TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Applied and Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

CERTIFICATE IN MEDICAL LABORATORY SCIENCES
(CMLS 13M)

AML 1150 : MEDICAL INSTRUMENTATION

SPECIAL/SUPPLEMENTARY : EXAMINATIONS

SERIES: OCTOBER 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.** ½ marks deducted for any wrong answer in **Section A**.

*This paper consists of **8 PRINTED** pages*

SECTION A (40MARKS)

1. An object viewed with the high power objective in place would be magnified ___times
   a) 1000X
   b) 400X
   c) 100X
   d) 10X

2. The ability of a microscope to distinguish two closely related points as separate entities is reffered to as:
   a) Micrometry
   b) Illumination
   c) Magnification
   d) Resolving power

3. Which one of the is a characteristic of a hard glass
   a) Can not withstand high temperatures
   b) Store some volume of fluids
   c) Can be used to hold not solutions
   d) Cheap

4. Transfer of fluids from one container to the other is done by the use of:-
   a) Spatula
   b) Pipetes
   c) Test tubes
   d) Beakers

5. The following are types of microscope except
   a) Bright field microscope
   b) Dark field microscope
   c) Electron microscope
   d) Stethoscope

6. A colorimeter has the following parts except
   a) Curvectes
   b) Fule source
   c) Photosenser
   d) Micrometer

7. Stained preparation are best examined by
   a) Dark field microscope
   b) Fluorescent microscope
   c) Dissecting microscope
   d) Bright field microscope
8. Election microscopes include the following which one is not:-
   a) Flourescence microscope
   b) Reflection lectron microscope
   c) Scanning election microscope
   d) Transmission electron microscope

9. Oil immersion should be used when using which objective
   a) 40X
   b) 10X
   c) 100X
   d) 4X

10. Magnifying power of a microscope is calculated by:-
   a) Multiplying the power of objectives lens and the eyepiece lens
   b) The product of objective lens with the distance between the objective lens and the specimen
   c) The sum of objective power and eyepiece lens
   d) The difference between the objectives power with that of the eye piece

11. Differential centrifugation is a process that:
   a) Separate components of cells that have different densities
   b) Separate components of the cells that function differently
   c) Separates different all chemical components
   d) Analyses the chemical constituents of the cell

12. The function of oil immersion is to :-
   a) Increase the durability of the objectives lens
   b) Block the amount of light reaching the eye piece.
   c) Increase the refractive index so as to get a clear view of the smear examined
   d) To ensure that the slide do not break when in contact with the objective lens

13. The pH of a solution is measured by
   a) Photometer
   b) Deionizer
   c) pH meter
   d) Colorimeter

14. Measuring and dispensing of solutions in the lab can be done by the use of:
   a) Measurement cylinder
   b) Abjoun – bottle
   c) Colin jar
   d) Culture plate

15. Culture media can be sterilized by
   a) Filtration
   b) Autoclaving
   c) Heating with Bunsen burner
   d) Heating with hot air oven

16. Fluorophone smears can be best examined using
   a) Fluoresent microscope
   b) Polarizing microscope
   c) Dark field microscope
   d) Bright field microscope

17. Which of the following can not be used for sterilization
    a) Burnsenburner
    b) Autoclave
    c) Waterbath
    d) Hot air oven

18. Which of the following is not a component of a microscope
    a) Mechanical parts
    b) Light source
    c) Optical parts
    d) Photometer

19. Fluorescence microscopy can be applied in the following studies except
    a) Immuno diagnosis by direct and indirect fluorescent antibody test
    b) Examination of auramine-phenol stained sputum and c.s.f for acid fast baciili (A .f.B)
    c) Examination of alcidine orange stained specimen for detection of parasites and bacteria
    d) Examination of wet preparations

20. Glassware are classified according to :-
    a) Physical properties
    b) Manufacturing process
    c) Cost
    d) All of the above

21. Weight instruments in the laboratory include the following. Which one is not?
    a) Beam balance
    b) Tipple balance
    c) Single pan balance
    d) Measuring cylinder

22. Which one of the following is not a part of a microscope
    a) Mechanical stage
    b) Resolving nosepiece
    c) Iris lever
    d) Total magnification

23. Which of the following can not be sterilized by autoclaving :-
    a) Proteinous solution
    b) Forceps
    c) Culture media
    d) Glass Petridis

24. A general purpose centrifuge is needed to:-
    a) Perform parasite concentration techniques
    b) Separate chemical constituents
    c) Separate colours of solutions
    d) All of the above

25. A proper care of microscope includes the following except
    a) Cover the microscope when not in use
    b) Disconnect the battery terminals or power source after end of examination
    c) Keep the microscope away from direct sum light and near the power source
    d) Place the microscope at the edge of the bench for easy examination

26. The sequence of light movement in a colorimeter is
    a) Light source – colour filter – cureiles – lightdetector ▭ meter
    b) Meter ▭ light source – colour filter – curettes – light detector
    c) Light source – curveiles – colour filter – lightdetector – meter
    d) Light detector – curveter – light source – colour filter

27. Source of error in a colorimeter includes:-
    a) Use of resued clean curetes
    b) Plating the curvetes in the chamber in the correct position
    c) Use of curettes not recommended by the manufacturer
    d) Use of correct filter

28. The values of this following can be measured using potentiometry
    a) Chloride
    b) Bicarbonate
    c) Sodium
    d) Sulphate

29. The resolution of a bright field microscopy is
    a) 2.0
    b) 0.25
    c) 0.025
    d) 0.0025

30. When using a 10X objective and the 40X objective of a bright field microscope, the total magnification :-
    a) 100
    b) 50
    c) 400
    d) 40

31. _____ is used to focus objects in a sample under the microscope
    a) The diaphragm
    b) Condenser
    c) Stage
    d) Focusing knobs

32. The correct sterilizing line and pressure at an attribute of sero metres is
    a) 30 minutes at 118˚C
    b) 15minutes at 121˚C
    c) 40 minutes at 116˚C

d) 25 minutes at 118˚C

33. A stirrer is used in the laboratory to:-
    a) Incubate samples
    b) To separate sample
    c) To mix samples by shaking
    d) To sterilize equipments

34. A micrometer in the microscope is used to measure _____ of the objects under examination
    a) Size
    b) Volume
    c) Area
    d) Depth

35. A laboratory is a place where :-
    a) A scientific research is done
    b) Theatre films are shot
    c) Entertainment is done
    d) Diagnosis of diseases is done

36. A centrifuge operates using :-
    a) Centrifugal force
    b) Pressure
    c) Force of gravity
    d) None of the above

37. A vernier caliper on the microscope stage is used to
    a) Measure the length of the slide
    b) Measure the length of the specimen
    c) Locate the position of an item under examination on the specimen
    d) Measure the per focal length

38. Incubation in the laboratory can be done using
    a) Hot air oven
    b) Heat block
    c) Autoclave
    d) Burnsen burner

SECTION B

1. (a) Describe the use and care of an autoclave **(10marks)**

   (b) Define the following terminologies as used in a medical laboratory

   (i) Precision **(2marks)**

   (ii) Tarring **(2marks)**

   (iii) Total magnification **(2marks)**

   (iv) Resolving power **(2marks)**

   (v) Working distance **(2marks)**

2. (a) List the characteristics of hard glass **(7marks)**

   (b) highlight the general properties of glassware **(5marks)**

   (c) List the factors to consider when selecting a manual or semi-automatic devices for pipeting

   (8marks)

3. (a) Describe how you can systematically examine a smear on a slide under the marscope

   (10marks)

   (b) List any FIVE items which can be sterilized by autoclaving **(5marks)**

   (c) Explain the care of mechanical balances **(5marks)**