

CHUKA



UNIVERSITY

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**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF  
BACHELOR OF SCIENCE IN NURSING**

**NURS 223: MEDICAL MICROBIOLOGY**

**STREAMS: BSC (NURS) Y2S1**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 03/12/2019**

**8.30 AM – 10.30 AM**

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**INSTRUCTIONS:**

- **Do not write anything on the question paper**
- **Mobile phones and any other reference materials are not allowed in the examination room**
- **The paper has three sections. Answer all questions**
- **All your answers for section 1 should be on page 1**
- **Number all your answers and indicate the order of appearance in the space provided in the cover page of exam answer booklet.**

**SECTION A MULTIPLE CHOICE QUESTIONS (35 MARKS)**

1. Karuru had a deep wound which had started changing colour to show flourishing green pigment. The wound is most likely infected with; (1 mark)
  - a.a) Salmonella typhi
  - a.b) Staphylococcus epidermidis
  - a.c) Pseudomonas aeruginosa
  - a.d) Pseudomonas Putida
2. Robert Koch was working on -----organism when he came up with the 4 postulates. (1 mark)
  - a.a) Staphylococcus aureus
  - a.b) Bacillus anthracis
  - a.c) Treponema species
  - a.d) Streptococcus perfringens
3. Bacteria may be identified according to their shape. Which of the following corresponds

4. with the shape of the organism that causes Neisseria Gonorrhoea? (1 mark)
- a) Streptococcus
  - b) Spirilla
  - c) Diplococcus
  - d) Bacillus
5. To colonize the human system and cause diseases micro-organisms multiply in multiples of (1 mark)
- a) 4
  - b) 2
  - c) 3
  - d) 8
6. A characteristic of Cephalosporins is that they? (1 mark)
- a) Affects protozoal metabolism
  - b) Affects fungal nucleic acid synthesis
  - c) Inhibits cell wall synthesis
  - d) Inhibits RNA Synthesis
7. Which of the following is true about Acid fast Bacilli? (1 mark)
- a) Cell wall with mycolic acid
  - b) Exotoxin production
  - c) Skin infections that can lead to septicaemia
  - d) Diseases that come in stages
8. Answer True or false. Warm moist conditions favor the transmission of respiratory fungal disease. (1/2 mark)
- a.a.True
  - a.b.False
9. Interferon has an innate ability to fight viral infections and is always circulating in the body (1/2 mark)
- a.a.True
  - a.b.False
10. Meningitis is an infection of? (1 mark)
- a.a.The peripheral Nervous system
  - a.b.The spinal cord and the brain
  - a.c.The covering of the spinal cord and brain
  - a.d.The blood brain barrier
11. Pandemic refers to? (1 mark)
- a) Worldwide outbreak of disease
  - b) Disease outbreak
  - c) Disease that is easily spread
  - d) Vector of infection

12. Why are pseudomonas infections difficult to treat and prevent? (1 mark)

- a) The bacteria is highly resistant to detergents and antibiotics
- b) Metabolically versatile
- c) It is found everywhere
- d) Causes nosocomial infections

13. Why do you think that antibiotics such as penicillin cannot be used with bacteria like mycobacterium tuberculosis, the causative agent of TB? (1 mark)

- a.a. The cell walls of these organisms are not affected by penicillin
- a.b. The spores that are produced by TB cannot be killed by antibiotics
- a.c. The bacterium encysts within the body and cannot be killed with penicillin
- a.d. The bacterium is gram negative which are not killed as easily with Penicillin

14. What is one of the biggest problems in preventing the spread of Gonorrhoeal and chlamydia? (1 mark)

- a.a. People hate condoms
- a.b. It is mainly spread by young irresponsible teenagers
- a.c. Asymptomatic people do not realize they have it
- a.d. Highly antibiotic resistant

15. Mumps is a viral infection that affects what part of the body? (1 mark)

- a.a. My humps
- a.b. The ears
- a.c. The reproductive organs
- a.d. The parotid glands

16. Select the correct sequence of activities in the progression of Mycobacterium Tuberculosis (1 mark)

- a.A. Macrophage attack bacteria
- a.B. Bacteria spread through the rest of the body
- a.C. Bacteria multiply within macrophage which form granuloma
- a.D. Inhalation of bacteria
- a.E. Macrophage form tuberculosis

Choices

- a.a. EDCBA
- a.b. DBCAE
- a.c. DACEB
- a.d. DECAB

17. Whitish discharge in vaginal infections may be a result of (1 mark)

- a.i.a. Gonorrhoea
- a.i.b. Candida albicans
- a.i.c. Aspergillus Niger
- a.i.d. Molds

18. An experiment began with 4 cells and ended with 128 cells. How many generations did the cells go through? (1 mark)

- a.a. 64
- a.b. 32
- a.c. 6
- a.d. 5

19. Sterilization is defined as (1 mark)

- a.a. Removal of microbial contamination
- a.b. Complete destruction of all forms of life
- a.c. Complete removal of vegetative cells
- a.d. Removal of most micro-organisms

20. A 45 years old construction site worker receives a deep puncture wound from a piece of sheet sticking out of the ground. The wound does not seem to be that bad and is not bleeding very much. Two days later, the wound is sore and red and patient is having muscle cramps in legs, neck, back and arms. What advice would you give the person? (1 mark)

- a.a. Move quickly in an emergency room for tetanus treatment
- a.b. Emergency room for gangrene treatment
- a.c. Go for wound cleaning and may be stitches
- a.d. Take some antibiotics and rest for 1 day

21. Jenny, a 22-year-old mother of two was at work and collapsed. She had been complaining of having periodic like symptoms with pain and cramping along with fever, headache and rashes. Doctors did a spinal tap and the fluid came out clear with no signs of Diplococcus. Jenny was rapidly deteriorating and experienced multi organ shut down. Multiple antibiotics were given and she recovered in 6 weeks total, but with a permanent kidney damage. Jenny was most likely experiencing. (1 mark)

- a.a. Scalded skin syndrome from staphylococcus aureus
- a.b. Folliculitis followed by septicemia from staphylococcus aureus
- a.c. Staphylococcus aureus toxic shock syndrome
- a.d. Anthrax

22. How are gram positive and gram-negative cell walls different? (1 mark)

- a) Gram negative cells have a single layer of peptidoglycan and an outer membrane and gram-positive cells have a thick layer with teichoic acids
- b) Gram positive cells have a single peptidoglycan and a periplasmic space while gram negative cells have a thick layer with teichoic acid
- c) Gram negative cell walls have a thick layer of peptidoglycan and gram-positive cells have no peptidoglycan but have teichoic and mycolic acids
- d) Gram positive and gram-negative bacteria take the crystal violet colour because of their peptidoglycan layers.

23. Most fungi grow best with oxygen, at room temperature and under -----conditions. (1 mark)

- a) Slightly acidic conditions
- b) Slightly basic conditions
- c) Neutral Ph
- d) Dark environment

24. Hemorrhagic viruses often kill by what mechanism? (1 mark)

- a) Systemic shock
- b) Dehydration
- c) Bleeding to death
- d) Pneumoniae

25. Each of the following statements concerning the Gram stain is correct except: (1 mark)

- a.a. Escherichia coli stains pink because it has a thin peptidoglycan layer
- a.b. Streptococcus pyogenes stains blue because it has a thick peptidoglycan layer
- a.c. Mycoplasma pneumoniae is not visible in the Gram's stain because it does not have a cell wall
- a.d. Mycobacterium tuberculosis stains blue because it has a thick lipid layer

26. Each of the following organisms is an important cause of urinary tract infections except: (1 mark)

- a) Klebsiella pneumoniae
- b) Escherichia coli
- c) Bacteriodes fragilis
- d) Proteus mirabilis

27. Each of the following statements about the classification of streptococci is correct except (1 mark)

- a) Pneumococci (Streptococcus pneumoniae) are alpha-haemolytic and can be serotyped on the basis of their polysaccharide capsule
- b) Enterococci are group D streptococci and can be classified by their ability to grow 6.5% sodium chloride
- c) Viridans streptococci are identified by Lancefield grouping, which is based on the C carbohydrate in the cell wall
- d) Although pneumococci and the viridans streptococci are alpha-haemolytic, they can be differentiated by the bile solubility test and their susceptibility to optochin

28. An outbreak of sepsis caused by Staphylococcus aureus has occurred in the newborn nursery. You are called upon to investigate. According to your knowledge of the normal flora, what is the most likely source of the organism? (1 mark)

- a.a. Nose
- a.b. Colon
- a.c. Hand
- a.d. Throat

29. Nosocomial infections can be termed as (1 mark)

- a.a. Community acquired infections
- a.b. Hospital acquired infections
- a.c. Infectious diseases from the public sector

a.d.Environmental acquired infections

30. Gakeni is a mother 29 years old. She comes to the clinic with history of miscarriages. A High Vaginal swab culture on blood agar culture medium revealed a whitish colony with hemolysis on the culture medium. Which organism could this possibly be: (1 mark)
- a) Alpha hemolytic streptococcus viridans
  - b) Beta hemolytic staphylococcus aureus
  - c) Group B Beta Hemolytic streptococcus agalactiae
  - d) Beta hemolytic streptococcus pyogenis
31. All the following antibiotics are broad spectrum except (1 mark)
- a.a.Cotrimoxazole
  - a.b.Ciprofloxacin
  - a.c.Vancomycin
  - a.d.Chloramphenicol
32. Chocolate agar is an example of pure enriched medium used for culturing (1 mark)
- a) Hemophilus influenzae
  - b) Enterococcus
  - c) Candida albicans
  - d) Salmonella species
33. Lowenstein-Jensen medium is used for culturing: (1 mark)
- a) Enterobacteria
  - b) Tuberculosis
  - c) Salmonella
  - d) Eubacteria
34. Emergence of multi-drug resistant strains of bacteria could be a result of the following except one; (1 mark)
- a) Drug sale over the counter
  - b) Increased use of unprescribed antibiotics
  - c) Gene mutation
  - d) Doctors prescribing antibiotics
35. Contaminated clothing after a surgical procedure may be rendered completely free of microbial contamination through; (1 mark)
- a) Fumigation
  - b) Burning on a Bunsen flame
  - c) Autoclaving
  - d) Disposing in the pit
36. Which of the following is used for culturing salmonella? (1 mark)
- a) Saboroud dextrose agar
  - b) MacConkey agar
  - c) Blood agar

d) Lowenstein -Jensen medium

37. Bacteria that is known to be a major cause of Boils and cellulitis (1 mark)

- a) Staphylococcus aureus
- b) Streptococcus Pneumoniae
- c) Salmonella typhi
- d) Vibrio cholerae

**SECTION B SHORT ANSWER QUESTIONS (25 Marks)**

- 1. Describe beneficial effects of normal flora. (5marks)
- 2. Briefly describe three outcomes following microbial entry into a human body. (3 Marks)
- 3. Differentiate between the term's pathogenicity and virulence (4 marks)
- 4. Describe four types of bacterial exotoxins. (4 marks)
- 5. Discuss differences between gram positive and gram-negative bacteria (4 Marks)
- 6. 6. Outline five types antifungal agents. (5 marks)

**SECTION C LONG ANSWER QUESTIONS (40 MARKS)**

- 1. Micro-organisms may be identified in terms of their oxygen requirements. Giving examples discuss the statement: (8 marks)
  - 2. Nosocomial infections are a major cause of deaths in developing countries. Giving possible sources of these infections, discuss the statement. (6 Marks)
  - 3. Discuss ways through which micro-organisms manage to evade the immune system and cause disease in man. (6marks)
  - 4. Describe four types of sterilization methods. (8 marks)
  - 5. Human immunodeficiency virus (HIV) infects a human body and renders the immune system incompetent. Discuss the statement. (8 Marks)
  - 6. Describe procedure for preparation of KOH for identification of antifungal agents. (4 Marks)
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