



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF HEALTH SCIENCES

DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH

SECOND YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (PUBLIC HEALTH)

HPH 204: MICROBIOLOGY

DATE: 16/8/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS:

This paper consists of two sections A and B

SECTION A

Specific Instructions

- This section has one question
- The question is compulsory
- The question is 30 marks

QUESTION ONE (COMPULSORY) (30 MARKS)

- Outline the differences between prokaryotic and eukaryotic cells. (3 marks)
- Explain the classification of bacteria based on energy source. (3 marks)
- Explain the importance of microbiology in the following fields;- (3 marks)
 - Public Health
 - Medical Industry
- Outline the economic importance of protozoa. (3 marks)
- Highlight the importance of sorting materials before the process of sterilization. (3 marks)
- Explain the use of three domain in broad classification of microorganisms. (3 marks)

- g) Outline factors that affect efficacy of chemical disinfectants. (3 marks)
- h) State measures that can be put in place to minimize the risk of accidents during doffing and donning of personal protective equipment. (3 marks)
- i) Using examples, explain how fungi contributes to disease in humans. (3 marks)
- j) How does the body protect itself against invasion by potential microorganisms? (3 marks)

SECTION B:

Specific Instructions

- **This section has four (4) questions**
- **Answer any two (2) questions**
- **Each question is 20 marks**

QUESTION TWO (20 MARKS)

- a) You are working on a class presentation about media culture ingredients. Discuss the content of your presentation. (10 marks)
- b) Using examples, explain factors that affect microbes biodegradation. (10 marks)

QUESTION THREE (20 MARKS)

- a) You are attached to industry X that is involved in antibiotic production. Describe the bioreactors for solid-substrate fermentations that you are likely to find in the premises. (10 marks)
- b) As a public health officer explain the various methods of heat sterilization. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the principle action of the following biochemical tests:
- i. Catalase test (5 marks)
 - ii. Urease test (5 marks)
- b) Describe biogeochemical cycles that affect human life. (10 marks)

QUESTION FIVE (20 MARKS)

- a) Grace visits hospital X, the Doctor suspects a respiratory infection, her sputum sample is collected for staining and she tests positive for *Streptococcus pneumoniae*. Explain the staining techniques that were used in identification of the microorganism affecting Grace. (10 marks)
- b) Company X is setting up a microbiology laboratory and they are in the process of purchasing biological cabinets. Discuss the factors that the company should consider. (10 marks)