FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2021/2022 SESSION
COURSE TITLE : GENERAL MICROBIOLOGY I
COURSE CODE : MCB211 UNITS : 2 UNITS

INSTRUCTION : Answer ALL Questions. Time allowed: 1 Hour

1. Cell division in eukaryotic cells is usually by ……while in prokaryotic cells, it is usually by ……
2. The most striking difference between a prokaryotic cell and a eukaryotic cell is …….
3. An example of a prokaryotic cell is ……while……is an example of a eukaryotic cell.
4. A prokaryote is a simple, single-celled organism that ……
5. The……. of bacteria is made up of peptidoglycan.
6. …… of prokaryotes is semi-permeable in nature.
7. ……holds all the cell organelles such as nucleoid, ribosome, plasmid, and others in their place.
8. The genetic material of prokaryotes is located more or less centrally in the irregularly-shaped region called……
9. Plasmid carries out the function of……
10. The major function of the ribosome is to …….
11. ……. is a small irregularly shaped organelles which consists of ribosomes.
12. Fimbria helps …….
13. Round shaped bacteria are called ……while rod shaped ones are called…….
14. ……are the developed, advanced and complex forms of cells.

15. Like a prokaryotic cell, a eukaryotic cell has ……and……

16. …… …….. houses the cell's DNA

17. ……. mostly reproduce through binary fission, but some types of bacteria exchange their genetic information in a process called……

18. The first step of binary fission is …….

19. During asexual reproduction, the micronuclei undergo …… in eukaryotes.

20. ……are the most important decomposers of structural plant compounds

21. The first microbiologist to work in 1677 was ----------

22. The small pox vaccine was discovered by ----------

23. The disprove of spontaneous generation was effected by ----------

24. ---------- practiced antiseptic surgery.

25. The first rule of germ theory of disease was discovered by ----------

26. The first Microbiologist to grow bacteria in a solid media is called ----------

27. What year was acid fast stain developed? ----------

28. Gram stain was developed by ----------

29. Louis Pasteur developed the first rabies vaccine in the year ----------

30. In the 19th century, what carried the yellow fever agent? ----------

31. Syphilis was discovered in ----------

32. DNA sequencing was developed in ----------

33. The process of generating new offspring is called ----------

34. Bacteria undergoes ---------- reproduction

35. Asexual reproduction only produces ---------- organisms

36. Genetic recombination is ----------

37. What is the full meaning of PCR? ----------

38. PCR was discovered by ----------

39. What is the full meaning of DNA? ----------

40. Prokaryotes undergoes ---------- reproduction

41. ---------- refers to the genetically driven changes that occur in microorganisms and are retained over time.

42. Some microbial changes can be in response to a ----------

43. Microbial changes are often due to a change in the sequences of the ----------

44. Horizontal gene transfer can occur between bacteria and even between ---------- that are not related to one another.

45. Darwinian evolution takes place over ---------- of years.

46. Microbial evolution can occur within ----------

47. Bacteria are capable of growing and dividing in ---------- minutes under ideal growth conditions

48. A third genetic mechanism of bacterial evolution involves ----------

49. Coliphages infect various strains of ----------

50. ---------- is a change in the arrangement of nucleotides that makes up a gene

51. ---------- is the orderly arrangement of organisms into groups, preferably in a format, that shows evolutionary relationships.

52. Currently, living organisms are divided into three, which are ----------

53. Archaea are not sensitive to some ---------- that affect the Bacteria

54. Cell walls of Archaea does not have ----------

55. According to scientific nomenclature, each bacterium is assigned ---------- names

56. The genus name is always ----------

57. Intuitive is one of the method of ---------- bacteria

58. *Escherichia coli* is named after which Scientist? ----------

59. *Blastomyces brasiliensis* is named after which geographical place? ----------

60. Names of all taxa are printed in ----------

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION, 2021/2022 SESSION

COURSE TITLE: MICROBIAL ECOLOGY (MCB313) **UNIT:3 UNITS**

INSTRUCTIONS: Answer **FIVE** questions in **All; AT LEAST TWO** questions from each Section.

Time Allowed: 2hrs 30mins

SECTION A

1. Highlight the relevance of microbial ecology.
2. Matter is recycled through the Earth's ecosystem. Discuss.
3. Write a short note on the following:

i. Biomes

ii. Community

iii. Bio-concentration

SECTION B

4a. What is biological interaction?

4b. Describe the following symbiotic relationships

(i) Lichen

(ii) Mycorrhizae

(iii) *Chlorella vulgaris* and other algae

(iv) Remoras and Shark

(v) Lactic acid bacteria and vagina epithelium

5a. What is Biodegradation?

5b. List and explain the three processes of biodegradation

6. With the aid of a diagram, briefly explain how Carbon is recycled in nature.

7. Explain how the World's largest bacterium adapts in extreme environment.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER 2021/2022 SESSION EXAMINATION
COURSE TITLE: INDUSTRIAL MICROBIOLOGY
COURSE CODE: MCB 413 (3 UNITS)

Instruction: Answer 5 questions in all. Attempt 1 question only in section A and any 4 from section B. **Time allowed: 3 Hours**

Section A

1. (a) Describe industrial Microbiology and highlight the use of microorganisms by industry

(b) Discuss the scope and applications of Industrial Microbiology

2. (c) What is culturing in Microbiology?

(b) Discuss Batch versus Continuous Cultures and their specific applications

Section B

3. **(a)** (i) What is Vinification?
(ii) Mention the requirements for micro-organisms suitable for large scale production of pharmaceuticals and other chemicals
(b) Describe the method of producing high quality vinegar.
(c) With the aid of a flowchart describe the process of yoghurt production.

4. **(a)** (i) Define Antibiotics.
(ii) Enumerate the basic steps involved in cheese making.
(b) Describe the processes of malting, wort boiling, fermentation and lagering in brewing
(c) Sketch the flowchart of garri production.

5. **(a)** Explain the processes involved in bioterioration of materials.
(b) In a tabular form list five types of biodeteriorable materials and two organisms each involved in the action.

6. **(a)** What is strain improvement?
(b) Discuss strain improvement by mutation and protoplast fusion using *Aspergillus* sp

7. **(a)** Describe Recombinant DNA Technology
(b) Discuss the stages involved in mutant selection

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION,
2022/2023 ACADEMIC SESSION

COURSE TITLE: PRINCIPLES OF EPIDEMIOLOGY AND PUBLIC HEALTH

COURSE CODE: MCB414 **UNIT: 3 UNITS**

INSTRUCTIONS: Answer question 1 and any other four (4) questions

Time Allowed: 2hrs 30mins

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1. Define epidemiology and explain briefly the keywords in last's definition of epidemiology.

2a. Explain the two types of epidemics
2b. Outline six (6) importance of epidemiology to public health.
3. Discuss the steps involved in the investigation of an epidemic.

4. List five (5) zoonotic diseases, stating their etiological agents, host animal and major symptoms in humans.

5. Write short notes on the following:
i. Epidemic
ii. Endemic

iii. Prevalence
iv. Surveillance
v. Risk factor
vi. Morbidity
vii. Zoonoses

6a. Describe the chain of infection for cholera.
6b. Differentiate between Cohort and Case-Control Studies.
7a. The total population of women in Gidan Kwano community is 1600, 450 of this population were already infected with vulvovaginal candidiasis and 120 women were recently diagnosed of the same infection. Calculate the incidence rate per 100 population.
7b. Discuss the six intertwined factors involved in the causation of infectious disease.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY,

FIRST SEMESTER EXAMINATION 2021/2022 SESSION

MICROBIAL GENETICS AND MOLECULAR BIOLOGY (MCB 415) 3 UNITS

INSTRUCTIONS: Answer FIVE Questions in All; AT LEAST TWO Questions from each Section. Questions 1 from Section A is Compulsory.

Time Allowed: 3 Hours

SECTION A

1. You discovered that a species of bacteria can break down lactose products due to an enzyme it produces, lactases HY. You wish to study the gene that codes for this enzyme.

a) DNA Extraction

To begin work on the bacterium, you begin by extracting its genomic DNA (gDNA). What is the purpose of the following procedures?

i). Using **proteinase K** during extraction
ii). Adding RNase A during extraction
iii). Adding ethanol before recovering the DNA extract

b) Polymerase Chain Reaction

After purifying the gDNA extract, you want to isolate and amplify the lactases HY gene. You perform PCR using the appropriate gene-targeted primers. What is the purpose of the following PCR components?

i). DNA polymerase isolated from *Thermus aquaticus*
ii). Deoxynucleotide triphosphates (dNTPs)
iii). Forward and reverse primers

c) If you wish to identify the bacterial species in this scenario, what gene is most commonly and routinely sequenced?

2. **a**). DNA replication is bidirectional and discontinuous; explain your understanding of those concepts.

b). A mutation has occurred in the DNA and in the mRNA for a gene. Discuss which would have a more significant effect on gene expression and Why?

c). If the gene for helicase is mutated, what part of replication will be affected?

3. **a**. Explain in detail your understanding of '**Gene expression** with regards to the production of proteins for cellular functions'.

b. Define the following:

i. coding and template strand
ii. recognition sites of a DNA

SECTION B

4. a. How can you artificially stimulate a bacterium in the laboratory to take up DNA fragments from the environment?

b. Name each of the following:

(i). The process whereby the donor DNA replaces the recipient DNA specifically.

(ii) The mechanism of recombination in which the homologous region of the recipient DNA is replaced by donor DNA

5. Assume the following base sequence was found in a 20 base DNA strand:

3^1 ATT CGA CCT TAT TAC TGC AC 5^1

i. What would be the 10 bases in the 3^1 end of the complementary strand?

ii. What would be the 10 bases in the 5^1 end of the complementary strand?

6. Describe how sex is determined in bacteria.

7. Discuss the properties of plasmids.

FEDERAL UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION 2021/2022 ACADEMIC SESSION
MCB 416 – SOIL MICROBIOLOGY (3 CREDIT UNITS)

INSTRUCTION: ANSWER QUESTION (1) AND ANY OTHER FOUR (4) QUESTIONS. **TIME ALLOWED: 2hrs 30mins**

1) Describe how you would examine the microbial composition of rhizosphere soil?

2) Discuss 4 factors affecting distribution, activity, and population of soil microorganisms.

3a) What is the role of microorganisms in pedogenesis?

3b) List five (5) factors that influence soil formation?

4) Giving 2 examples each, explain the following ecological interaction

(i) commensalism, **(ii)** proto-cooperation **(iii)** ammensalism

(5) What roles do the following parameters play in soil microbiology?

(i) Soil microbial diversity,

(ii) soil microbial activities and

(iii) soil microbial biomass

6(a) Describe the relationship that exist between a soil fungus and plant root

6(b) List five (5) reasons for the use of microorganisms as indicators of soil health?

7(a) Soil is believed to be a living system, explain

7(b) Explain four (4) approaches available for studying biodegradation processes.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION QUESTIONS, 2021/2022 SESSION
COURSE TITLE: PATHOGENIC BACTERIOLOGY
COURSE CODE: MCB 511 (3 UNITS)

Instruction: Answer five (5) questions in all. At least one (1) question should be answered from each section

Time: **$2^1/_2$ Hours**

SECTION A

1a. List the general characteristics of members of Enterobacteriaceae

1b. How will you determine significant bacteriuria in a suspected case of urethritis?.

2. Describe the laboratory procedures for the following tests

i. Urease ii. Methyl red iii. H_2S production iv. Gas production from carbohydrates

v. Catalase

SECTION B

3. Discuss *Staphylococcus aureus* under the following headings: Virulence factors, Disease and laboratory diagnosis

4a. Give the detailed classification of Mycobacteria.

4b. Describe the pathogenesis, laboratory diagnosis and treatment of pulmonary tuberculosis.

5a. List the virulence factors associated with diseases caused by *Streptococcus pyogenes* b. Demonstrate how to prove *Streptococcus pyogenes* as the causative agent of a disease in the laboratory.

SECTION C

6a. Describe the different laboratory diagnosis for whooping cough.

6b. With the aid of a diagram, explain the life cycle of Chlamydia and highlight the distinct forms peculiar to only Chlamydia.

7. Use the following headings to discuss Malta fever: Causative agent; Cultural characteristics; Pathogenesis and clinical manifestations; Laboratory diagnosis; Treatment and control.

FEDERAL UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION 2021/2022 SESSION

Course: Fermentation Technology
Course Code: MCB 512 (3 UNITS)
Instruction: Answer 5 questions in all. Attempt all the questions in Section A and two (2) questions each in Sections B and C
Time allowed: 2 hours 30 minutes

Sction A

1. (i) Describe fermentation and outline its basic principles of fermentation

   (ii) Discuss three types of fermentation
   (iii) List any six limitations of fermentation
   (iv) How will you overcome too much salt, bad smell and changing colour in vegetable fermentation?

Section B

2 (a) Define Cell Disruption.
(b) Write short notes on:
(i) Distillation (ii) Rotary-drum vacuum filter
(iii) Primary treatment of effluent (iv) Affinity chromatography

3 (a) Define Chromatography
(b) Name the processes involved in physical method of cell disruption and discuss any two (2).
(c) How does decanter centrifuge work?

4 (a) Explain Solvent and Aqueous two-phase extractions
(b) Give five (5) points to consider for efficient recovery and purification of a product after fermentation.

Section C

5. Describe any five requirements needed to support the growth of microorganisms that must be put into consideration when formulating fermentation media

6 (a) If the maximum specific growth rate of a microbe growing on a particular substrate in a fermenter is 0.80 h^{-1} and the specific growth rate dictated by the dilution rate is 0.60 h^{-1}, calculate the substrate concentration at steady state and the flow rate if the volume of the reaction vessel is 2L and the substrate utilization constant is 20mgL^{-1}.

b. State six basic functions of a fermenter

7 (a) If the initial population of bacterial cells in a culture is 1,000 (10^3) and the generation time is 2hours, calculate the number of generations and the number of cells in the culture after 6, 24 and 48h?

(b). Describe one type each of submerged and surface fermenters that can be used in industrial fermentations.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION 2021/2022 ACADEMIC SESSION
MCB 513 - GENERAL TOXICOLOGY (3 CREDIT UNITS)
INSTRUCTION: ANSWER ANY FIVE QUESTIONS
TIME ALLOWED: 2½ Hours

1. Write short notes on any **two** of the followings:
   i. Factors that modulate the effects of toxicants
   ii. Mechanisms of transport of toxicants
   iii. Routes of penetration of toxicants in animals
2. Enumerate and discuss the steps required for effective management of an acutely poisoned victim.

3. a) Using flow chart **only,** highlight the fate and effects of toxicants in the body

   b) Write short note on *Clostridium botulinum* toxin and its mode of action.

4. a) Highlight the underlying factors that affect the toxicity of drugs in an individual

   b) Discuss carbon monoxide as air pollutant and its mechanism of poisoning in man

   c) Enumerate four classes of toxins in relation to their modes of action.

5. a) What are the effects of untreated tannery effluents discharged into the environment?
   b) Differentiate between bioaccumulation and biomagnification
6. Describe Four (4) ways through which microorganisms detoxify heavy metals

7. Describe Four (4) mechanisms of biosorption of toxicants

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER 2021/2022 SESSION EXAMINATION

COURSE TITLE: Analytical & Quality Control Microbiology
COURSE CODE : MCB 515 (2 UNITS)
Time allowed: 1 hour 15 Minutes
Instruction: Answer 4 questions in all and only two (2) questions from each section

Section A

5. (a) Discuss food quality standards

(b) Explain Food quality from the viewpoint of the food industry and the consumer

(c) What does a food standard constitute?

6. (a) Briefly explain proximate analysis in food quality control
(b) Highlight the mandates of National Agency for Food and Drug Administration Control and how they are achieved.
(c) List the functions of Standard Organization of Nigeria and how these mandates are fulfilled

7. (a) Discuss the "Food Code" and briefly explain how its responsibilities are carried out

(b) Outline the stages involved in the development of standards by International Organization for Standardization (ISO)

(c) **Site of collection** is a factor affecting microbiological test! Explain with good examples

Section B

8. Briefly discuss the significance of an effective equipment management policy

9. How will you ensure that the Microbiology Laboratory remains safe for all the users?

10. (a) Describe the principle and the technique of immunoelectrophoresis

(b) State three precautionary measures you will take during Gel electrophoresis.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY,
FIRST SEMESTER EXAMINATION 2021/2022 SESSION
COURSE TITLE: INTRODUCTION TO BIOTECHNOLOGY (MCB 516) 2 UNITS

INSTRUCTIONS: Answer **FOUR Questions** in All; **AT LEAST ONE Question** from each **Section**.
.**Time Allowed:** 2 Hours 30 minutes

SECTION A

1. a. Briefly explain downstream processing
   b. Compare and contrast downstream processing and analytical bio-separation
   c. List the factors that determine the mode of extraction of a fermentative product

2. a. Define Biotechnology
   b. Briefly highlight the contrasting features between coagulation and flocculation in downstream processing.
   c. What will necessitate the disruption of cell integrity in downstream processing?
   d, List four typical methods that will enable you achieve product polishing

SECTION B

3. Define enzyme immobilization.
   Highlight 5 advantages and disadvantages of enzyme immobilization

4. With the aid of diagrams, write briefly on the following
   (i) Encapsulation.
   (ii) Adsorption.
   (iii)Entrapment.

SECTION C

5. **a** Discuss cell culture technique and its' relevance to biotechnology
   b. Discuss why animal cell culture shows limited growth even if the best nutritive and physical conditions are maintained.
6. a. Explain the principle of micropropagation and how such procedure can be used to improve yam cultivation in Nigeria.
   b. Discuss CRISPR and Cas9 based systems with emphasis on potential application in biotechnology.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY,
FIRST SEMESTER EXAMINATION 2021/2022 SESSION

COURSE TITLE: ENTREPRENEURSHIP II

COURSE CODE: (MCB 517) 2 UNITS

Instruction: Answer **any THREE questions**. **Time Allowed: 1 hour 30 minutes**

1. Discuss the three major areas of entrepreneurship in Medical Microbiology.
2. Write an essay to convince your friend who is a graduate of Microbiology that Entrepreneurship in Medical Microbiology is profitable
3. (a) Describe the procedure of making yoghurt at home.

   (b) As an entrepreneur, what measures would you take to prevent microbial contamination of potable water factory?
4. Make a proposal to the Niger State government on how to make money from the abundant biodegradable solid wastes in the State.
5. Discuss the five phases employed in mushroom cultivation.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION
2021/2022 ACADEMIC SESSION

COURSE TITLE: GENERAL MICROBIOLOGY II

COURSE CODE: MCB 321 **UNIT: 3 UNITS**

INSTRUCTIONS: Answer any Five (5) questions in all. At least ONE question from each section.
Time Allowed: 2½ Hours

SECTION A

1. **(a)** Discuss the five major roles of soil in an ecosystem.
   (b) Write short notes on freshwater microflora.
2. **(a)** With the aid of diagram only, describe the cycle of infection.
   (b) Stating the specific causative agent, list five (5) common infectious disease caused by: **i.** Virus **ii.** Bacteria **iii.** Fungi **iv.** Parasite

3. **(a)** Distinguish between the two types of immune response
   (b) Write short notes on:
   i. Vaccine **ii**. Antibody **iii.** Infectious disease
   iv. Reservoir **v.** Pathogenicity

SECTION B

4. Describe symbiosis and the five (5) types of symbiotic relationships, giving specific examples.
5. **(a)** What is industrial fermentation?
   (b) Mention four (4) categories of fermentation
   (c) Describe the fermentation process of a named product in one of the category mentioned above.

SECTION C

6. **(a)** A bacterium with a fertility factor (F^+) can exchange genetic materials with another bacterium without a fertility factor (F^+). Discuss
   (b) Outline the steps involved in transduction.
7. **(a)** Write a detailed note on transformation.
   (b) Explain generalized and specialized transduction and the cycles involved.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION,
2021/2022 ACADEMIC SESSION

COURSE TITLE: MEDICAL MYCOLOGY

COURSE CODE: MCB322 **UNIT: 2 UNITS**

INSTRUCTIONS: Answer **ANY THREE** questions**;** **Time Allowed: 1hrs 30mins**

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1. **(a)** List the conditions that could predispose people to *Candida albicans* infections

(b) Describe the laboratory methods for differentiating *Candida albicans* from other yeasts that could be found in human specimen.

2. **(a)** State how you would identify the following fungi in microscopic preparations *Aspergillus flavus, Rhizopus stolonifera, Microsporum canis, Trichophyton rubrum* and *Histoplasma capsulatum*

(b) In a tabular form, state the parts of the body affected, clinical manifestation and causative agents of the following mycotic diseases: *Pythriasis versicolor*, *Tinea barbae*, *Tinea pedis*, Sporothricosis and cryptococcosis.

3. Discuss asexual reproduction in fungi and the various methods involved.

4. List the distinguishing features of the Zygomnycota and Ascomnycota. Draw and label a named example of each.

5. Based on their modes of nutrition, discuss the four categories of fungi. Give an example each.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION
2021/2022 ACADEMIC SESSION

COURSE TITLE: MICROBIAL PHYSIOLOGY AND METABOLISM
COURSE CODE: MCB 323 **UNIT: 3 UNITS**
INSTRUCTIONS: Answer any Five (5) questions in all. At least ONE question from each section.
Time Allowed: 2½ Hours

SECTION A

1. (a) Draw and label a prokaryotic cell.
(b) State the functions of any five (5) parts.
2. By means of a well labelled diagram, briefly explain generation of proton motive force (PMF) in prokaryotes.

SECTION B

3. Write short note on the following terms:
(i) Active transport **(ii)** Passive Transport **(iii)** Allosteric proteins.
4. Describe the process of:
(i) end product inhibition **(ii)** catabolite repression.

SECTION C

5. (a) Explain three (3) types of asexual and sexual reproduction in bacteria.
(b) What is generation time?
(c) Based on tolerance, explain how pH, oxygen and temperature affect microbial growth.

SECTION D

6. Growth of a bacterial colony on a solid medium involves many of the same features as bacteria growing in liquid, but it is marked by some important differences.
(a). Elucidate briefly what will happen to the colony at the edge and centre of the agar medium?
(b). At what growth phase are cells in locations between these two extremes?
(c). At what growth phase are cells in the center of the agar medium?
(d). How can you describe the type of growth experienced by cells at the edge of the colony?

7. **(a).** With the aid of a pictograph, discuss primary and secondary metabolism in respect to metabolite production.

(b). Highlight briefly the stages in endospore formation.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2021/2022 SESSION

COURSE TITLE/CODE: VIROLOGY/MCB521 **UNIT: 3 UNITS**

INSTRUCTIONS: Answer **FIVE** questions in **All;**

Time Allowed: 2hrs 30mins

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6. **(a)** Discuss the origin of viruses.

(b) Based on the nucleic acid content, describe the process of protein synthesis in the following groups of viruses;

i. DNA virus

ii. RNA virus

iii. Retrovirus

7. **(a)** "Lysogeny is a less deadly form of parasitism than the full lytic cycle" Discuss.
(b) Explain the medical importance of viruses.

8. **(a)** what could be the genetic reason(s) why someone that was exposed to high dose of Human Immunodeficiency Virus (HIV) on several occasion did not contact the infection.

(b) List the sources and routes of transmission of viruses, citing specific example of virus in each case.

(c) Briefly elucidate the different sites for cultivating viruses in an embryo, citing specific example.

4. **(a)** With the aid of a well-labeled diagram, distinguish between the basic structure of a naked virus, an enveloped virus and a bacteriophage.

(b) Briefly explain the following:

i. Prophage state

ii. induction

iii. Cytopathogenicity

iv. Transformation

5. Discuss extensively the cell culture technique of cultivating virus.

6. **(a)** Elucidate the general properties of viruses.

(b) Why is virus an enigma of biology?

7. Highlight the structure, epidemiology, life cycle, pathogenesis and treatment options of a named virus.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2021/2022 SESSION

COURSE TITLE: PETROLEUM MICROBIOLOGY (2 UNITS)

COURSE CODE: MCB522

INSTRUCTION: Answer any **THREE** questions **TIME: 1hr 30mins**

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1 (a) Write a brief history of petroleum discovery in Nigeria, highlighting important events and dates.

(b) State the sulphur compounds present in the following fractions of petroleum with their characteristics:

(i) those within the boiling point range of 25 - 150℃

(ii) those within the boiling point range of 150 - 250℃

(iii) those with boiling point above 250℃

2 (a) How would you carry out petroleum prospecting in Bida basin using microbiologial technique?

(b) Discuss any five (5) factors that affect biodegradation of petroleum.

3 (a) Define bioremediation

(b) Describe the different approaches used to remediate crude oil polluted soil.

4 (a) Why are biosurfactants popular as high value microbial products?

(b) Highlight the importance of biosurfactants in the petroleum industry**.**

5. Discuss the roles of microorganisms in oil spills with references to Niger Delta region of Nigeria.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY,

SECOND SEMESTER EXAMINATION 2021/2022 SESSION

ENVIRONMENTAL MICRBIOLOGY (MCB 523) 3 UNITS

Instruction: Answer any Five (5) Questions in all. At least ONE Question from each section.

Time Allowed: 2½ Hours

SECTION A

1. (a). What are indicator organisms? Give five (5) examples of indicators of fecal contamination.
   (b). Mention eight (8) characteristics of an indicator organism.

2. (a). Microorganisms in air could be from (a) soil (b) water (c) humans (d) animal and plant sources. Discuss any three sources.
   (b). Describe the procedures employed in Microbiological analysis of air

SECTION B

3. Explain the roles of the two (2) groups of bacteria central to sulphur cycle.

4. (a). Discuss the significance of denitrification in the environment.
   (b). Give reasons why phosphorus cycle is not a problem in the atmosphere?

SECTION C

5. Marine microbes will likely grow on which media? Provide detailed justification for the likelihood of growth medium to support the growth of marine microbes.

6. (a). Distinguish between limnology and microlimnology.
   (b). What is the salient distinguish attribute between freshwater and marine ecosystems?

7. Explain in detail the link between Biochemical Oxygen Demand (BOD) and eutrophication as regards to waste water?

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER 2021/2022 SESSION
EXAMINATION QUESTIONS
Course Title: Pharmaceutical Microbiology (2 Units)
Course Code: MCB 525

Time: 2 hours

Instruction: Answer **four** questions in all. Attempt **two** questions **only in each section**

Section A

1. (a) What are antimicrobial agents? Describe the various types of such agents.

(b) Describe actions of antibiotics and their spectrum

(c) Explain the usage of Nalidixic acid as an antibiotic and show the structure

2. (a) Plant products could be candidates for the development of useful dugs, explain.
(b) Describe any 3 African medicinal plants and their usefulness in traditional medicine

3. (a) Discuss pharmaceutical ingredients susceptible to microbial attack.

(b) Give a detailed explanation on the control of spoilage of pharmaceutical products.

Section B

4. (a) Define Drug discovery

(b) Describe the modes of action of the following antibiotics
(i) Ciprofloxacin **(ii)** Chloramphenicol **(iii)** Ketoconazole
(iv) Vancomycin **(v)** Streptomycin **(vi)** Flucytosine

5. (a) Write short notes on the mechanisms of antimicrobial resistance
(b) Discuss the diffusion method of antimicrobial susceptibility testing

6. (a) Discuss Quality Control in Pharmaceutical microbiology.
(b) Explain the different methods of sterility testing.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2021/2022 SESSION

COURSE TITLE: MEDICAL PARASITOLOGY

COURSE CODE: MCB526 **UNIT: 3 UNITS**

INSTRUCTIONS: Answer **FIVE** questions. At least **TWO** questions should be answered from each section.

Time Allowed: 2hrs 30mins

SECTION A

1. **(a)** In a tabular form, name twenty parasites of medical or veterinary importance stating the source and mode of infection.

2. Compare the life cycle of *Trypanosoma cruzi* with that of *Trypanosoma vivax*.

3. **(a)** List the stages of the following parasites in the vertebrate and the invertebrate hosts:

i. *Plasmodium falciparum* **ii**. *Leishmania donovani* **iii**. *Wuchereria bancrofti*

(b) List the infective stages of the following parasites:

i. *Entamoeba histolytica* **ii.** *Trichomonas vaginalis*

iii. *Giardia lambia* **iv.** *Toxoplasma gondii*

(c) Name five diagnostic techniques employed in Parasitology.

SECTION B

4 Discuss the general life cycle of Trematodes.

5. Describe how parasites and host factors affect the outcome of a parasitic disease.

6. Why is schistosomiasis an important disease in Nigeria?

7. Write short notes on the morphology of the following:

i. *Paragonimus westermani*

ii. *Taenia saginata*

iii. *Hymenolepsis nana*