



TECHNICAL UNIVERSITY OF MOMBASA
Faculty of Applied & Health
Sciences

DEPARTMENT OF MEDICAL SCIENCES
DIPLOMA IN MEDICAL LABORATORY SCIENCES

EHL 2150: INSTRUMENTATION

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: MARCH 2014

TIME ALLOWED: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

Answer **ALL** questions provided

This paper consists of **EIGHT** printed pages

4. What name is given to the distance between the front lens of the objective and the object slide when the image is in focus?
 - a) Magnification
 - b) Illumination
 - c) Resolving power
 - d) Working distance
 - e) Focal distance

5. An organization viewed with the low power objectives in place would be magnified times:
 - a) 10 times
 - b) 1000 times
 - c) 400 times
 - d) 100 times
 - e) 100,000 times

6. What piece of the laboratory equipment is best suited for sterilization of unused culture plates:
 - a) Bunsen burner
 - b) Hot air oven
 - c) Autoclave
 - d) Inclinator
 - e) Incubator

7. The following laboratory equipment/instrument can be used for protecting the laboratory worker from aerosol contamination except?
 - a) Face mask
 - b) Safety cabinet
 - c) Incubator
 - d) Goggles
 - e) Laboratory Coat

8. How many types of lenses are there in a compound microscope?
 - a) 2
 - b) 1
 - c) 3
 - d) 4
 - e) 10

9. Coverslip is put on the mounted material on a slide 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
 - e) Improve contract

10. What should be used to hold laboratory culture media before weighing it?
- Weighing boat
 - Writing plate
 - Writing paper
 - Insulation tape
 - None of the above
11. What part of the microscope is used to change from one objective lens to the next?
- Diaphragm
 - Coarse focusing dial
 - Fine focusing dial
 - Rotating nose
 - Condenser
12. The following components are found in an autoclave except?
- Basket
 - Drainage
 - Bucket
 - Air outlet valve
 - Boiler
13. Which of the following microscopes would you use to examine live red blood cells?
- Bright field microscope
 - Dark field microscope
 - Dissecting microscope
 - Fluorescent microscope
 - Phase contract microscope
14. Which of the following microscopes is capable of giving the highest magnification?
- Bright field microscope
 - Electron microscope
 - Polarizing microscope
 - Fluorescent microscope
 - Dark field microscope
15. Which of the following equipment may be used to sterilize spatulas?
- The incubator
 - Filters
 - Spirit lamp
 - Micropipette
 - Water bath
16. The following values can be measured using potentiometry:
- Blood pressure
 - Temperature
 - pH

- d) Pulse rate
- e) Weight

17. What is the maximum resolving power of good medical laboratory microscope?

- a) 2.0 μm
- b) 0.25 μm
- c) 0.025 μm
- d) 0.0025 μm
- e) 25mm

18. When using a X10 eye piece the X40 objective of a bright field microscope, the total magnification is:

- a) 10
- b) 20
- c) 1000
- d) 400
- e) 100000

19. Which of the following equipments is used to demineralize water?

- a) Deionizer
- b) Centrifuge
- c) pH meter
- d) Colorimeter
- e) Spectrophotometer

20. Which of the following equipment can be used for measuring and dispensing fluids:

- a) Universal bottle
- b) Orlenmeyer flask
- c) Biju bottle
- d) Culture plate
- e) Wire loop
- f) Spatula

21. The following laboratory equipment/instrument can be used for protecting the laboratory worker from aerosol contamination except?

- a) Face mask
- b) Safety cabinet
- c) Incubator
- d) Goggles
- e) Laboratory Coat

22. The hot air oven sterilizers at:

- a) 120°C
- b) 100°C
- c) 160°C
- d) 115°C
- e) 1000°C

23. Which of the following microscopes can be used in demonstration of like red blood cell:
- Light microscope
 - Ultra-violet microscope
 - Dark field microscope
 - Scanning electron microscope
 - Scanning electron microscope
 - Transmission electron microscope
24. Which of the following equipment can be used for sterilization?
- Incubator
 - Pressure cooker
 - Hot air oven
 - Biosafety cabinet
 - Centrifuge
25. The following can be sterilized by flaming except?
- Spatula
 - Glass Petri dish
 - Glass syringes
 - Bijou bottle
26. The following microscopes use light as a source of illumination except?
- Bright field microscope
 - Dark field microscope
 - Phase contrast microscope
 - Fluorescent microscope
 - Scanning electron microscope
27. The following includes types of filters used in microbiology except?
- Seitz filter membrane
 - Sintered glass filters
 - Chamber land filters
 - Bakersfield filters
 - McFarland filters
28. Which of the following centrifuges is refrigerated:
- Ultra centrifuge
 - Angle head centrifuge
 - Horizontal-head centrifuge
 - Vertical head centrifuge
 - Super centrifuge
29. When using a triple beam balance, what should you remember before weighing anything?
- Check if the pan is free from dust
 - Always check the poises on the beam
 - Always check the pointer if is set to zero

- d) Adjust the poise one at time from zero to attain 100% accuracy
 - e) None of the above
30. What is the function of mechanical state control:
- a) Hold the slide on the stage firmly
 - b) Focus light on the slide
 - c) Move the slide on the stage
 - d) To adjust the amount of light
 - e) To magnify the image
31. Which of the following describes the function of mechanical stage control in a microscope?
- a) Magnification of object
 - b) It is source of light
 - c) Moving the object slide on the stage
 - d) Rotating the objective lenses
 - e) Holding the slide on the stage
32. The following are physical methods of sterilization except:
- a) Autoclaving
 - b) Pasteurization
 - c) Fumigation
 - d) Boiling
 - e) Incineration
33. Which of the following states lamberts law:
- a) Absorbance of a solution is directly proportional to the concentration of the solution
 - b) Absorbance of solution is directly proportional to the thickness of the optical path
 - c) Absorbance of solution is indirectly proportional to the thickness of the optical path
 - d) Absorbance of solution in indirectly proportional to the concentration of the solution
 - e) None of the above
34. The following components are found in a spectrophotometer
- a) Boiler
 - b) Basket support
 - c) Curette
 - d) Safety valve
 - e) Air outlet valve
35. The following components are found in a colorimeter except:
- a) Galvanometer
 - b) Slit
 - c) Curette
 - d) Light source
 - e) Element
36. Who developed the compound microscope?
- a) Hans Jansen
 - b) Zachariah
 - c) Galileo Galilei

- d) Robert Hooke
- e) Auto van Leeuwenhoek

37. The swing bucket centrifuge is also known as:

- a) Vertical centrifuge
- b) Ultra centrifuge
- c) Mechanical centrifuge
- d) Angle head centrifuge
- e) Horizontal centrifuge

38. Which of the following laboratory equipment can be used to prevent aerosol contamination culturing:

- a) Bioret
- b) Evaporating dish
- c) Beaker
- d) Safety cabinet
- e) Wire gauze

39. Differential centrifugation is a process that:

- a) Separates different components of the well that function differently
- b) Separates components of the cell that had a different chemical makeup boiling
- c) Analyzes the chemical components of the cell
- d) Separates components of the cell that have different densities
- e) Measures pH of fluids

40. Which of the following safety cabinets is used when working with specimen suspected to contain Ebola virus:

- a) Class 1 biosafety cabinet
- b) Class 2 biosafety cabinet
- c) Class 3 biosafety cabinet
- d) Class 4 biosafety cabinet
- e) Class 5 biosafety cabinet

SECTION B (60 MARKS)

1. Describe the following:

- a) The adjustment system of a microscope **(10 marks)**
- b) Factors influencing heat sterilization **(10 marks)**

2. Describe:

- a) Class II biosafety cabinet **(10 marks)**
- b) Outline general laboratory safety guidelines **(10 marks)**

3. a) Explain the functions of 5 parts of an autoclave **(10 marks)**

- b) Outline the procedure of operating a centrifuge audits care and maintenance. **(10 marks)**