



The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)

Library Copy



Umanand Prasad School of Medicine and Health Sciences

2025

SUPPLEMENTARY EXAMINATION PAPER

MICR 202: HUMAN MICROBIOLOGY

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. This paper contains four (4) sections A, B, C and D. All questions are compulsory to answer **except** section A and D have choices.
6. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
7. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-50	Multiple Choice	50	70 minutes
B	51-60	Short Answer Questions	10	20 minutes
C	61-70	True/ False Questions	5	10 minutes
D	71-80	Matching Questions	5	10 minutes
E	81-87	Long Answer Questions	20	40 minutes
F	88-93	Essays (Choose Any ONE out of SIX questions)	10	30 minutes
		TOTAL	100	180 Minutes

SECTION A: MULTIPLE CHOICE (50 Marks)

(Circle the letter of your answer in the answer grid provided)

1. The epidemiological triad consists of
 - a. Host, vector, drug
 - b. Agent, drug, vector
 - c. Agent, host, environment
 - d. Pathogen, vaccine, host
2. Which of the following is a mode of pathogen exit?
 - a. Host immunity
 - b. Vaccination
 - c. Skin lesions
 - d. Antibiotic therapy
3. Prokaryotic cells differ from eukaryotic cells by
 - a. Presence of linear DNA
 - b. Lack of membrane-bound organelles
 - c. Presence of nucleus
 - d. Presence of mitochondria
4. An example of a prokaryotic organism is
 - a. *Plasmodium falciparum*
 - b. *Saccharomyces cerevisiae*
 - c. *Escherichia coli*
 - d. *Candida albicans*
5. Gram-positive bacteria have
 - a. High lipid content
 - b. Outer membrane
 - c. Thin peptidoglycan layer
 - d. Thick peptidoglycan layer
6. An example of a Gram-negative bacterium is
 - a. *Bacillus anthracis*
 - b. *Neisseria gonorrhoeae*
 - c. *Staphylococcus aureus*
 - d. *Streptococcus pyogenes*

7. The objective lens of a microscope is closest to

- a. The specimen
- b. The eyepiece
- c. The condenser
- d. The light source

8. The primary stain in Gram staining is

- a. Methylene blue
- b. Safranin
- c. Iodine
- d. Crystal violet

9. A live attenuated vaccine example is

- a. Rabies vaccine
- b. Tetanus toxoid
- c. Hepatitis B vaccine
- d. Measles vaccine

10. The Fiji vaccination schedule includes

- a. BCG at birth
- b. Covid 19 at 10 years
- c. HPV at birth
- d. Rabies at 6 months

11. The Ziehl-Neelsen stain is used to identify

- a. Escherichia coli
- b. Mycobacterium tuberculosis
- c. Staphylococcus aureus
- d. Candida albicans

12. Endospores are produced by

- a. Bacillus and Clostridium
- b. Streptococcus and Staphylococcus
- c. Neisseria and Escherichia
- d. Mycoplasma and Rickettsia

13. Capsules in bacteria primarily function to

- a. Produce toxins
- b. Aid protein synthesis
- c. Resist phagocytosis
- d. Facilitate DNA replication

14. Flagella provide

- a. Adhesion
- b. Resistance
- c. Motility
- d. Sporulation

15. Fimbriae are important for

- a. Attachment
- b. Motility
- c. Sporulation
- d. Protein synthesis

16. Mycoplasma species lack

- a. Plasma membrane
- b. DNA
- c. Ribosomes
- d. Cell wall

17. Streptococcus pneumoniae is a common cause of

- a. Malaria
- b. Pneumonia
- c. Tuberculosis
- d. Rabies

18. Neisseria gonorrhoeae is transmitted via

- a. Faecal-oral route
- b. Airborne droplets
- c. Sexual contact
- d. Vector bites

19. Salmonella enterica causes

- a. Oral thrush
- b. Typhoid fever
- c. Botulism
- d. Toxic Shock Syndrome

20. Clostridium tetani produces

- a. Tetanospasmin toxin
- b. Endotoxin
- c. Exotoxin A
- d. Botulism toxin

21. The first antibody produced in primary infection is

- a. IgA
- b. IgE
- c. IgG
- d. IgM

22. The dominant antibody in secondary infection is

- a. IgA
- b. IgE
- c. IgG
- d. IgM

23. IgA is primarily found in

- a. Blood plasma
- b. Synovial fluid
- c. Mucosal secretions
- d. Cerebrospinal fluid

24. IgE is associated with

- a. Allergic reactions
- b. Complement activation
- c. Opsonization
- d. Neutralization

25. Complement opsonization enhances

- a. Phagocytosis
- b. DNA replication
- c. Protein synthesis
- d. Antibody production

26. The membrane attack complex (MAC) causes

- a. Cytokine transcription
- b. Antibody production
- c. Cell lysis
- d. DNA replication

27. Natural killer (NK) cells are part of

- a. Adaptive immunity
- b. Artificial immunity
- c. Passive immunity
- d. Innate immunity

28. T helper cells (CD4+) function to

- a. Kill infected cells directly
- b. Activate B cells
- c. Produce antibodies
- d. Form MAC (Membrane Attack Complex)

29. Cytotoxic T cells (CD8+) function to

- a. Activate B cells
- b. Produce antibodies
- c. Kill virus-infected cells
- d. Enhance phagocytosis

30. Memory cells provide

- a. Immediate innate response
- b. Complement activation
- c. Passive immunity
- d. Long-term immunity

31. Influenza virus belongs to

- a. Orthomyxoviridae
- b. Paramyxoviridae
- c. Poxviridae
- d. Retroviridae

32. Hepatitis B virus is a

- a. DNA virus
- b. RNA virus
- c. Retrovirus
- d. Prion

33. Hepatitis C virus is a

- a. DNA virus
- b. Retrovirus
- c. Prion
- d. RNA virus

34. Poliovirus belongs to

- a. Orthomyxoviridae
- b. Paramyxoviridae
- c. Picornaviridae
- d. Retroviridae

35. Dengue virus is transmitted by

- a. Sandflies
- b. Aedes mosquitoes
- c. Anopheles mosquitoes
- d. Tsetse flies

36. Zika virus is an example of

- a. Retrovirus
- b. Arbovirus
- c. Orthomyxovirus
- d. Prion

37. Rotavirus is a common cause of

- a. Pneumonia
- b. Sepsis
- c. Meningitis
- d. Diarrhea

38. Human immunodeficiency virus (HIV) targets

- a. CD4⁺ T cells
- b. CD8⁺ T cells
- c. B cells
- d. NK cells

39. Rabies virus belongs to

- a. Orthomyxoviridae
- b. Paramyxoviridae
- c. Retroviridae
- d. Rhabdoviridae

40. Measles virus is transmitted via

- a. Vector bites
- b. Faecal-oral route
- c. Respiratory droplets
- d. Sexual contact

41. Cryptococcus neoformans is associated with

- a. Oral thrush
- b. Athlete's foot
- c. Tinea corporis
- d. Meningitis in immunocompromised patients

42. *Histoplasma capsulatum* infection is acquired via

- a. Sexual contact
- b. Vector bites
- c. Faecal-oral route
- d. Inhalation of spores

43. Dermatophytes cause

- a. Meningitis
- b. Pneumonia
- c. Ringworm
- d. Thrush

44. *Candida albicans* is classified as

- a. Mold
- b. Yeast
- c. Protozoa
- d. Virus

45. *Aspergillus* species are classified as

- a. Yeasts
- b. Protozoa
- c. Molds
- d. Viruses

46. *Pneumocystis jirovecii* causes

- a. Pneumonia in HIV patients
- b. Malaria
- c. Walking Tuberculosis
- d. Meningitis

47. Beta-lactam antibiotics target

- a. Protein synthesis
- b. DNA replication
- c. Cell wall synthesis
- d. RNA transcription

48. Aminoglycosides target

- a. DNA replication
- b. RNA transcription
- c. Protein synthesis
- d. Cell wall synthesis

49. Fluoroquinolones target

- a. DNA gyrase
- b. Ribosomes
- c. Cell wall
- d. RNA polymerase

50. Multidrug resistance (MDR) in tuberculosis is defined as resistance to

- a. Vancomycin and erythromycin
- b. Penicillin and tetracycline
- c. Isoniazid and rifampicin
- d. Ciprofloxacin and gentamicin

Answer Sections B, C and D in the answer booklet provided.

SECTION B: SHORT ANSWER QUESTIONS (10 Marks)

51. Using the gram stain and microscopy, how would you differentiate between *Streptococcus pneumoniae* and *Neisseria gonorrhoea*? (1 Mark)
52. What diagnostic characteristics would enable you to differentiate between an infection with *Mycoplasma pneumoniae* and *Mycobacterium tuberculosis*? (1 Mark)
53. Name one Gram negative organism and one gram positive organism commonly associated with urinary tract infection in females? (1 Mark)
54. Name two organisms capable of causing toxic shock syndrome. (1 Mark)
55. Name two organisms that can cause toxin mediated food-borne illness. (1 Mark)
56. Name two diseases caused by prions. (1 Mark)
57. Name two diagnostics tests which use the principle of antibody/ antigen based reactions. (1 Mark)
58. Mention two end results of the complement cascade. (1 Mark)
59. Give one example of Natural Active Immunity and one example of Artificial Active Immunity. (1 Mark)
60. Give one example of Natural Passive Immunity and one example of Artificial Passive Immunity. (1 Mark)

SECTION C: TRUE/ FALSE (5 Marks)

Indicate whether each statement below is True or False. Each question is ½ Mark.

- 61. Gram-negative bacteria have an outer membrane.
- 62. Viruses are considered living organisms.
- 63. Rabies is transmitted through saliva of infected animals.
- 64. Prions contain nucleic acids.
- 65. HIV is a retrovirus.
- 66. Vaccines can be live attenuated or killed.
- 67. Fungi are prokaryotic organisms.
- 68. Endemic diseases occur worldwide.
- 69. Antibiotic resistance can be plasmid-mediated.
- 70. Specimen transport requires clean containers.

SECTION D: MATCHING

Matching Questions: Match the pathogen with the disease (5 Marks)

Pathogen	Correct Option	Disease Options
71. Streptococcus pyogenes		A. Syphilis
72. Mycobacterium tuberculosis		B. Smallpox
73. Candida albicans		C. Cervical cancer
74. Clostridium botulinum		D. Chronic lower respiratory infection
75. Variola virus		E. Thrush
76. Human papillomavirus		F. Rheumatic fever
77. Monkeypox virus		G. Toxic Shock Syndrome
78. Escherichia coli		H. Food poisoning (canned foods)
79. Treponema pallidum		I. Zoonotic pox infection
80. Staphylococcus aureus		J. Hemolytic uremic syndrome

SECTION E: LONG ANSWER QUESTIONS (20 Marks)

81. Define the epidemiological triad and explain its importance in disease transmission.
(3 marks)
82. List three outcomes of complement activation. (3 Marks)
83. Differentiate infection from toxemia. (2 Marks)
84. Define nosocomial infections and give two examples of nosocomial infections.
(2 Marks)
85. Based on your knowledge of microorganism structures, summarise why antibiotics cannot be used for viral, fungal, protozoan and helminthic infections.
(3 Marks)
86. Define hypersensitivity reaction and provide two clinical examples using any Type.
(3 Marks)
87. Using a clinical presentation of your choice, describe how you would collect the appropriate sample(s) for diagnostic tests and to help with differential diagnosis/confirmation of your suspicions of infective aetiology.
(4 Marks)

SECTION F: ESSAY QUESTIONS (10 Marks)

You have a choice to answer any **One** out of **six** (1/6) questions. Each question is worth 10 Marks.

88. Using examples, analyse the clinical importance of distinguishing natural vs artificial immunity in patient care.
89. Evaluate diagnostic microbiology in identifying pathogens and guiding therapy.
90. Compare immunological diagnostic markers in acute primary, acute secondary, and convalescent phases.
91. Analyse the global challenge of antibiotic resistance and strategies to combat superbugs.
92. Discuss the role of bacterial toxins in diseases such as toxic shock syndrome and hemolytic uremic syndrome. You may use other examples as appropriate.
93. Evaluate the importance of sterilisation, antisepsis, and disinfection in preventing hospital-acquired infections.

