



# THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of JKUAT)

*Faculty of Applied & Health Sciences*

DEPARTMENT OF MEDICAL SCIENCES

DIPLOMA IN MEDICAL LABORATORY SCIENCES

DIPLOMA IN PHARMACEUTICAL TECHNOLOGY (DMLS 12J/DPT 12J)

AML 2101: BACTERIOLOGY

END OF SEMESTER EXAMINATION

SERIES: APRIL 2012

TIME: 2 HOURS

## **Instructions to Candidates:**

You should have the following for this examination

- *Answer booklet*

This paper consists of **TWO** sections **A & B**

This paper consists of **SIX** printed pages

**SECTION A (40 MARKS – Attempt all questions, select only ONE choice)**

1. Who among the following is considered to be the discoverer of microorganisms?
  - a) Louis Pasteur
  - b) Antony Van Leuwenhoek
  - c) Alexander Fleming
  - d) John Tyndall
  
2. Which one of the following was not observed as an animalcule?
  - a) Yeast
  - b) Bacteria
  - c) Viruses
  - d) Protozoa
  
3. Pleomorphic bacteria are
  - a) Mycoplasma
  - b) Protoplasts
  - c) Shapeless
  - d) Spindle shaped
  
4. Gram stain of Propionibacterium showed both blue and pink cells because
  - a) The cell were over decolorized
  - b) The cells were old
  - c) Iodine was not applied
  - d) The cells are GRAM variable
  
5. Immersion oil is used when using objective power
  - a) 1000
  - b) 4
  - c) 100
  - d) 40
  
6. Which one of the following is not used in Gram Stain
  - a) Safranin
  - b) Methyl red
  - c) Acetone
  - d) Crystal violet
  
7. Cell wall of Gram positive bacteria is different from Gram negative bacteria because
  - a) It stains blue
  - b) It has peptidoglycan
  - c) It is thicker than that of Gram negative
  - d) It has more lipids than that of gram negative
  
8. In acid fast stain the role of heat is
  - a) To make sure that all tuberculosis cells are dead
  - b) Enhance penetration of the primary stain into the cells
  - c) To heat fix bacteria which are being stained
  - d) To melt mycolic acids
  
9. Endospores are:
  - a) Cytoplasmic inclusions
  - b) Heat labile structures
  - c) Dormant structures produced by stressed bacteria
  - d) Heat resistant bacteria

10. In the Ziehl-Neelsen staining method the counter stain is
- Methylene blue
  - Safranin
  - Phenol
  - Malachite green
11. Which is the correct way of printing STAPHYLOCOCCUS AUREUS
- Staph aureus*
  - Staph aureus
  - Staphylococcus aureus
  - Staphylococcus aureus*
12. The work of Christian Gram led to the division of bacteria into:
- Rods and Cocci
  - Gram type and acid fast type
  - Gram positive and gram Negative bacteria
  - None of the above
13. The percentage of agar in broth media is
- 0%
  - 1.5%
  - 15%
  - 9.6%
14. Bacteria can digest agar to obtain
- Nitrogen
  - Carbon
  - Simple sugars
  - None of the above
15. Which of the following technique is employed to get isolated bacterial colonies
- Mueller Hinton Technique
  - Streak plate technique
  - Broth culture
  - Transplant technique
16. Which one of the following is not carried out in the hanging drop method
- Preparation of smear
  - Observing live bacteria
  - Investigating bacteria motility
  - Preparation of a bacteria suspension
17. A bacteria smear yielded blue and pink colour bacteria following Gram staining. Which of the following reasons is not acceptable.
- The bacteria was Propionibacterium
  - The cells were young
  - The smear was decolourized
  - The cells were old
18. The Primary stain in Gram staining technique is.
- Gentian violet
  - Crystal violet
  - Iodine
  - Safranin

19. Bacteria cells that appear blue following acid fast staining are
- Acid fast bacteria
  - Gram positive
  - Cationic
  - Non acid fast bacteria
20. Which microscope is used to distinguish cytoplasmic organelles
- Dark field microscope
  - Bright field microscope
  - Florescent microscope
  - Ordinary microscope
21. Which statement is not true about halotolerants
- They grow well in media containing sodium chloride
  - Staphylococcus is a good example
  - They lack peptidoglycan
  - They multiply by binary fission
22. Bacteria can obtain nitrogen from
- Proteins
  - Inorganic salts
  - Atmospheric nitrogen
  - All of the above
23. Fastidious bacteria can grow in
- Simple media
  - Nutrient agar
  - Media with additional supplements like vitamins
  - None of the above
24. Microorganisms which utilize  $\text{CO}_2$  as the only source of carbon
- Are prototrophs
  - Can use radiant energy
  - Are photosynthetic
  - All of the above
25. Bacteria which are killed by slightest presence of oxygen are
- Strict anaerobes
  - Obligate aerobes
  - Facultative anerobes
  - Microarophilic bacteria
26. Two bacteria with generation time of 20 minutes were inoculated, how many were they after 1 hour.
- 2
  - 20
  - 16
  - 8
27. Non motile bacteria move by the means of
- Flagella
  - Fimbriae
  - Pseudopodia
  - None of the above
28. Which of the following is not true for eukaryotic and prokaryotic cells
- Both have ribosomes
  - Both have preptidoglycan

- c) Both have DNA
  - d) Both have cytoplasmic membrane
29. The optimum temperature of a given bacteria was 10°C, the bacteria is:
- a) Temperature dependant
  - b) Mesophile
  - c) Psychrophile
  - d) Extreme thermophile
30. Pressure is applied when using an autoclave in order
- a) To apply pressure on the bacteria
  - b) Increase boiling point of water
  - c) To initiate steam production
  - d) None of the above
31. In which way do bacteria differ from plants and animals in sourcing for nitrogen
- a) Bacteria utilize elemental nitrogen
  - b) Bacteria break down proteins
  - c) Bacteria break down inorganic nitrogen compounds
  - d) Bacteria break down organic nitrogen compounds
32. In which phase of the bacterial growth curve, that highly active cells can be found
- a) The lag phase
  - b) The log phase
  - c) The nuclear phase
  - d) The stationary phase
33. Which structure is involved in reproduction in bacteria
- a) The fimbriae
  - b) Cell wall
  - c) Sex pilus
  - d) The flagella
34. Which of the following can lead to formation of endospores
- a) Availability of excess nutrients
  - b) Moisture
  - c) Dry and nutrient deficit environment
  - d) Presence of Gram positive bacteria
35. Taxonomy includes
- a) Identification
  - b) Nomenclature
  - c) Classification
  - d) All of the above
36. Which of the following is not a phenotypic characteristic
- a) Presence of plasmid
  - b) Presence of yellow coloured colonies
  - c) Rod shaped bacteria
  - d) Motility
37. Microorganisms are cosmopolitan, which of the following statement is not true
- a) Bacteria can be found on the top of mount Kenya
  - b) Bacteria are abundant in human blood
  - c) Bacteria can be found on the skin
  - d) Bacteria can be found in air
38. Which of the following is not true about a disinfectant
- a) It destroys endspores

- b) It reduces the number of bacteria
  - c) Some microorganisms can survive
  - d) It can inhibit growth of some bacteria
39. Traditionally Microbiology has been considered the study of
- a) Protozoa
  - b) Fungi
  - c) Viruses
  - d) Bacteria
40. The role of agar in media is to
- a) Provide nitrogen and trace elements
  - b) Solidify the media
  - c) Activate bacterial growth
  - d) Provide moisture
41. Ziehl Neelsen method is
- a) Capsule staining method
  - b) Acid fast stain method
  - c) Simple staining method
  - d) Endospore staining method

**SECTION B (60 MARKS – Answer ALL questions)**

**Question 1**

- a) Differentiate between synthetic and complex media (10 marks)
- b) Explain how bacteria can be classified on the basis of pH requirements (10 marks)

**Question 2**

- a) Illustrate the streak plate method (10 marks)
- b) Compare the difference between Gram stain and Acid fast stain procedures (10 marks)

**Question 3**

- Discuss in details the bacterial growth curve and its importance (20 marks)