FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
MICROBIOLOGY DEPARMENT
FIRST SEMESTER EXAMINATION, 2017/2018
COURSE: INTRODUCTION TO MICROBIOLOGY I (MCB 211), 2UNITS

INTRUCTIONS: Answer TWO questions in Section A and ONE Question in Section B. All Questions carry equal marks

TIME: $1^1/_2$ Hours

SECTION A

1. (a) (i) Define microbiology, mention variety of microorganisms
   (ii) Majority of microorganisms have nothing to do with infection, diseases, 99% of microorganisms contribute to the quality of human life. Explain/ comment.
   (b) Explain the dogna "theory of spontaneous generation".
2. (a) Explain the contributions of the following scientists to the field of Microbiology
   (i) Anthony von Leuwenhoek
   (iii) Robert Hooke
   (iv) Alexander Fleming
   (v) Robert Koch
   (b) Give an account of the characteristics of bacteria
3. (a) The system of nomenclature for all living things is applied to microbial forms. Discuss
   (b) Give reasons why viruses are not considered microorganisms in strict sense.

SECTION B

4. Briefly discuss bacteria and fungi under the following headings
   (i) structure
   (ii) reproduction
   (iv) classification
5. (a) Write short note on the following
   (i) extremophiles
   (ii) psychrophiles
   (iii) halophiles
   (iv) acidophiles
   (v) piezophile
   (b) Give five importances of microbes to human.

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION
COURSE TITLE: GENERAL MICROBIOLOGY (MCB 311), 3UNITS

INSTRUCTIONS: ANSWER ALL THE QUESTIONS IN BOTH SECTIONS TIME: $1^1/_2$ Hours

Section A

1a) Define pure culture

b) Give 2 examples each of a general purpose medium, a differential medium and a selective medium for culturing bacteria

2a) With a relevant diagram, describe the life cycle of a named bacterium

b) If the objective lens of a microscope has a magnification of 100x, what is the total magnification of the microscope?

3. In a tabular form give 5 differences between Gram positive and Gram negative bacteria and give an example of each?

Section B. Answer all the questions by filling in the gap with terms that are most appropriate.

On the basis of function, culture media can be classified into different types such as

(1)……

(2)……

(3)……

(4). ……. is the name of the woman who suggested a role a role for agar agar (sea weed) commonly used today as a (5)…… agent in microbiological media.

6. During the preparation of culture media in the microbiological laboratory, ……..…….. is an important equipment used for sterilization.

(7). An important consideration in the choice of a medium for a specific bacterium is the …… …….. of the organism.

In the science of taxonomy, the three important considerations are (8) ……., (9)…… and (10) ……..

(11). A microscope is said to be ……. if the objective lens is changed and it does not lead to the loss of focus.

(12). …… defines the ability of a microscope to present two different points in a magnified image as distinct and separate.

(13). The …… of light and the (14) …….. of the medium between the objective and the slide are important to the magnification produced by a microscope.

(15). A microscope is described as a compound microscope if it ……. ……..

(16). An electron microscope is so called because ……... ……..

(17). Numerical taxonomy involves the process of classifying organisms on the basis of their …… …….

(18). The system of scientific naming that is commonly used living organisms is called …… ……

(19). The condenser in a microscope helps to ……...

(20). Microorganisms cannot be seen with the naked eye except with the aid of a ……..

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

MICROBIOLOGY DEPARTMENT

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION

COURSE : PRINCIPLES OF STERILIZATION & DISINFECTION (MCB 312), 2 UNITS

Instruction: Attempt two (2) questions in section A and any other one in section B

Time allowed: $1^1/_2$ Hours

SECTION A

1. (a) How do microorganisms survive in the natural environment? (7 marks)
   (b) What is growth? (4 marks)
   (c) Briefly explain how to measure microbial cell concentrations. (4 marks)

2. (a) Sterilization is an absolute term. Explain. How does sterilization differ from disinfection? (5 marks)
   (b) Classify sterilization methods (2 marks)
   (c) Discuss sterilization at the temperature of 100^{o}C (8 marks)

3. Discuss fully viral inactivation (15 marks)

SECTION B

4. (a) Why is it essential to perform antimicrobial susceptibility testing?
   (b) What is Kirby – Bewer test?
   (c) What is an MIC and MBC? Why is MIC a common test in clinical microbiological laboratories.

5. (a) Write short notes on the following:
      (i) Chemotherapeutic agents
      (ii) Supportive therapy
      (iii) Combined drug therapy
      (iv) Antibiotic(r) drug resistance
   (b) State major toxicity of the following antibiotics.
      (i) cephalosporins
      (ii) Aminoglycosides
      (iii) Chloramphenicol

(iv) Isoniazid

(v) Sulfonamide

(c) Mention five antibiotics each that affect cell wall and protein synthesis of bacteria

INTRUCTIONS: Answer TWO questions from this Section. All Question carry equal marks

SECTION B

1. (a) Why is it essential to perform antimicrobial susceptibility testing?

   (b) What is Kirby – Bewer test?

   (c) What is an MIC and MBC? Why is MIC a common test in clinical microbiological laboratories.

2. (a) Why is it easier to find antibacterial agents that to discover useful antifungal and antiviral agents?

   (b) Why is penicillin ineffective against bacteria that produce β- lactamases?

   (c) Explain the difference between broad spectrum and narrow spectrum antimicrobics with examples.

3. (a) Write short notes on the following:

   (i) Chemotherapeutic agents

   (ii) Supportive therapy

   (iii) Combined drug therapy

   (iv) Antibiotic(r) drug resistance

   (b) State major toxicity of the following antibiotics.

   (i) cephalosporins

   (ii) Aminoglycosides

   (iii) Chloramphenicol

   (iv) Isoniazid

   (v) Sulfonamide

   (c) Mention five antibiotics each that affect cell wall and protein synthesis of bacteria

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATIONS, 2017/2018 SESSION
COURSE TITLE: MICROBIAL ECOLOGY
COURSE CODE: MCB 313 (3 UNITS)

INSTRUCTION: ANSWER FOUR QUESTIONS ONLY TIME: 2 HOURS

1a. Microbial interactions are crucial for a successful establishment and maintenance of a microbial population, Discuss with relevant examples

b. Explain the association in which aerobic microorganisms help obligate anaerobes to grow by consuming oxygen in the environment.

2a. Mention two ways each by which *Polaromonas vacuolata* and *Helicobacter pylori* adapt to their environment.

b. With relevant example, differentiate between the following pairs:

i. Rhizosphere and phyllosphere

ii. Autochthnous and allochthonous microorganisms

iii. Mesophiles and halophiles

3a. The human body is habitat for microorganisms, discuss with relevant examples.

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

4. Discuss the role of microorganisms in the cycling of carbon in the environment.

5a. Define bioaugmentation (b) Discuss the relative rates by which microorganisms can degrade organic pollutants in soil in Ogoni land (Nigeria) and Groningen (The Netherlands).

6. Denitrification process is enhanced by root exudates and dead root tissues in the soil. Discuss

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION

IMMUNOLOGY AND IMMUNOCHEMISTRY (MCB 411) 3 UNITS

INSTRUCTIONS: Answer any **FIVE Questions**.

Time: 2Hours

1. Explain the following terms with relevant examples:
   (i) Natural passive immunity
   (ii) Artificial active immunity
   (iii) Hapten
   (iv) Herd immunity

2. (a) Discuss in details primary and secondary immune responses to infection
   (b) Enumerate the merits derived from secondary immune response

3. (a) Explain the three pathways of complement activation
   (b) Enumerate the similarities and differences associated with the three pathways

4. Write an essay on antigens

5. How can you regulate the effect of complement in immunological response?

6. Mr Shabaze has been diagnosed of inability to produce antibodies to fight an infection. What are the steps to be taken to effectively manage the situation? Assuming, no antibiotic is available

7. Explain with specific examples, how immunologlobulins can activate complement via the classic pathway.

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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION

FOOD MICROBIOLOGY (MCB 412), 3 UNITS

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

.**Time Allowed: 2Hours**

SECTION A

1. (a) Discuss extensively how the growth of microorganisms in food could be beneficial to man
   (b) What is the significance of nucleic acid probe in food microbiology?

2. (a) Explain vividly how the control of water activity (a_w) would affect microbial activities in food?

   (b) (i) Mention six (6) routes of microorganisms in food

   (ii) Discuss briefly the use of microorganisms as source of food for man

3. (a) How does storage of dried food samples under high relative humidity (RH) affect microbial activities in food

   (b) Describe the biological and physical methods of preventing microbial activities in food.

4. Write short notes on the following methods of determining microbial load in food samples:

(i) Dye reduction
(ii) Direct microscopic count
(iii) Culturing technique

SECTION B

5. (a) Differentiate between food borne infection and food intoxication and which of them is most harmful? Justify your answer with reasonable explanation.

(b) Mention five (5) bacteria agent of food borne illness.

6. (a) What are the intrinsic factors that influence food spoilage and how do they exert their effect

(b) List the natural antimicrobial substance found in the following food:

(i) Fruit and vegetable

(ii) Oregano

(iii) Herb and spices

(iv) Garlic

(v) Basil

7. (a) Aflatoxins are produced by which microbial genus? How do they affect man?

(b) Why is fumonisins a concern? If improperly stored, what are the major foods and feeds that are likely to contain it?

(c) What types of chemicals can be used to preserve foods?

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION

INDUSTRIAL MICROBIOLOGY (MCB 413) 3 UNITS

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

.**Time Allowed:** **2 Hours**

SECTION A

1. (a) Define the following: industrial microbiology, fermentation, fermentor, beer, wine and foam in industrial fermentation. 2 marks each (2 x 6 = 12).

2. (a) Write short notes on the following: 1. Basic function of a fermentor 2. Aeration and agitation in a fermentor. 2.5 marks each (2.5 x 2 = 5 marks).
   (b) List 7 principles for good practice of fermentor. 1 marks each. (1 x 7 = 7 marks).

3. (a) What is patent law in industrial microbiology? 2 marks.
   (b) Mention briefly 4 major groups of commercially important fermentations. 2.5 marks each (2.5 x 4 = 10 marks).

4. (a) What is top fermented beer? (2 marks).
   (b) List the steps in beer and wine production (10marks). 1 marks each. (1 x 10 = 10. marks).

SECTION B

5. (a) Outline the procedures for the isolation of keratinolytic bacteria from a natural environment.
   (b) Describe One-Variable-at-a-Time (OVAT) method of fermentation process optimization.
6. (a) Explain vividly how an industrial microbiologist can maximize its profit through strain improvement.
   (b) What are the merits and demerits of hunting natural environments for microorganisms of industrial importance?
7. (a) Discuss briefly the significance of industrial microbiology in the development of national economy.
   (b) Describe how industrial microorganisms can be preserved in the soil.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2017/2018 SESSION
PRINCIPLES OF EPIDEMIOLOGY & PUBLIC HEALTH (MCB 414), 3UNITS

Instruction: Answer any five questions
Time: 2 Hours

1. Define the following terms with their relevant examples
   (a) Endemic disease
   (b) Pandemic
   (c) Prevalence
   (d) Incidence

2. Explain in details the strategies used by an Epidemiologist in the control of epidemics

3. An outbreak of cholera has been reported in a community with human population of 100,000. The number of infected individuals increased from 100 to 150 after two weeks. Calculate
   (a) The prevalence
   (b) The incidence

4. Discuss in a detail who is an Epidemiologist?

5. Write exhaustively on Nosocomial infection

6. A suspected case of Ebola disease has been reported to you as the chief Epidemiologist of your state. Explain in an orderly manner the steps you will take to stop further spread of the disease.

7. Write short notes on the following:

   (i) Opportunistic pathogens
   (ii) Reservoir

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2017/2018 SESSION
PRINCIPLES OF EPIDEMIOLOGY & PUBLIC HEALTH (MCB 414), 3UNITS

Instruction: Answer any five questions
Time: 2 Hours

8. Define the following terms with their relevant examples
   (e) Endemic disease
   (f) Pandemic
   (g) Prevalence
   (h) Incidence

9. Explain in details the strategies used by an Epidemiologist in the control of epidemics

10. An outbreak of cholera has been reported in a community with human population of 100,000. The number of infected individuals increased from 100 to 150 after two weeks. Calculate
    (c) The prevalence

(d) The incidence

11. Discuss in a detail who is an Epidemiologist?

12. Write exhaustively on Nosocomial infection

13. A suspected case of Ebola disease has been reported to you as the chief Epidemiologist of your state. Explain in an orderly manner the steps you will take to stop further spread of the disease.

14. Write short notes on the following:

(iii) Opportunistic pathogens
(iv) Reservoir

(v) FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
(vi) DEPARTMENT OF MICROBIOLOGY
(vii) FIRST SEMESTER EXAMINATION, 2017/2018 SESSION
(viii) SOIL MICROBIOLOGY (MCB 416), 3 Units
(ix)
(x) Instruction: Answer Question 1 and any other 4 Questions Time: 2 Hours
(xi)

(xii) 1. Describe methods you would use to carry out the microbial analysis of a given soil sample?
(xiii)
(xiv) 2a. Soil is believed to be a living system, with 2 specific but contrasting examples, describe how the dynamics of soil ecosystem relate with the interrelationship among the microbial species?
(xv) b. Differentiate between (i) biodegradation and bioremediation (ii) biostimulation and bioaugmentation
(xvi)
(xvii) 3a. In spite of the numerous advantages associated with bioremediation, it is not without its antecedent disadvantages. Mention 5 limitations associated with bioremediation
(xviii) b) The significance of bioindicators to determine soil health cannot be overemphasied. Outline 5 features that involve the use of microorganisms as indicators of soil quality
(xix)
(xx) 4a. Explain the role of microorganisms in pedogenesis.
(xxi) b. Highlight 5 advantages bioindicators have over traditional methods of indicating soil health.
(xxii)
(xxiii) 5a. Discuss the mechanism of biodegradation of n-alkanes by monooxygenase
(xxiv) b) Mention the role of soil organic matter in shaping soil microbial community.
(xxv)
(xxvi) 6a. Give reasons for a lower oxygen and a higher carbondioxide in soil compared with atmospheric air.

(xxvii) b. Name five factors influencing the number and activities of soil microorganisms?

(xxviii)

(xxix) 7. Soils are excellent culture media for the growth of many types of microorganisms, commend freely giving relevant examples.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATIONS, 2017/2018 SESSION
COURSE TITLE: PATHOGENIC BACTERIOLOGY
COURSE CODE: MCB 511 (3 UNITS)

Instruction: Answer any five (5) questions

Time: **$2^{1}/_{2}$ Hours**

1a. What are bacterial toxins?

1b. In a tabular form, compare and contrast the major classes of bacterial toxins.

2. Give a detailed explanation of the procedures for differentiating between members of the genera *Staphylococcus* and *Streptococcus*.

3a. Write a short note on the laboratory diagnosis of bacterial diseases.

3b. List the various methods employed in the diagnosis of bacterial diseases.

4a. Write a short note on bacterial structure.

4b. Mention at least five structures in a bacterial cell and the importance of each structure to the cell.

5. Discuss extensively the Gram's staining technique and state its significance in the clinical laboratory

6a. Discuss Normal Flora.

6b. Mention at least three importance and five examples of normal flora.

7. Write a very brief note on a named bacterial pathogen using the following heading:

(a) Name of bacterium
(b) Disease(s) Caused
(c) Means of transmission
(d) Mechanism of pathogenesis
(e) Prevention and control.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
MICROBIOLOGY DEPARTMENT
FIRST SEMESTER EXAMINATION
2017/2018 SESSION
COURSE TITLE: FERMENTATION TECHNOLOGY
COURSE CODE: MCB 512 (3 units)

INTRUCTIONS: Answer THREE questions in Section A and TWO questions in Section B. All Question carry equal marks

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

SECTION A

1. (a) (I) Define fermentation from microbiological point of view.
   (II) Mention typical examples of fermentation products
   (III) Name at least one microorganism that is responsible for the production of the following products
   (i) yogurt (ii) wine (iii) nail polish (iv) vinegar
   (b) Write short notes on the following:
   (i) Batch fermentation
   (ii) Baffles
   (iii) Spargers
   (iv) Growth media
   (v) Crude media
2. (a) Outline the procedures for the production of the following products in the laboratory
   (i) yogurt (ii) pickled cucumber (iii) beer
   (b) What is a fermenter?
3. (a) Draw a generalized schematic representation of a typical fermentation process.
   (b) Differentiate between single stage continuous fermentation and single stage recycle continuous fermentation.
4. (a) Materials used for designing a fermentor have some important functions. Discuss.
   (b) Explain why each and every industry that carryout fermentation process may face contamination problem.

SECTION B

5. (a) What is downstream processing? With the aid of a diagram summarised the major steps involve in the downstream processing.
   (b) Discuss vividly the last two steps in the downstream processing.
6. (a) Define balance growth and unbalance growth. Why do shift – up and shift – down Experiment cause cells to enter unbalance growth.
   (b) Why would cell that are vigorously growing when inoculated into fresh culture medium have a shorter lag phase than those that have been stored in a refrigerator?

7. (a) What are the principles behind the following purification techniques
   (i) Cell disruption
   (ii) Centrifugation
   (iii) Concentration
   (iv) Chromatography
   (v) Liquid – liquid extraction
   (b) List the two phases in chromatography.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATIONS, 2017/2018 SESSION
COURSE TITLE: GENERAL TOXICOLOGY
COURSE CODE: MCB 513 (3 UNITS)

Instruction: **Answer five questions, at least two in each section**
Time: **$2^{1}/_{2}$ Hours**

SECTION A

1. Write short notes on the following microorganisms:
   (i) *Escherichia coli*
   (ii) *Shigella dysentariae*
   (iii) *Staphylococcus aureus*
   (iv) *Streptococcus pyogens.*

2. Describe the following:
   (i) Pyrrophyceae (ii) Aflatoxins (iii) Trichothecenes
   (iv) *Corynebacterium diphtheria* (v) Sterigmatocystin.

3. a) Explain the mechanism of drug resistance
   b) In a tabular form differentiate between exotoxins and endotoxins

SECTION B

4. a) As an HSE officer, a report was brought to you on a sudden discharge of Arsenic in soil near to your locality. Describe two methods you will use to carry out *ex situ* or *in situ* bioremediation of the pollutant.
   b) State two advantages and two limitations of the use of bioremediation technology.

5. a) Describe two approaches in phytoremediation

   b) State two advantages and two limitations of the use of this technique

6. a) List four routes by which a toxic substances can enter the body

b) Giving relevant example each, differentiate between: (i) Biosorption and Bioaccumulation (ii) Food intoxication and food infection (iii) Biostimulation and bioaugmentation

7. Discuss five (5) effects of pesticides on soil microflora

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATION, 2017/2018 SESSION
COURSE TITLE: ANALYTICAL MICROBIOLOGY & QUALITY CONTROL
COURSE CODE: MCB 515 (2 units)

Instruction: Attempt two questions in section A and only one in section B
Time allowed: 1½ Hours

Section A

4. (a) Distinguish the following sampling techniques (7 marks)
   i. Food
   ii. Oil
   iii. Theoretical
   iv. Water and
   v. Work
   (b) Explain the relevance of the acronym HACCP in sampling (2 marks)
   (c) Discuss parametric values with respect to drinking water? (6 marks)

5. (a) Justify the establishment of NAFDAC as food safety monitoring agent (8 marks)
   (b) What is SON and what are its mandates? (7 marks)

6. (a) What is a standard? (2 marks)
   (b) List areas of work of World Health Organization and outline how it directs and coordinates authority on international health within the United Nations' system. (7 marks)
   (c) What factors affect microbiology tests? (6 marks)

Section B

4. State five advantages of Analytical Microbiology and instrumentation (05 marks)

(b) State five consequences of inefficient management of laboratory equipment (05 marks)

(c) Explain five ways of ensuring equipment safety in the laboratory (05 marks)

5. (a) State the functions of the following equipments:

(i) Autoclave (01 mark)

(ii) Oven (01 mark)

(iii) Bioscreen C Analyzer system (01 mark)

(b) How would you maintain two (2) of the equipment above in the laboratory (6 marks each)

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

FIRST SEMESTER EXAMINATION, 2017/2018 SESSION

COURSE: INTRODUCTION TO BIOTECHNOLOGY (MCB 516) 2 UNITS

INSTRUCTIONS: Answer **two Questions** in section A and **only one** in section B.

.**Time Allowed: 1 1/2 Hours**

SECTION A

7. (a) Define biological and physiological processes and list 5 of such processes in each case. (8 marks)
   (b) What is the relevance of methylisobutylketone in antibiotic production? (2 marks)
   (c) When is an azeotrope recognixed in product recovery? (2 marks)

8. (a) What is enzyme immobilization and why is it important in biotechnology? (5 marks)
   (b) Describe the methods used to break up cells in order to extract its content. (7 marks)
9. Outline how biotechnology has been applied to human endeavours. (12 marks)

SECTION B

10. (a) Define biotechnology (2 marks).
    (b) Write short notes on the following: (i) Blue biotechnology (ii) Green biotechnology (iii) Red biotechnology (iv) White biotechnology (10 marks).

11. (a) List the 3 basic steps use to genetically modify an organism. (6 marks).
    (b) Mention the key tools of recombinant DNA technology. (6 marks).

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATIONS 2017/2018 SESSION
COURSE TITLE: ENTREPRENEURSHIP
COURSE CODE: MCB 517 (2 UNITS)

INSTRUCTION: Answer only three Questions

TIME: 1 1/2 Hours

1a. Define Entrepreneurship (b) List the challenges in entrepreneurship that Microbiology graduates could face. Suggest various measures of overcoming these challenges

2a. Explain how you can make bread at home (b) As an entrepreneur, what measures would you take to prevent microbial contamination in the following business establishments: (i) Medical Laboratory (ii) Potable water factory.

3. Why would you encourage the federal government of Nigeria to establish a Microbiology Resource Centre in the Country?

4. There are numerous areas of waste to wealth programme in which microbes are involved. Discuss one area only, which is considered sustainable, environmental friendly and a support to agricultural productivity.

5. Discuss the future prospects of Entrepreneurial Microbiology in Nigeria.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2017/2018 SESSION
COURSE CODE: MCB 221 (INTRODUCTION TO MICROBIOLOGY II) UNIT: 3

INSTRUCTIONS: Answer FIVE Questions in all. Attempt at least two questions in each section.

TIME: $2^{1/2}$HOURS

SECTION A

1a. List and explain the elements of aseptic techniques

1b. Give five rules of any aseptic techniques.

2. Define the following:

i. Limiting factor
ii. Keystone species
iii. Trophic level
iv. Food chain

3. In a tabular form give the major roles of organisms in an ecosystem.

4a. Differentiate between symbiotic and non-symbiotic relationship.

4b. List and explain three kinds of microbial interaction with one example each.

SECTION B

5. Write short notes on any five of the following

i. Resolution
ii. Definition
iii. numerical aperture
iv. oil immersion objective
v. counter stain
vi. mordant
vii. fixatives

6a. What is the major difference between light microscope and electron microscope?

6b. Give three differential qualities and two examples each of gram-positive and gram-negative bacteria.

7a. What is the importance of staining in Microbiology?

7b. Explain the procedure of Gram's staining technique.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

SCHOOL OF LIFE SCIENCES

DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2017/2018 SESSION

GENERAL MICROBIOLOGY II (MCB321), 3 UNITS

Instructions: Answer any Five (5) questions in all. Attempt at least one question from each section.

Time: $2^{1/2}$ Hrs

Section A

Qn 1. Define the following: (i) Conjugation, (ii) Transformation, (iii) Transduction, (iv) Plasmid

Qn.2. Write short notes on the following: (i) Rennet, (ii) Industrial fermentation, (iii) How yoghurt is made.

Section B

Qn. 3. Highlight the various properties that enable pathogens to cause disease in a host.

b. Discuss the conditions that promote the establishment of human diseases by secondary pathogens.

Qn. 4a. Write short notes with examples on the following: (i) Mutualism (ii) Amensalism.

b Enumerate and discuss certain conditions that could influence the occurrence of an infection in a host.

Section C

Qn. 5a. Briefly describe the nitrogen cycle in nature.

b. Define the following terms. (i) Food spoilage (ii) Food borne illness (iii) Food borne intoxication (iv) Food borne infection.

c. Describe five techniques of food preservation.

Section D

Qn. 6. Explain the medical importance of the following:

(i) Opsonin, (ii) Interferon, (iii) Natural killer cells, (iv) Leukocidin, (v) C5a peptidase

Qn. 7. What roles do the following play in protecting the individuals?

(i) IgG, (ii) IgM, (iii) Precipitins, (iv) IgA, (v) Agglutinins

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2017/2018 SESSION
Course Code: MCB 323
Course Title: Microbial Physiology (3 Units)

Intruction: Answer 5 questions in all. Attempt at least 1 question in each section
Time: **$2^1/_2$ Hours**

SECTION A

1. How do the following contribute to generation of energy in bacterial cell?
   i. Coenzyme
   ii. Proton motive force (PMF)
   iii. ATP synthases (ATPase)
   iv. Oxygen atom

2a. Describe the structure of prokaryotic cell membrane.

2b. Explain five functions of prokaryotic cell membrane.

SECTION B

3. Discuss briefly the mechanisms of transport of materials across the membrane.

4. In a tabular form, differentiate between passive transport and active transport.

SECTION C

5a (i) Define microbial growth.

(ii) With the aid of diagrams, describe the prokaryotic cell cycle.

5b. (i) If a bacterial culture that contain 1×10^3 cells at the start of log phase divide every 60 minutes, how many bacterial cells will be there after 6hrs of exponential growth?

(ii) What is generation time?

6a. (i) What is water activity?

(ii) How do microorganisms adapt to hypotonic and hypertonic environment?

6b. (i) Discuss briefly how oligotrophic environment affect microbial activities.

(ii) How do microbial activities affect the pH of their environment and how can it be controlled when culturing in the laboratory?

7a. Classify microorganisms into five different groups on the basis of their temperature ranges for growth.

7b. Explain briefly how the temperature above the optimum growth temperature of an organisms affect its activities?

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2017/2018 SESSION
Course Code: MCB 324
Course Title: Microbiological Techniques

Intruction: Answer 5 questions in all. Attempt at least one question in each section
Time : $2^{1/2}$HOURS

Section A

12. (a) Make a well labeled diagram of a bacterial cell.

(b) Describe the following structures and their functions

i. flagella

ii. fimbriae

iii. pili

13. (a) Briefly discuss vitamins and suppliments

(c) List the B vitamins and their common names

14. (a) Discuss serology

(b) What are the uses of serological surveys?

Section B

15. (a) List and explain the factors affecting the growth of bacteria

(b) Discuss the basic nutrients required by bacteria for growth.

16. Classify any three (3) bacteria taxonomically from kingdom to specie.

Section C

17. List and discuss any six cultural characteristics used to identify a bacterial colony.

18. (a) As a microbiology student, highlight the importance of culture media, general purpose media, semi solid media and biochemical tests in a microbiology laboratory.

(b) Briefly outline any five arrangements of bacterial cells.

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SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATIONS, 2017/2018 SESSION
COURSE CODE: MCB 521 (3 UNITS)
COURSE TITLE: INTRODUCTION TO VIROLOGY

Instruction: **Answer any five (5) questions**

Time: **$2^{1}/_{2}$ Hours**

1. Briefly explain the methods used in cultivating viruses in the laboratory
2. Explain in details why diseases associated with viruses cannot be cured with antibiotics
3. (a) Giving specific examples, differentiate between DNA and RNA viruses
   (b) Explain why mutation rate is more with RNA viruses
4. Discuss the properties of viral particles
5. Write an essay on classification of viruses
6. Write short notes on the following
   (a) Lytic phase of viral replication
   (b) Lysogenic phase of viral replication
7. Explain the pathogenesis of Ebola virus disease

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF LIFE SCIENCES
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2017/2018 SESSION
COURSE CODE: MCB 522 (2 UNITS)
COURSE TITLE: PETROLEUM MICROBIOLOGY

Instruction: **Answer any three (3) questions in all.**
Time: **$1^{1}/_{2}$ Hours**

1. Discuss the microbiology of methanogenesis

2a). With the aid of schematic diagram describe the process of dissimilatory sulphate reduction.

b). Give two reasons why sulphate reducing bacteria are often detected only when fuel is heavily contaminated?

3a. Enumerate five factors each on: Causes, Effects, and Control of oil spills

b. Explain two methods in which oxygen can be supplied to microorganisms in oil contaminated site.

4a. Define biostimulation

b. With the aid of a diagram explain how the feasibility of bioremediation depends on the interactions between substrate and organisms in the environment?

5. Discuss how you would use hydrocarbonoclastic bacteria to search for oil and gas in the Niger Delta area of Nigeria.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
SECOND SEMESTER EXAMINATION, 2017/2018 SESSION
COURSE CODE: MCB 523
COURSE TITLE: ENVIRONMENTAL MICROBIOLOGY

Instructions: Answer 5 questions in all. Attempt at least one question in each section
Time Allowed: $2^1/_2$ Hours

SECTION A

1. Describe the sulphur and the carbon cycles and their economic importance?

2a) Describe the formation of soil and the microbial associations in the soil?

b) How will you isolate and characterise the microbial load of a soil sample?

SECTION B

3. Describe how you would carry out microbial assessment of the **AIR** in the laboratory?

4. Describe the microbiology of anaerobic digestion?

5. Write short notes on the under listed terms as they relate to secondary sewage treatment.

(i) oxidation pond

(ii) trickling filter

SECTION C

6a) What are Bio-pesticides?

b) List the types of Bio-pesticides

c) Write a comprehensive essay on advantages of Bio-pesticides

7a) Briefly describe the aquatic environment

b) Write short notes on lotic and lentic ecosystems

c) List the types of aquatic ecosystems

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2017/2018 SESSION

COURSE CODE: MCB 525 (3 UNITS)

COURSE TITLE: PHARMACEUTICAL MICROBIOLOGY

Instruction: **Answer five questions in all. Attempt at least two questions from each section**
Time: **$2^{1}/_{2}$ Hours**

19. (a) Describe the following terms:
    i. Antimicrobial agents
    ii. Antiseptics
    iii. Disinfectants
    iv. Chemotherapeutic agents

    (b) Enumerate some common preservatives added to processed foods

20. (a) Outline six (6) common antiseptics/disinfectants stating their actions and uses
    (b) Define antibiotics and categorize them based on types

21. (a) List five (5) forms of orthodox and herbal preparations. Also indicate five (5) ways of administering orthodox and herbal preparations.
    (b) Draw the skeletal representation of nalidixic acid

22. (a) Explain inherent (natural) resistance and acquired resistance.
    (b) Discuss in detail vertical evolution and horizontal gene transmission

Section B

23. (a) Differentiate between broad spectrum, narrow spectrum and limited spectrum
    (b) From the patient point of view, the most important property of an antimicrobial agent is its selective toxicity. Explain.
24. (a) Give examples, biological source and mode of action of the following classes of antibiotics
    i. ß-lactam antibiotics
    ii. Aminoglycosides
    iii. Glycopeptides
    iv. Macrolides
    v. Flouroquinones
    (b) Outline antibiotic susceptibility testing materials and explain any two.
    (c) What are the mechanisms of action of the following phytochemicals found in plants?
    i. Quinones
    ii. Lectins and polypeptides
    iii. Glycosides
    iv. Saponins

v. Steroids

7. (a) Differentiate between quality control, quality assurance and quality variation

(b) Write short notes on the following

i. Packaging control

ii. Production procedure control

iii. Distribution control

iv. Batch production record

v. Master formula record

vi. Manufacturing practice control

(c) Enumerate the factors that determine the rate of degradation of active ingredients in pharmaceutical products.

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

DEPARTMENT OF MICROBIOLOGY

SECOND SEMESTER EXAMINATION, 2017/2018 SESSION

COURSE CODE: MCB 525 (3 UNITS)

COURSE TITLE: PHARMACEUTICAL MICROBIOLOGY

Instruction: **Answer five questions in all. Attempt at least two questions from each section**
Time: **$2^{1}/_{2}$ Hours**

25. (a) Describe the following terms:

v. Antimicrobial agents

vi. Antiseptics

vii. Disinfectants

viii. Chemotherapeutic agents

(b) Enumerate some common preservatives added to processed foods

26. (a) Outline six (6) common antiseptics/disinfectants stating their actions and uses

(b) Define antibiotics and categorize them based on types

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