FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 211
COURSE TITLE: INTRODUCTION TO MICROBIOLOGY I (3 UNITS)
CLASS: 200 LEVEL
TIME: 1hr 30 min
Instruction: Answer two (2) questions from section A and one question from section B.

Section A

1. (a) Define microbiology and state the branches of microbiology
   (b) Enumerate the benefits of microorganisms

2. (a) Give the major achievement of each of the following microbiologists:
   (i) Louis Pasteur (ii) Robert Hooke
   (iii) Alexander Fleming (iv) Antonni Van Leeuwenhoek
   (v) Robert Koch
   (b)Give two named examples of each of the following:
   (i) Bacteria (ii) Fungi
   (iii) Parasites (iv) Algae
   (v) Viruses

3. Describe what you understand by the term microbial taxonomy and give the taxonomic rank of a named bacterium.

Section B

4. Discuss why you consider microbiology as an important course.

5. (a) List some of the ways we can study microorganisms.
   (b) Describe the general morphology of bacteria with named examples.

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SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2016/2017 SESSION
COURSE CODE: MCB 311- GENERAL MICROBIOLOGY (3 UNITS)

INSTRUCTION: *Answer **ALL** Questions in **Section A** and **Any** 3 Questions in **Section B***

TIME ALLOWED: *2 hours only*

SECTION A

(i) Write the colour taken up by the underlisted cells and their Gram stain reactions.

Bacterial species	Cell Colour	Gram Positive/Negative
(a) *Escherichia coli*		
(b) Staphylococcus epidermidis		
(c) Staphylococcus aureus		
(d) Pseudomonas aeruginosa		
(e) Bacillus subtilis		

(ii) Explain the fundamental difference between a simple and a differential staining.
(iii) Describe the function of the following in Gram Staining
  (a) Primary stain
  (b) Decolourizer
  (c) Counterstain
(iv) What culture will you advise individuals to use in Gram staining?
(v) Briefly describe the mechanism of Gram staining
(vi) Name the primary stain used in acid fast staining procedure
(vii) What is the aim of heating/steaming during the acid fast staining?
(viii) In clinical microbiology laboratory, the acid fast staining would be used for diagnosis of ..... and .....
(ix) What makes a microorganism non-acid fast?
(x) ..... aims to preserve the shape of cells
(xi) When organisms are stained and background is left unstained, we refer to the staining as .....
(xii) ..... dyes are used for direct staining
(xiii) Commonly used simple stains are
  (a) .....
  (b) .....
  (c) .....
(xiv) Presence or absence of metachromatic granules is demonstrated by ..... staining
(xv) ..... reagent is used in capsule staining
(xvi) ..... is used as primary stain in endospore staining

SECTION B

1a) Write short notes on the following: autoclave, mycorrhizae, eutrophication, chemotrophs, selective medium.
1b) With a relevant diagram, describe the life cycle of a named bacterium?

2a) Describe the lytic cycle of a t4 bacteriophage?
2b) If the magnification of the objective lens of a binocular microscope is 100x, what is its total magnification?

3a) In a tabular form, give 5 differences between Gram positive and Gram negative bacteria giving an example of each?
3b) What is the generation time of a bacterial population that increases from 10^4 cells to 10^7 cells after four hours of growth (Note: Log $10^7/10^4$ =3)

4a) Write 5 distinguishing features between a prokaryote and a eukaryote?
4b) Write a short note on the metabolism of t4 bacteriophage?

5a Discuss DNA Homology experiment?
5b) Explain the interrelated parts of microbial taxanomy?
5c) Explain the two quality of bacteria classification and list the general methods of classification?

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 312
COURSE TITLE: PRINCIPLE OF STERILIZATION & DISINFECTION (3 UNITS)
CLASS: 300 LEVEL
TIME: 2 HOURS
INSTRUCTION: Answer **Two Questions Only** from **Section A** and answer **All Questions** in **Section B** by filling in the correct answers in the blank spaces provided.

Section A

1. (a) What factors must a physician consider when determining the appropriateness of antibiotics for therapeutic use?
   (b) Discuss the difference between broad and narrow spectrum antibiotics
2. (a) What is MIC? Why is it a common test in clinical microbiology laboratory?
   (b) Why is it so difficult to find antimicrobial agents for treating viral diseases?

3. (a) What causes drug resistance in microorganisms?
   (b) Why is penicillin ineffective against bacteria that produce β-lactamase?

Section B

Matriculation Number: _____

1. In microbiology, contaminants are (1) _____ present at a given place and time that are (2) _____ or (3) _____.

2. Most decontamination methods employ either (4) _____, (5) such as (6) _____ or (7) _____, or (8) _____ such as (9) _____ and (10) _____.

3. A sterile object is totally free of (11) _____, (12) _____ and (13) _____.

4. When sterilization is achieved by a chemical agent, the chemical is called a (14) _____.

5. Sterilization is a process that (15) _____ or (16) _____ all (17) _____, including (18) _____.

6. Sterilization is also the process in which all (19) _____, including (20) _____, are (21) _____.

7. Disinfection is the (22) _____, (23) _____, or (24) _____ of (25) _____ that may (26) _____.

8. Disinfectants are agents, usually (27) _____.

9. Any process that destroys the non-spore forming contaminants on inanimate objects is called (28) _____.

10. The primary mode of action of non-ionizing radiation is to (29) _____.

11. The most versatile method of sterilizing heat-sensitive liquids is (30) _____.

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DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION 2016/2017 ACADEMIC SESSION
COURSE CODE: MCB 313 - MICROBIAL ECOLOGY (3 UNITS)

Instruction: Answer any **FOUR** questions **Time allowed: 2 Hours**

1a) Write short notes on the following terms as they relate to microbial ecology (i) rhizosphere, (ii) endogenous diseases, (iii) plankton, (iv) **phyllosphere, (v) ecological niche.**

1b) Discuss 5 impacts of microorganisms on the environment and human activities

2a) Discuss 5 ecological relationships that can be found in the rhizosphere

b) Give five (5) reasons why air is a non-hospitable environment for microbial growth.

3a) In a healthy animal, the internal tissues are normally free of microorganisms however, many other sites are readily colonized by various microbial species, most of which are beneficial to human health, discuss with relevant examples.

3b) List five factors influencing microorganisms in the rhizosphere.

4a) Describe 5 ways *Pyrolobus fumarii* adapt to their environment

4b. Give 5 reasons why the normal microbiota may be harmful to their host

5. Write short notes on mineralization, nitrification and denitrification in nitrogen cycle by microorganisms highlighting factors that affect each of them.

6. With relevant examples and distinguishing characteristics, discuss the following microbial interactions in soil environment

i. Cometabolism

ii. Protocooperation

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 411
COURSE TITLE: IMMUNOLOGY AND IMMUNOCHEMISTRY (3 UNITS)
CLASS: 400 LEVEL
TIME: 2 HOURS
Instruction: Answer question number **ONE** and any other three questions

1. Describe in details with adequate precautionary measures, how widal test can be conducted in the laboratory?
2. Explain the biological functions of immunoglobulins
3. Write an essay on types II and III hypersensitivity
4. Discuss all the pathways of complement activation
5. Describe in details antigens and antibodies reactions

6. (a) Explain primary and secondary immune responses
   (b) State the advantages and disadvantages of each

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 412
COURSE TITLE: FOOD MICROBIOLOGY (3 UNITS)
CLASS: 400 LEVEL
TIME: 2 HOURS
Instruction: Answer any 4 questions

1. Study the food specific attack rate table below, fill the blanks and answer the questions that follow.

Food	No of people who ate and were ill	No of people who ate and were not ill	Total no of people who ate	% of people who ate and were ill	No of people who did not eat and were ill	No of people who did not eat and were not ill	Total no of people who did not eat	% of people who did not eat and were ill
Kwose	60		85		58		71	
Moi-Moi		17	70			11	74	
Massa	64			80	48			72
Custard	51	10			17	68		

The symptom of food borne diseases occurred two hours after consumption of the food. It included dizziness, vomiting and diarrhoea
(a) What type of food borne disease is this?
(b) What is the incriminating food?
(c) What is the likely organism?
(d) List the serological type of the causative agent based on their morbidity
(e) How can future occurrence be prevented?

2. (a) What properties make bacteria important in food?
   (b) Certain factors favour production of botulism toxins. Enumerate them
   (c) What is histamine poisoning?

3. (a) Discuss microbial growth in succession
   (b) Distinguish between food poisoning and food infection
   (c) Describe the sequence of events that take place for food to get spoiled.

4. How would the following factors affect microbial activities in food
   (a) Water activity
   (b) Biological structure of food
   (c) Antimicrobial constituents of food

5. (a) What is single cell protein?
   (b) How does food fermentation provide food security and health benefit?

6. Write short notes on the following:

(a) Molecular method of detecting microorganisms in food
(b) Microbial enumeration by membrane filter technique
(c) Biological method of food preservation

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION

COURSE CODE: MCB 413

COURSE TITLE: INDUSTRIAL MICROBIOLOGY (3 UNITS)

CLASS: 400 LEVEL

TIME: 2 HOURS

Instruction: Answer Two Questions Only from Section A and answer All Questions in Section B by filling in the correct answers in the blank spaces provided

SECTION A

1. (a) Outline the procedures for the isolation of amylolytic bacteria from a natural environment.
   (b) Discuss any two (2) methods of culture preservation in a dehydrated form.

2. (a) What is strain improvement?
   (b) How could an industrial microbiologist maximize its profit through strain improvement?
3. Write a comprehensive essay on how microorganisms could be used to enhance the economy growth of a nation.

SECTION B

Matriculation Number: _____

1. The major brewing materials used in the brewery industry include:
   (1) a _____ (b) _____ (c) _____

(d) _____and (e)_____.

2. (2)_____(3)_____(4)_____

   (5)_____(6)_____(7) _____

   (8) _____ (9) _____ethanol.

   The end-product of the above pathway is ethanol. Fill in the correct answers in the blank spaces provided.

3. The dried, pre-sprouted grain that is soaked to activate enzymes for beer production is called (10) _____.

4. Hops are dried female flowers of the hops plant called (11)_____ and (12)_____.

5. The tannins of hops helps to (13) _____during the boiling of wort.

6. Some wine makers allow natural yeasts to dominate, but many wineries inoculate the must with a special strain of (14) _____.

7. The length of fermentation in wine production varies from (15) a _____days at temperatures varying between (b) _____ in (c) _____ and from (d) _____ days in (e) _____.

8. Bottom yeasts produce beer with a pH of (16) a _____ and requiring (b)_____ days of fermentation at temperature of (c) _____ with their alcohol content of (d) _____.

9. Top yeasts are used to produce the higher alcohol content of (17) _____.

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 414
COURSE TITLE: PRINCIPLE OF EPIDEMIOLOGY AND PUBLIC HEALTH (3 UNITS)
CLASS: 400 LEVEL
TIME: 2 HOURS
Instruction: Answer any 4 questions

1. (a) Differentiate between the following pairs as they relate to epidemiological study:
   (i) Epidemic and endemic
   (ii) Pathogenicity and infectivity
   (iii) Incidence rate and prevalence rate
   (iv) Herd immunity and risk factors
   (b) How would you control an epidemic of a reported case of typhoid fever in your locality?

2. (a) Describe the various steps involved in epidemiological investigation.
   (b) In 2016, a study was carried out regarding an outbreak of Flu in Bosso with a population of 150, 800. Using 1000 as a constant, determine the incident rate if the number of new cases is given as 100 and if 560 are already diagnosed with Flu before 2016.

3. Explain in details the strategies you can use to effectively control the spread of communicable disease from one state to another in Nigeria.

4. Discuss Nosocomial infection

5. Write short note on antigenic shift and antigenic drift and explain their effect on the efficacy of vaccines against specific pathogens.

6. Explain the spectrum of disease

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION

COURSE CODE: MCB 415

COURSE TITLE: MICROBIAL GENETICS AND MOLECULAR BIOLOGY (3 UNITS)

CLASS: 400 LEVEL

TIME: 2 HOURS

Instructions: Answer **Four Questions** in All; **Two** from each Section. Question one (1) is compulsory from section A.

Section A

AUG CUG AAA CCC AUG.....UAC CGA ACG UAA ACG GGG CUG ACC UUU

In the hypothetical gene shown above:

1. (a)(i) Illuminate what will happen when there is a deletion of C from the codon CGA?

   (ii). Produce the successive downstream codons.

   (iii). What is the name of the mutation in ii?

   (iv). State the two (2) new codons formed as a result of splitting the bases of the stop codon in the hypothetical gene above?

   (v). State the new stop codon of the mutation in ii and make a distinction between the stop codon in the hypothetical gene above.

   (b)

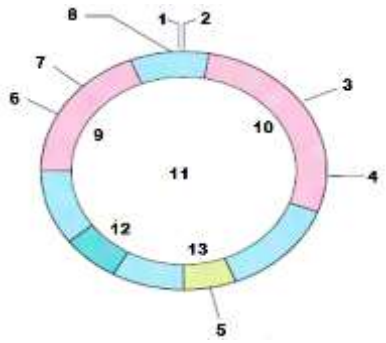

Figure 1

i. As a student of microbial genetics and molecular biology, provide a suitable title for the above Figures 1.

ii. Name 1-13 in Figure 1.

iii. Divulge the universal significance of Figure 1 in microbial genetics and molecular biology. (To be answered in 15 words).

2. (a) When mutations are established, what will happen to the offspring of chloramphenicol sensitive cells that mutate to chloramphenicol resistance? On rare occasion, however, the nucleotide will reappear to its previous state, resulting in the chloramphenicol resistant cells becoming chloramphenicol sensitive. Explicate briefly the phenomenon.

   (b) How many base pairs would have to be deleted in a mutational event to eliminate a single amino acid from a protein and not change the rest of the protein?

3. (a) 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?

   (b) How can you artificially stimulate a bacterium in the laboratory to take up DNA fragments from the environment? (To be answered in 15 words).

Section B

4. Explain the major roles of RNA in the metabolism of prokaryotes.

5. DNA is an amphipathic molecule. Discuss.

6. Discuss the synthesis of ribosomal RNA.

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 511
COURSE TITLE: PATHOGENIC BACTERIOLOGY (3 UNITS)
CLASS: 500 LEVEL
TIME: 2 HOURS
Instruction: Answer any four (4) questions

1. Discuss bacterial toxin. Compare and contrast the different types of toxin and give specific examples.

2. (i) Write short notes on bacterial virulence
   (ii) Explain three mechanisms by which bacteria demonstrate it.

3. (i) Describe bacterial morphology
   (ii) Explain the roles of at least three bacterial organelles

4. Give at least ten bacterial pathogens and highlight the mechanisms of pathogenesis of each of them.

5. Using standard laboratory procedures, explain how you will show that a given sample of bacterial culture contains *Staphylococcus aureus*.

6. (a) Describe the procedures for carrying out the following laboratory tests: lactose fermentation, methyl red, indole, gas formation, and sugar fermentation.

   (b) How will you quickly differentiate the following bacteria in the laboratory? *Pseudomonas aeruginosa, Escherichia coli, Staphylococcus aureus, Salmonella typhi,* and *Streptococcus pneumoniae*

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 512
COURSE TITLE: FERMENTATION TECHNOLOGY (3 UNITS)
CLASS: 500 LEVEL
TIME: 2 HOURS

Section A
Instruction: Answer only two (2) questions in this section. Question one is compulsory

1. (a) The maximum specific growth rate of an organism used in a chemostat for the production of microbial biomass is 0.40 h^{-1} and the specific growth rate dictated by the dilution rate was 0.30 h^{-1}, what was the substrate concentration at the steady state and the flow rate if the volume of the reaction vessel was 1.5 L? Assume the substrate utilization constant is 20mgL^{-1}.
   (b) A strain of *Lactobacillus bulgaricus* used in the production of yoghurt was known to divide every 30 minutes, if 1×10^3 cells were used to inoculate 100 mL liquid milk, how many bacterial cells would be present after 6 h of fermentation? What is the specific growth rate and the generation time of the organism?
   (c) Outline the sequence of events that occur when the substrate is reduced below the level that support the growth rate controlled by the dilution rate in a continuous culture system of fermentation.
2. (a) Describe the downstream processing for the purification of an intracellular microbial enzyme.
   (b) Enumerate five (5) major groups of industrial fermentation processes with their relevant examples.
3. (a) Explain briefly how industrial fermentation could contribute to the economy growth of a nation.
   (b) Distinguish between fed-batch and continuous system of fermentation.
   (c) Why is fed-batch system more preferred for the cultivation of baker's yeast?

Section B
Instruction: Attempt any two questions in this section

4. (a) Describe food fermentation with appropriate examples
   (b) List the two types of fermentation and explain the principles behind any of the listed types with production technique
5. (a) Explain the advantages and disadvantages of batch fermentation process. What is the role played by head space?

(b) Give two examples of the following fermented foods classified by substrate type:
(i) Bean based (ii) Fruit based
(iii) Dairy based (iv) Grain based
(v) Vegetable based

6. (a) Enumerate the basic functions of a fermenter
(b) Write short notes on the following:
(i) Baffles (ii) Sparger
(iii) Chemostat (iv) Foam control

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DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 513
COURSE TITLE: GENERAL TOXICOLOGY (3 UNITS)
CLASS: 500 LEVEL
TIME: 2 HOURS
Instruction: Answer four questions, at least two from each section

SECTION A

1. Write short notes on the following: Pyrrophyceae, Cyanophyceae and Chrysophyceae, carcinogens and lethal dose
.
2. Describe the following: Aflatoxins, Sterigmatocystin, Trichothecenes, *Corynebacterium diphteriae,* and *Clostridium*

3. a. Explain the mechanism of drug resistance
b. The techniques of removal of toxic substances from patients

SECTION B

4. a. Highlight the factors that can predispose an individual to drug toxicity
b. write short notes on any two mechanisms of drug toxicity

5. With relevant examples discuss three natural toxicants and their effects on human body

6. a. Write short notes on different techniques that can be employed to manage acute drug toxicity

b. What are the factors that modulate effects of toxicant in human body?

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FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 512
COURSE TITLE: FERMENTATION TECHNOLOGY (3 UNITS)
CLASS: 500 LEVEL
TIME: 2 HOURS

Section A
Instruction: Answer only two (2) questions in this section. Question one is compulsory

1. (a) The maximum specific growth rate of an organism used in a chemostat for the production of microbial biomass is 0.40 h^{-1} and the specific growth rate dictated by the dilution rate was 0.30 h^{-1}, what was the substrate concentration at the steady state and the flow rate if the volume of the reaction vessel was 1.5 L? Assume the substrate utilization constant is 20mgL^{-1}.
   (b) A strain of *Lactobacillus bulgaricus* used in the production of yoghurt was known to divide every 30 minutes, if 1×10^3 cells were used to inoculate 100 mL liquid milk, how many bacterial cells would be present after 6 h of fermentation? What is the specific growth rate and the generation time of the organism?
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   (b) Distinguish between fed-batch and continuous system of fermentation.
   (c) Why is fed-batch system more preferred for the cultivation of baker's yeast?

Section B
Instruction: Attempt any two questions in this section

4. (a) Describe food fermentation with appropriate examples
   (b) List the two types of fermentation and explain the principles behind any of the listed types with production technique
5. (a) Explain the advantages and disadvantages of batch fermentation process. What is the role played by head space?
   (b) Give two examples of the following fermented foods classified by substrate type:
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   (v) Vegetable based
6. (a) Enumerate the basic functions of a fermenter
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   (iii) Chemostat (iv) Foam control

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DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION 2016/2017 SESSION

COURSE CODE: MCB 516

COURSE TITLE: INTRODUCTION TO BIOTECHNOLOGY (3 UNITS)

CLASS: 500 LEVEL

TIME: 2 HOURS

INSTRUCTIONS: Answer **Four Questions** in All; **Two** from each Section. Question one (1) is compulsory from section A.

Time Allowed: 2 Hours

Section A

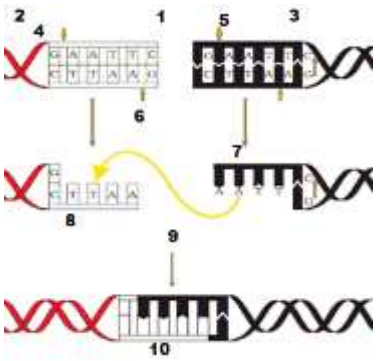

Figure 1

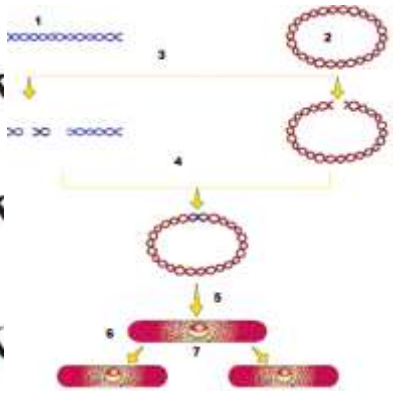

Figure 2

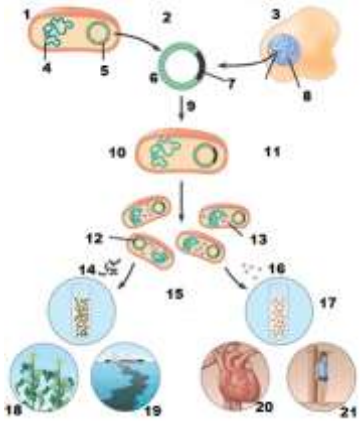

Figure 3

1. (a). As a student of biotechnology, provide a suitable title for the above Figures 1-3 in biotechnology and genetic engineering.

   (b). Name 1-10, 1-7 and 1-21 in Figures 1-3 respectively.

   (c). Mention the salient feature universal to the three (3) figures and its significance in biotechnology and genetic engineering.

2. A case of defective coagulation factor gene was reported to the school clinic from a student. Observable signs and symptoms were detected by the doctor.

   (a) As a student of biotechnology, kindly explicate to the doctor on how to treat or cure the disease condition using genetic engineering and biotechnology techniques.
   (b) What is the name of this genetic defect?

3. Write a compendium of historical advancement and important milestones of biotechnology with regards to time period and major break-through. (To be answered in a tabular form).

Section B

4. (a) What is Enzyme Immobilization?

   (b) List the three major groups of supports for Enzyme Immobilization and three examples for each support.

   (c) List five methods of Enzyme Immobilization.

5. (a) Give three examples and three characteristics of secondary metabolites

   (b) Discuss any three of the following terms: (i) Bioconversions (ii) Induction (iii) Phosphate regulation (iv) End product regulation (v) Catabolite regulation.

6. (a) What are the necessary steps needed for the purification of a product?

   (b) List three types of each of the following product purification operation: (i) Chromatography (ii) Centrifuges.

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DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION 2016/2017 SESSION
COURSE CODE: MCB 517
COURSE TITLE: ENTREPRENEURSHIP (2 UNITS)
CLASS: 500 LEVEL
TIME: 1hr 30 min
Instruction: Answer only three (3) questions at least one question from each section

Section A

1. (a) What factors motivate entrepreneurship?
   (b) Enumerate six (6) sources of entrepreneurship ideas

2. Taking into cognizance the raw materials, discuss the production of the following home made products
   (i) Ginger ale drink
   (ii) Bread loaf

3. Ability to make good decisions is essential to success in business. Discuss

Section B

4. (a) What is entrepreneurial microbiology?
   (b) Discuss the prospects of entrepreneurial microbiology in a developing country.

5. How would you use effective microorganisms to boost food and animal production in a country faced with economic recession?

6. Biogass technology is more sustainable in Nigeria than Cotonou. Discuss

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION 2016/2017 SESSION
INTRODUCTION TO MICROBIOLOGY II (MCB 221) 3 UNITS

INSTRUCTIONS: Answer All Questions.
Time Allowed: **30 Minutes**
Matriculation Number: _____

Section A

Name 1-13 and provide a suitable title to Figure 1 and 2.

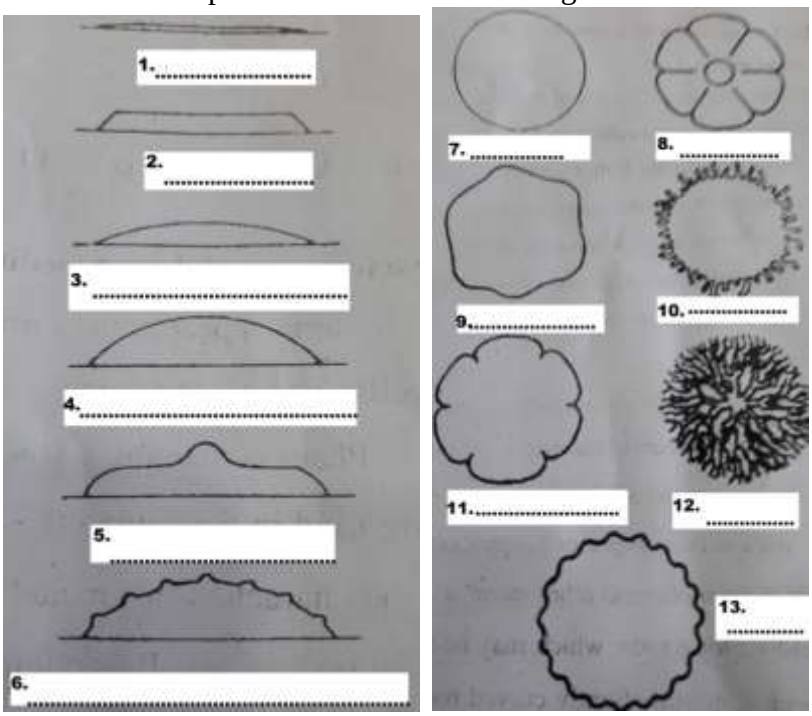

Figure 1 (14)..... Figure 2 (15).....

Fill in the correct answers in the blank spaces provided (16-20)

Some varieties of culture media use in Microbiology Laboratory include (16) _____ (17) _____ (18) _____

(19) _____and (20) _____

FEDERAL UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF MICROBIOLOGY
INTRODUCTION TO MICROBIOLOGY 2 (MCB 221)
SECOND SEMESTER EXAMINATIONS
2016/2017 ACADEMIC SESSION
SECTION B

Name; ……. Mat No.; ……
INSTRUCTIONS; **Answer all questions** Time Allowed: **45 Minutes**

Match the choices from column B with the appropriate statements in column A

Column A	Column B
1. Dye repelled by bacteria	(a) Gram stain technique
2. Iodine used	(b) Acid-fast technique
3. Developed in 1880s	(c) Simple stain technique
4. Carbon fuchsin used	(d) Negative stain technique
5. Uses alcohol decolorizer	
6. Microorganisms outlined in stain	
7. Basic dye used	
8. Acid – alcohol decolorizer	
9. All bacteria divided to two groups	
10. Mycobacterium detected	

Completion; Add the word or words that best complete each of the following statements

11. The unit most often used to measure the diameter of viruses is the _____
12. Whereas a simple microscope has a single lens, a compound microscope has_____
13. The ability of a microscope to distinguish two closely related points is called _____
14. A meter is equivalent to micrometers that number_____
15. The part of the microscope known as the condenser consist of a series of _____
16. Among the microorganisms most often studied with the phase contrast microscope are the_____
17. Two types of electron microscopes are the transfusion electron microscope and the _____
18. Bacteria and microorganisms must be stained before microscopy because their cytoplasm is usually _____
19. Those stains that carry a positive charge are referred to as _____
20. Among the smallest bacteria are three groups known as rickettsiiae, chlamydiae and _____

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DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2016/2017 SESSION
INTRODUCTION TO MICROBIOLOGY II (MCB221)

SECTION C

INSTRUCTION: Answer all Questions **MATRIC. NO.:**

Time Allowed: 1Hr

Define the following:

1.Ecology:----------

2. Niche:----------

3. Habitat:----------

4. Limiting factors----------

5. Extremophiles species:----------

- What is the role of the following organisms in an ecosystem:

6.Producer:----------

7.herbivore:----------8.carnivore:----------

9.omnivore:----------

10.decomposer:----------

11.How many trophic levels has this food chain: ~~Grass~~ ▶ Goat ——▶Man

- List three elements of aseptic techniques: (12)

(13) (14)

15. When several food chains overlap and intersect is called ----------

- Briefly describe the following relationships

16. predator-prey:----------

17. parasite-host: ----------

18. mutualism: ----------

19. commensalism: ----------

20. cooperation: ----------

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: MEDICAL MYCOLOGY
COURSE CODE: MCB 322 (3 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer all questions in this Section
Time allowed: 1HR

Section A

1. Describe the various clinical manifestitations of candidiasis
2. Name the dimorphic fungi and describe the morphology and pathology of any one of them

3a. What are the unique features of dermatophytes?

b. Define the following terms and give three examples for each:

(i) Anthropophilic dermatophyte (ii) Zoophilic dermatophyte

(iii) Geophilic dermatophyte

4 Outline the detail procedure in carrying out diagnosis of dermatomycosis in a clinical laboratory

5 Name the various systemic mycoses and discuss any one of them

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DEPARTMENT OF MICROBIOLOGY
MYCOLOGY (MCB 322)
SECOND SEMESTER EXAMINATION, 2016/2017 SESSION

SECTION B

Mat No.; ……

INSTRUCTIONS; Answer all questions Time: 1HR

Matching; select from Column B the class of fungi that fits the description in Column A

Column A	Column B
1. Form ascospores	(a) Chytridiomycetes
2. Common mushroom	(b) Zygomycetes
3. "Imperfecti fungi"	(c) Ascomycetes

4. Zygospore forms
5. Form oospore
6. Include the fermentation yeast
7. No known sexual cycle
8. Spore-beaning sexual structures
9. *Candida albicans* a member
10. Species causes ergot disease
11. Non septate hypae with sporangiospores
12. Rhizoids for anchorage
13. Include Rhizopus
14. Include rust & smut fungi

(d) Basidiomycetes
(e) Deuteromycetes

Completion; Add the word or words that best complete each of the following statements

15. Those fungi which are biphasic occur as yeast or as _____
16. Fungi tolerates environments that are high in sugar and high in _____
17. Yeasts are notable for their ability to live in the presence or absence of _____
18. Where the bacterial spore is used for resistance, fungal spore is used for _____
19. Asexual spore formed within a sporangium are known as _____
20. Fungi display a mode of nutrition that is _____
21. The cell wall of fungi contains cellulose, chitin and polymers of glucose known as _____
22. Those hyphae that form the reproductive structures of the fungus are called _____
23. The typical shape observed in a common yeast cell is called _____
24. The metabolic process performed by yeast and used in the beer and wine industries is called _____
25. The sexual reproductive process of a fungus, the terms “male” and “female” are used interchangeably with the term _____
26. Fungi are separated into two major divisions, with the true fungi placed into the division _____
27. Budding is the type of reproduction used by _____
28. The fungus used to ferment soybeans to soy sauce, to modify steroids and in the production of organic acids is _____
29. The mushroom agaricus is safe to eat, but the poisonous mushroom belongs to the genus _____
30. All of the following are considered fungi except
31. Mushrooms b. Yeasts c. Molds d. Amoebas
32. Those fungi which are biphasic occur as yeast or as _____
33. Fungi tolerates environments that are high in sugar and high in _____
34. Yeasts are notable for their ability to live in the presence or absence of _____
35. Where the bacterial spore is used for resistance, fungal spore is used for _____
36. Asexual spore formed within a sporangium are known as _____
37. Fungi display a mode of nutrition that is _____
38. Yeasts are notable for their ability to live in the presence or absence of _____
39. The important feature in the reproduction of fungi is the

a. Septa b. Spore c. Structure of the cell wall d. Type of Nutrition

40. Both blastospores and arthrospores are
    a. Types of sexual spores c. Produced by yeasts d. similar to bacteria
    b. Various kinds of asexual spores

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

MICROBIOLOGY DEPARTMENT

SECOND SEMESTER EXAMINATION, 2016/2017 SESSION

COURSE: Microbial Physiology and Metabolism (MCB323, 3Units)

Instructions: Answer **FIVE Questions** in All: **AT LEAST ONE** from each **Section**.

Time Allowed: $2^1/_2$ Hours

SECTION A

1. (a) What is bacterial growth?

   (b) How can cells multiply when they have exhausted their supply of nutrients?

2. (a) What happens when a stock culture stored in the refrigerator for several weeks is inoculated into fresh medium? Provide a suitable reason for your answer.

   (b) Briefly explain what happens if young cells are transferred to a medium similar in composition?

SECTION B

3. (a) (i)What are the major pathways for energy generation in microorganisms?

   (ii) Enumerate the steps in protein synthesis.

   (b) Describe the two sub processes involved in catabolism.

   (c) Distinguish between oxygenic and anoxygenic photosynthesis.

4. (a) (i)What are the major components of electron transport chain?

   (ii) Describe purine synthesis in bacteria.

   (b) Explain the term “anaplerotic pathway.”

   (c) Discuss the functions of pentose phosphate pathway in heterotrophs.

5. (a) (i).Describe the type 2 reaction center in photosynthetic microorganisms.

(ii)What are non-sense codes? List them.

(b) What is the primary purpose of glyoxylate cycle in metabolism.

(c) With examples distinguish between homofermenters and heterofermenters.

SECTION C

6. (a) What is water activity?

(b) How do hypotonic and hypertonic solutions affect microbial activities? Explain how microorganisms adapt to these environmental conditions?

(c) Describe microaerophiles and facultative anaerobes.

7. (a) How does a higher temperature above the optimum growth temperature of an organism affect its activities?

(b) Describe how Coulter counter method is used to measure microbial growth.

(c) Outline how anaerobic microorganisms can be cultured in the laboratory.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

COURSE TITLE: MICROBIOLOGICAL TECHNIQUES

COURSE CODE: MCB 324 (3 units)

SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer 5 questions in all (attempt at least 2 question in each section)
Time : $2^{1}/_{2}$ Hours

Section A

1. a). i, Enumerate the characteristics often used as additional aid to identification in bacteriology

ii, With named examples, distinguish between selective and differential medium

b). Enumerate the precautions to be taken in the course of pour plating in pour plate technique

2. a). Calculate the CFU/ml of fruit juice samples submitted to the laboratory for analysis if 207 and 209 colonies were counted in a duplicate plating sample after dispensing 0.1ml of 10^{-5} dilution.

b). i, Distinguish between synthetic and non-synthetic medium

ii, How are cultures preserved using soil?

3. a).What are the components of a good "Materials and Methods" in good scientific writing?

   b). i, Describe the procedure for nutrient agar preparation if 200ml quantities is required. Nutrient gar is usually weighed 28g/L

   ii,Describe the Gram staining procedure

4. a).Describe the operation of an autoclave

   b). Discuss the Bacitracin and Bile solubility tests in biochemical identification of bacteria.

Section B

5. (a) Describe catalase test and explain how this test is used to distinguish bacteria
   (b) Discuss the morphology of bacteria

6. (a) Explain classification and identification of bacteria
   (b) What are vitamins? Describe the B vitamins giving their specific names

7. (a) List 6 laboratory tests used in identification of bacteria
   (b) Describe serology and briefly explain its uses

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: VIROLOGY
COURSE CODE: MCB 521 (3 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer any five (5) questions
Time allowed: $2^1/_2$ Hours

1a. Explain in details the lytic phase of viral replication

b. Enumerate the properties of a viral particle

2. Given a blood sample that is suspected to contain Hepatitis C virus particle, describe details of analysis you will carry out on the blood sample to confirm the presence of the virus in the given sample.
3. Write an essay on Monkey pox virus
4. Virilogists have proposed that lysogenic phase of viral replication should be considered as an alternative to cloning. Discuss the pros and cons of this proposal?
5. In a tabular form clearly differentiate between the underlisted Hepatitis viruses
   (i) Hepatitis A
   (II) Hepatitis B
   (III) Hepatitis C
6. Describe in details how Rubella can be diagnosed and prevented
7. Briefly explain the important medical considerations in viral diseases

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: PETROLEUM MICROBIOLOGY
COURSE CODE: MCB 522 (2 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer any 3 questions
Time allowed: $1^1/_2$ Hours

1a) Write a short note on the following terms: (i) Biocompetitive exclusion (ii) Biodeterioration (iii) Biofilm (iv) Biogas composition (v) Dissimilatory sulphate reduction
1b) Outline the mechanism of biodegradation of a named hydrocarbon.
1c) Differentiate between detention time and retention time as it relates to anaerobic digestion.

2a) Describe the microbiology of methanogenesis.
2b) Outline the mechanism of corrosion by methanogenesis

2c) List five impacts of sulphate reducing bacteria in the environment

3a) Define Microbial Enhanced Oil Recovery (MEOR)
3b) Discuss the different mechanisms of Microbial Enhanced Oil Recovery

4a) Enumerate five characteristics of microorganisms that enable them to degrade petroleum products
4b) Discuss the chemical composition of petroleum

5) In the petroleum industry, surface-active agents from microorganisms are preferred to synthetic surfactants. Discuss

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: ENVIRONMENTAL MICROBIOLOGY
COURSE CODE: MCB 523 (3 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer any 5 questions
Time allowed: $2^1/_2$ Hours

1a) Write short notes on the following: (i) Plankton, (ii) eutrophication, (iii) biosorption, (iv) bioaccumulation, (v) bioconcentration.
1b) Describe two methods by which elements are made readily available by microorganisms?

2a) Differentiate between bioamplification and bioactivation?
2b) List 5 factors influencing the bioaccumulation and biodegradation of pesticides in the environment?

3a) Write briefly on 5 impacts of pesticides contamination on the environment?
3b) Outline 5 ways you would minimise the negative effects of pesticides in the environment?

4a) Discuss the different categories of contaminants present in wastewater and how it can be treated biologically.
4b) Highlight the objectives of wastewater treatment.

5a) What are the dangers associated with the presence of microorganisms in the air?
5b) Discuss three mechanisms used by microorganisms in the air to adapt to unfavourable environment.

6a) Enumerate the differences between exotoxins and endotoxins
6b) Write short notes on the following: (i) Ergot, (ii) Aflatoxins, (iii) *Fusarium* toxins, (iv) Bacillosis, and (v) *Cyanobacteria diphtheriae*

7a) Write short notes on any three of the following
i) Biopesticides
ii) Bioleaching
iii) Organophosphate
iv) Alkanes in petroleum
b) Explain the detrimental effects of Sulphur Cycle

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: PHARMACEUTICAL MICROBIOLOGY
COURSE CODE: MCB 525 (3 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Time Allowed : $2^1/_2$ Hours
Instruction: Answer 5 questions in all (attempt at least 2 questions in each section)

Section A

1. (a) What is pharmaceutical microbiology?
   (b) List 10 secondary metabolites of plants origin that are useful in pharmaceutical microbiology
   (c) State the traditional Welsh and American rhymes and explain their relevance in medicine

2. (a) Explain the following terms as they are used in pharmaceutical microbiology
   i. Chemotherapy
   ii. Prophylaxis
   iii. Drug
   iv. Antibiotic
   v. Vaccine
   vi. Antimicrobial agent
   vii. Synthetic, naturally occurring and semi synthetic agents
   (b) Give a diagramatical representation of the core structure of cephalosporin

3. (a) List the pharmaceutical ingredients that make pharmaceutical products susceptible to microbial attack
   (b) What are the observable effects of microbial attack on pharmaceutical products?
   (c) Enumerate the parameters to be controlled in order to mitigate spoilage of drugs and other pharmaceuticals.

4. (a) Discuss the role of NAFDAC in the quality control of pharmaceuticals in Nigeria
   (b) Explain control of the phased production and control of final products of pharmaceuticals
   (c) Describe the following:
   i. Validation activities and monitoring
   ii. Analytical development of new products and stability

Section B

5. (a) Giving specific examples, describe the possible effects of mutational resistance in microorganisms.
   (b) Explain how a microbiologist may contribute to incidence of microbial resistance

6. Explain how you would determine the susceptibility of an organism to a plant extract by poison food techniques

7. Discuss the general mode of action of antiseptics and disinfectants.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
COURSE TITLE: MEDICAL PARASITOLOGY
COURSE CODE: MCB 526 (3 units)
SECOND SEMESTER EXAMINATION, 2016/2017 ACADEMIC SESSION

Instruction: Answer five (5) questions with at least two questions from each section
Time allowed: $2^1/_2$ Hours

SECTION A

1a) Identify and discuss at least three factors that promote the spread of helminthic diseases in Nigeria
1b) for each factor in (1a) above suggest public health measures for overcoming them

2. Discuss the importance of each of the underlisted concepts to the study of parasites
(a) Morphology (b) Geographical distribution (c) Diagnosis (d) Life cycle
(e) Host-Parasite interaction

3) Identify a parasitic disease for which haematuria is a key symptom and discuss it under the following headings
(a) Transmission (b) Pathology (c) Prevention (d) Control

SECTION B

4) In a tabular form under the following headings compare Bancroft filariasis and River blindness:
   (i) Parasites
   (ii) Symptoms
   (iii) Transmission
   (iv) Prevention
   (v) Treatment

5) Discuss malaria and its transmission in an Urban Slum

6) Describe the various classical methods used in the diagnosis of parasitic infections

7a) Name two examples each of the important groups of parasitic protozoa
b) In what ways is the environment important in the transmission of parasitic disease?