	**Venue**	**LH 1**		
Course Master(s)		**Dr NGANGOUM ERIC S.**			

Duration: 3h

Instruction: Answer all questions

Exercise I (12 marks)

1) Define the following terms: Aldopentose, Chiral Carbone, Essential fatty acid, Iodine value, Nucleoside (1 x5marks).
2) **Biomolecules are polymers made up of monomeric building blocks. Make a combination** such as (7: C), to match the monomers used to synthesize these naturally occurring polymers **(2.5marks).**

Polymers	Monomers
1- DNA and RNA	a- Glucose
2- Proteins	b- Nucleotides
3- Cellulose	c- Amino Acids
4- Starch	d- Lipids
5- Membranes	e- Vitamins

3) **What are the constituents of nucleotide? (0.5 x 3marks)**
4) **Draw a table giving the difference between RNA and DNA (1.5marks)**
5) **State the types of RNA (0.5 x 3marks).** mRNA, tRNA, rRNA

Exercise II (20marks)

1) The multiplication of viruses, both DNA and RNA containing viruses, is divided into six phases name them **(0.5 x 6 marks)** recognition, attachment penetration, biosynthesis, maturation & release
2) Give the different mode of viruses' transmission with one example in each case **(0.5 x**

By air Corona
By blood HIV
By water cholera

3) What is bacteriophage? **(0.75 mark)** virus that attack bacteria

4) Talking fungi, how many sexual spores do you know? List them **(0.5 x 4 marks)** zygospore, Ascospore, basidiospore, sporangiospore

5) What is as Fungi imperfecti? **(0.75 mark)** fungi which do not have sexual spore

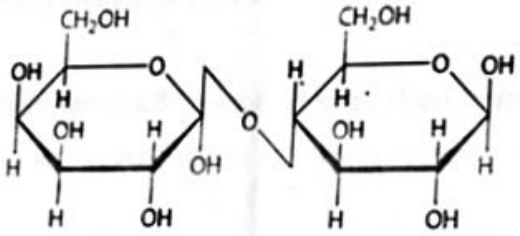
6) What is the mode of bacterial reproduction? Give the schema diagram showing the five steps of binary fission of the bacteria **(1+ 0.5 x 5 marks)**

7) Give the classification of bacteria on the basis of flagella, also give the structure of the different types **(1 x 5 marks)** Atrichous, monotrichous, lophotrichous, Amphitrichous, peritrichous

8) What are the major groups of microorganisms? **(0.5 x 5marks)** Protozoa, algae, bacteria, virus, fungi

Exercise III (14marks)

1) Examine the following Haworth projection of sugar **A** to answer the questions below.



A

a. What are the common name and the biochemical name of sugar A? **(2marks)**

b. What are anomeric sugars? **(1mark)**

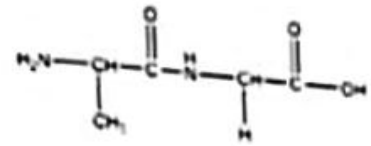
c. Label anomeric carbons by circling them. Is **A**, a reducing sugar? Why? **(2marks)** Yes because of free fundamental OH group

d. Classify the glycosidic bonds using the alpha or beta-(#, #) format. **(1pt)** β-1,4 glycosidic bond

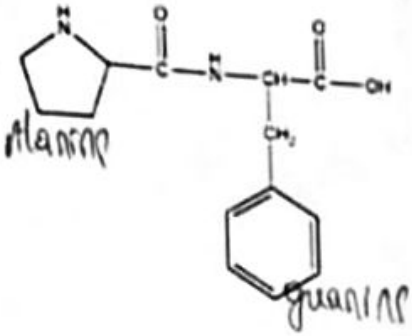
e. If the glycosidic bond is hydrolyzed, what are the names of the monosaccharides produced. Remember to include the alpha or beta classification for the anomeric carbon. **(2marks)** beta glucose

2) Draw and give the full names of the amino acids in the following dipeptides **(6marks).**

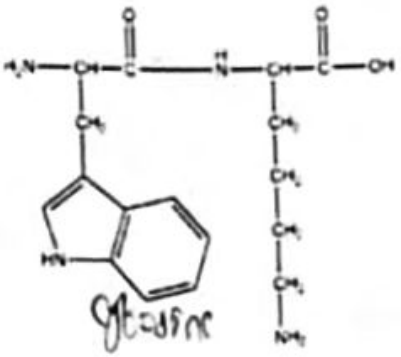
a.



b.



c.



3) How many peptides can be formed from threonine (Thr), alanine (Ala), and phenylalanine (Phe)? List them using three character abbreviations for each amino acid. **(4marks).** 6 peptides namely ;

i) Thr Ala Phe
ii) Thr Phe Ala
iii) Phe Ala Thr
iv) Phe Thr Ala
v) Ala Phe Thr
vi) Ala Thr Phe