



KENYATTA UNIVERSITY

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL

LABORATORY SCIENCE

HML 117: BASIC BACTERIOLOGY

2ND SEMESTER 2021/2022

TIME: 2 HOURS

INSTRUCTIONS:

SECTION A: Answer all the questions (4 marks each)

1. State the medical importance of plasmids. (4 marks)
2. Explain the principle of Urease test. (4 marks)
3. Differentiate between disinfection and sterilization. (4 marks)
4. Differentiate between gram negative and gram-positive cell wall. (4 marks)
5. Classify bacterial spores. (4 marks)

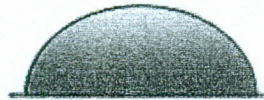
SECTION B: Answer ONE Question (20 marks)

6. Describe triple sugar iron agar under the following;
 - a) Test results interpretation (8 marks)
 - b) Principle (12 marks)
7. Describe the special media for bacterial culture. (20 marks)

SECTION C: Answer all the questions on the Answer booklet (0.5 mark each)

1. Microorganisms that grow at 20°C to 40°C are known as:
 - a) Psychrophiles
 - b) Mesophiles
 - c) Thermophiles
 - d) hyperthermophiles

2. Which of the following is an obligate intracellular parasite?
- a) *Chlamydia*
 - b) *Escherichia coli*
 - c) *Klebsiella pneumonia*
 - d) *Proteus mirabilis*
3. Several bacteria that form spores are important human pathogens. Which one of the following is the most accurate statement about bacterial spores?
- a) They are killed by boiling for 15 minutes.
 - b) They are formed primarily when the bacterium is exposed to antibiotics.
 - c) They are produced by anaerobes only in the presence of oxygen.
 - d) They are metabolically inactive yet can survive for years in that inactive state
4. Which one of the following chemicals is used to sterilize heat-sensitive materials, such as surgical instruments, in the hospital?
- a) Benzalkonium chloride
 - b) Cresol (Lysol)
 - c) Ethylene oxide
 - d) Tincture of iodine
5. Name the type of colonial morphology demonstrated below;



- a) Umbonate
 - b) Raised
 - c) Undulate
 - d) Convex
6. All of the following are spore-forming bacteria except:
- a) *Vibrio cholerae*
 - b) *Clostridium botulinum*
 - c) *Bacillus anthracis*
 - d) *Bacillus subtilis*

- ne bacteria are obligate anaerobes. Which of the following statements best explains this phenomenon?
- a) They can produce energy both by fermentation (i.e., glycolysis) and by respiration using the Krebs cycle and cytochromes.
 - b) They cannot produce their own ATP.
 - c) They do not form spores.
 - d) They lack superoxide dismutase and catalase.
8. Generation time for *Mycobacterium tuberculosis* is:
- a) 20 seconds
 - b) 20 minutes
 - c) 20 hours
9. Which of the following is gram-negative coccus?
- a) *Staphylococcus aureus*
 - b) *Salmonella typhi*
 - c) *Neisseria gonorrhoeae*
 - d) *Escherichia coli*
10. Bacteria that cause nosocomial (hospital-acquired) infections often produce extracellular substances that allow them to stick firmly to medical devices, such as intravenous catheters. Which one of the following is the name of this extracellular substance?
- a) Endotoxin
 - b) Flagella
 - c) Glycocalyx
 - d) Porin
11. Human pathogen that does not fulfill the Koch's postulates criteria is:
- a) *Mycobacterium leprae*
 - b) *Staphylococcus aureus*
 - c) *Bacillus anthracis*
 - d) *Mycobacterium tuberculosis*
12. The following are methyl red test positive, except?
- a) *E. coli*
 - b) *Klebsiella* spp.
 - c) *Shigella* spp.
 - d) *Edwardsiella* spp.

13. In the process of studying how bacteria cause disease, it was found that a pathogenic strain failed to form a capsule. Which one of the following statements is most accurate in regard to this unencapsulated mutant strain?
- a) It was nonpathogenic primarily because it was easily phagocytized.
 - b) It was nonpathogenic primarily because it could not invade tissue.
 - c) It was highly pathogenic because it could secrete larger amounts of exotoxin.
 - d) It was highly pathogenic because it could secrete larger amounts of endotoxin.
14. Who is the father of bacteriology?
- a) Louis Pasteur
 - b) Robert Koch
 - c) Paul Ehrlich
 - d) Joseph Lister
15. Regarding sterilization and disinfection, which one of the following is the most accurate statement?
- a) Disinfectants kill both bacterial cells and bacterial spores.
 - b) During sterilization by autoclaving, the temperature must be raised above boiling in order to kill bacterial spores.
 - c) Transmission of milk-borne diseases can be prevented by pasteurization, which kills both bacterial cells and spores.
 - d) Ultraviolet light used in the operating room to disinfect the room kills bacteria primarily by causing oxidation of lipids in the cell membrane
16. Identify bacteria that show the following morphology;



- a) *Streptococcus pneumonia*
 - b) *Neisseria meningitidis*
 - c) *Neisseria gonorrhoeae*
 - d) *Moraxella catarrhalis*
17. The sterilization at 63°C for 30 minutes is referred as:
- a) Ultra high temperature pasteurization
 - b) Flash method pasteurization
 - c) Holder method pasteurization
 - d) autoclaving

A tuft of flagella present at one or both the ends of bacterial cell is known as:

- a) Monotrichous
- b) Amphitrichous
- c) Lophotrichous
- d) Peritrichous

19. In the Gram stain procedure, bacteria are exposed to 95% alcohol or to an acetone/alcohol mixture. The purpose of this step is:

- a) to adhere the cells to the slide
- b) to retain the purple dye within all the bacteria
- c) to disrupt the outer cell membrane so the purple dye can leave the bacteria
- d) to form a complex with the iodine solution

20. The father of immunology is:

- a) Louis Pasteur
- b) Edward Jenner
- c) Robert Koch
- d) Paul Ehrlich