



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

Faculty of Applied & Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

DIPLOMA IN PHARMACEUTICAL TECHNOLOGY

ADM 2162: MEDICAL MICROBIOLOGY

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2011

TIME: 3 HOURS

Instructions to Candidates:

You should have the following for this examination

This paper contains of section A, B and C. Answer all questions in section A by circling the right answer, all questions in section B and any other TWO questions from section C in the booklet provided.

This paper consist of **SEVEN** printed pages

SECTION A (30 marks – Multiple choice questions, choose the correct answer)

1. Beta-lactamase producing pathogens are resistant to:
 - A. Tetracycline and vancomycin
 - B. Penicillin and cephalosporin
 - C. Erythromycin and clarithromycin
 - D. Gentamycin and co-trimoxazole

2. Endo-spore stain is an example of:
 - A. Differential stain
 - B. Selective stain
 - C. Structural stain
 - D. Negative stain

3. The major immunologic manifestation found in diagnosed HIV patients is:
 - A. Loss of neutrophil functions
 - B. Suppression of humoral immunity
 - C. Suppression of cellular immunity
 - D. Demonstration of antinuclear antibodies

4. The stage of growth of a bacterial culture during which it establishes itself is known as:
 - A. Stationary phase
 - B. Decline phase
 - C. Lag phase
 - D. Exponential phase

5. The following is not true of agar in culture media
 - A. Enable media solidification
 - B. Enable incubation of thermophilic pathogens
 - C. Enable addition of heat sensitive supplements to media
 - D. Enable determination of motility of pathogens

6. A biological method used in the sterility check in autoclave is,
 - A. Use of autoclave tape
 - B. Use of *Bacillus stearothermophilus* spore
 - C. Use of browne's tubes
 - D. Use of *Bacillus stearothermophilus* vegetative cells

7. In gram staining Lugol's iodine is used as;
 - A. Mordant
 - B. Dye
 - C. Counter stain
 - D. Discolourizer

8. The following are anaerobic gram negative bacteria except
 - A. *Propionibacterium*
 - B. *Bacteroides*
 - C. *Fusobacterium*
 - D. *Provetella*

- E. Prophyromanas
9. Most of the pathogenic bacteria falls into the group of:
- A. Psychrophiles
 - B. Thermophiles
 - C. Mesophiles
 - D. Thermodurics
10. The following are examples of systematic mycoses EXCEPT;
- A. Tinea
 - B. Aspergillosis
 - C. Cryptococcosis
 - D. Histoplasmosis
11. Viral cell trophism is its ability to:
- A. Replicate in particular cells
 - B. Cause cell damage
 - C. Cause cell immune response
 - D. Move towards a cell.
12. Coenocytic fungi
- A. Have septa
 - B. Have no cross-walled divisions
 - C. Have aerial mycelium
 - D. Always unicellular in form
13. Blood agar is a differential medium because.
- A. It has an inhibitory substance in it
 - B. Used by many pathogenic bacteria
 - C. It has an indicator substance in it
 - D. None of the above
14. Toxic shock syndrome is associated with:
- A. Extracellular enzyme production
 - B. Exotoxin production
 - C. Endotoxin production
 - D. Inter-cellular toxin production
15. Bacterial conjugation is possible because of the presence of:
- A. Bacterial hormones
 - B. Bacterial enzymes
 - C. Sex pili
 - D. Sex flagella
16. Phenol is used as a mordant in the staining of:
- A. Bacterial endospores
 - B. Bacterial capsules
 - C. Acid fast organism
 - D. Cocco-bacilli organism

17. The following specimens are NOT suitable for anaerobic culture, EXCEPT
- A. Bone marrow
 - B. Voided urine
 - C. Nasal swab
 - D. Skin swab
18. The virus most likely to pass through the placenta and produce congenital defects in foetus is:
- A. Mumps
 - B. Rubella
 - C. Rubella
 - D. Varicella
19. Gram positive bacteria showing Chinese letter arrangement is characteristic of:
- A. Bacillus anthracis
 - B. Campylobacter jejuni
 - C. Clostridium perfringens
 - D. Corynebacterium diphtheriae
20. The most ideal enzyme test for the differentiation between pathogenic staphylococcus and other staphylococci species is:
- A. Oxidase test
 - B. Catalase test
 - C. Coagulase test
 - D. DNase test
21. Hydrogen sulphide production can be determined through the use of the following medium
- A. X-V factor Agar
 - B. MacConkey with crystal violet
 - C. Kligler iron agar
 - D. Xylose Lysin Deoxycholate Agar
22. Which of the following conditions may predispose a patient to candidiasis?
- A. Hormonal disorder
 - B. Coronary conditions
 - C. Immune deficiency disorder
 - D. Chronic respiratory conditions
23. The fact that microorganisms can enter the body by way of the dental crevices is evidenced by the:
- A. Increase in severity of systemic diseases after dental procedure
 - B. Presence of transient bacteria after dental procedure
 - C. High incidence of actinomycosis that occur after dental surgery
 - D. Increased numbers of oral microorganisms found in the dental crevices of persons with marginal gingivitis
24. Microbial drug resistance is an example of:
- A. Attenuation
 - B. Fluctuating change
 - C. Autotrophic variation

D. Mutation and selection

25. Which of the following bacteria can be isolated in an acid environment
- A. Shigella
 - B. Proteus
 - C. Neisseria
 - D. Lactobacillus
26. Ring worm fungus is an example of:
- A. Superficial fungi
 - B. Systematic fungi
 - C. Deep fungi
 - D. Opportunistic fungi
27. Which of the following methods will not achieve sterilization?
- A. Dry heat: 170 degrees C; 60 minutes
 - B. Boiling water: 100 degrees C; 2 hours
 - C. Autoclave: 121 degrees C; 20 minutes
 - D. Chemical vapour: 127 degrees C; 20 pounds pressure
28. Laboratory culture of pathogenic fungi needs humid incubation environment because
- A. They need a lot of moisture to grow
 - B. They have long incubation period
 - C. They require high incubation temperature
 - D. They grow in the body.
29. Clostridium defficile is the major cause of antibiotic diarrhea, the best method of treatment is;
- A. Administration of antitoxin
 - B. Take a lot of water
 - C. Discontinue predisposing antibiotic
 - D. Use of Doxyclyline in severe cases
30. Retroviruses cause persistent infections in man because:
- A. They do not usually kill the host cell
 - B. They usually cause lysis of the host cell
 - C. They usually undergo repeated antigenic changes
 - D. They do restrict their gene expression

SECTION B (30 marks – Answer all questions in this section in the spaces provided)

1. List any **THREE** characteristics of minimum inhibitory concentration (MLC) in drug sensitivity testing.
- (i)(1 mark)
 - (ii)(1 mark)
 - (iii)(1 mark)

2. List the factors that influence the effectiveness of individual antibiotics
- (i)(1 mark)
 - (ii)(1 mark)
 - (iii)(1 mark)

3. Differentiate between primary and secondary viral replication
- (i) Primary viral replication (1½ marks)
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- (ii) Secondary viral replication (1½ marks)
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4. Explain the purpose of anaerobic bacterial culture in microbial pathogenesis
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5. State the cause of each of the following forms of diseases
- (i) Diphtheria.....(1/2 mark)
 - (ii) Tinea pedic.....(1/2 mark)
 - (iii) Brucellosis.....(1/2 mark)
 - (iv) Aspergillosis.....(1/2 mark)
 - (v) Traveller’s diarrhea.....(1/2 mark)
 - (vi) Herpes.....(1/2 mark)

6. Define the following
- (i) Coenocytic hyphae (1 ½ marks)

 - (ii) Viral antigenic drift (1 ½ marks)

7. Explain the use of the Browne’s tubes in sterility checks (3 marks)
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8. List factors that influence the composition of the normal flora of the body.
- (i)(1/2 mark)
 - (ii)(1/2 mark)
 - (iii)(1/2 mark)
 - (iv)(1/2 mark)
 - (v)(1/2 mark)
 - (vi)(1/2 mark)

9. Define the following classes of media used in clinical bacteriology
- (i) Selective media.....(1 ½ marks)
 - (ii) Enrichment media.....(1 ½ marks)
10. Describe the working of the following disinfectants
- (i) Phenols.....(1 ½ marks)
 - (ii) Halogens.....(1 ½ marks)

SECTION C (40 marks – Answer any TWO questions from this section)

1. (a) Outline ways by which antibiotics act on pathogenic bacteria (10 marks)
- (b) State the approaches to the limitation and control of antimicrobial drug resistance by pathogenic bacteria (10 marks)
2. Discuss the following
- a) Superficial mycoses (5 marks)
 - b) Radiation sterilization (5 marks)
 - c) Specimen smear preparation (5 marks)
 - d) Viral evasion of immune surveillance (5 marks)
3. Outline:
- a) Procedure used in assay of antibiotics in the blood or any other body fluids (15 marks)
 - b) Factors that determine the choice of culture media in a diagnostic laboratory (5 marks)