



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Applied and Health Sciences

DEPARTMENT OF **MEDICAL SCIENCES**

DIPLOMA IN MEDICAL LABORATORY SCIENCES
(DMLS 12S)

AML 2150: INSTRUMENTATION

SPECIAL/SUPPLEMENTARY: EXAMINATIONS

SERIES: February 2013

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this examination

- *Answer booklet*

This paper consists of **TWO** sections.

Answer all questions in **Section A** and **B**. $\frac{1}{2}$ marks deducted for any wrong answer in **Section A**.

*This paper consists of **6 PRINTED** pages*
SECTION A (40MARKS)

1.

2.

3.

4. The minimum distance at which a microscope is capable of distinguishing two points as separate is its
 - a) Magnification
 - b) Illumination
 - c) Resolving power
 - d) None of the above

5. An organism viewed with low power objective in place would be magnified _____ times
 - a) 10 times
 - b) 1000 times
 - c) 400 times
 - d) 100 times

6. Oil should be added to a microscopic slide when viewing it with the ____ objective
 - a) 4X
 - b) 10X
 - c) 40X
 - d) 100X

7. What piece of laboratory equipment is best-suited for sterilization of wire loops during culturing of specimen on culture media?
 - a) Bunsen burner
 - b) Hot air oven
 - c) Autoclave
 - d) None of the above

8. Which laboratory equipment / instrument can be used for protecting the laboratory worker from aerosol contamination?
 - a) Face mask
 - b) Safety cabinet
 - c) Beaker
 - d) None of the above

9. Differential centrifugation is a process that :
 - a) Separates different components of the cell that function differently
 - b) Separates components of the cell that have a different chemical make up
 - c) Analyses the chemical components of the cell
 - d) Separates components of the cell that have different densities

10. Magnifying power of a microscope is calculated by

- a) Multiplying the power of objective lens by eye piece
 - b) Multiplying the power of objective lens with the distance between the objective lens and the specimen
 - c) Adding the power of objective lens and eye piece
 - d) Subtracting power of objective lens from that of eye piece
11. The number of lenses in a compound microscope is
- a) 2
 - b) 1
 - c) 3
 - d) 4
12. Cover slip is put on the mounted material on a slide very gently to:
- a) Avoid oozing of stain
 - b) Avoid oozing of glycerine
 - c) Avoid entry of air bubbles
 - d) Avoid the crushing of mounted materials
13. What should be used to hold laboratory culture media before weighing it?
- a) Weighing boat
 - b) Culture plate
 - c) Writing paper
 - d) None of the above
14. What part of the microscope is used to make the final focusing adjustments?
- a) The diaphragm
 - b) The coarse focusing dial
 - c) The fine focusing dial
 - d) The objective lens
15. Which one is/are found in a colorimeter?
- a) Curette
 - b) Light source
 - c) Photo sensor
 - d) Fuel source
16. Which of the following microscopes would you use to examine a live red blood cell?
- a) Bright field microscope
 - b) Dark field microscope
 - c) Dissecting microscope
 - d) Fluorescent microscope
17. Which of the following microscopes would you use to examine viruses on a specimen?
- a) Bright field microscope
 - b) Electron microscope
 - c) Polarizing microscope
 - d) Fluorescent microscope

18. Culture plates may be sterilized using:
- The oven
 - Filtration
 - Burnsen burner
 - None of the above
19. The values of the following substances can be measured using potentiometry
- Na⁺
 - K⁺
 - Mg²⁺
 - Ca²⁺
20. The resolution of the bright field microscope is:
- 2.0μm
 - 0.25μm
 - 0.025μm
 - 0.0025μm
21. When using a X10 eye piece and the X10 objective of a bright field microscope, the total magnification is?
- 10
 - 20
 - 1000
 - 100
22. Which of the following equipments is used to demineralize water?
- Deionizer
 - Centrifuge
 - pH meter
 - Colorimeter
23. Which of the following equipments can be used for measuring and dispensing fluids?
- Volumetric flask
 - Calibrated pipette
 - Measuring cylinder
 - Biurette
24. Deionization of impure water means
- Boiling
 - Filtration
 - Exchange cations and anions
 - None of the above
25. The hot air oven sterilizes at
- 121°C
 - 100°C
 - 160°C
 - 115°C

26. The microscope that can be used in demonstration of live syphilis causing organisms is
- a) Light microscope
 - b) Ultra-violet microscope
 - c) Dark field microscope
 - d) None of the above
27. Which of the following equipments can be used for sterilization?
- a) Bunsen burner
 - b) Pressure cooker
 - c) Hot air oven
 - d) None of the above
28. Which of the following can be sterilized by flaming?
- a) Culture media
 - b) Test tubes
 - c) Cotton wool
 - d) None of the above

SECTION B ESSAY (60MARKS) Answer all questions

Question ONE

Describe the following

- a) The hot air oven as an equipment for sterilization **(10marks)**
- b) Class THREE biosafety cabinets **(10marks)**

Question TWO

Describe the following

- a) TWO types of centrifuges used in the laboratory (10marks)
- b) The preparation of distilled water and its use in the laboratory (10marks)

Question THREE

- a) Outline the following
 - (i) The care maintenance of centrifuges (5marks)
 - (ii) The care and maintenance of weighing balances (5marks)
- b) Describe the components of the spectrophotometer. (10marks)