



TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MEDICAL ENGINEERING

BACHELOR OF SCIENCE IN MEDICAL ENGINEERING

BSMD/MAY 2015/S-PT

ECL 4401

BIOMEDICAL EQUIPMENT 1

2 hrs

INSTRUCTIONS TO CANDIDATES:

- This paper consists of **FIVE** questions
- Answer question **ONE COMPULSORY** and Attempt any Other **TWO**
- This paper consists of 3 printed pages

Question1

(COMPULSARY)

- (a) i) Write the maintenance of the following parts of the semi-automated Blood Cell Counters:
- I) Sensing Zone
 - II) Manometer
 - III) Vacuum System
- ii) Outline any THREE sources of errors in a Semi-automated Blood Cell Counters:
- (12 marks)
- (b) i) Differentiate between polarized and phase contrast microscopy
- ii) With the aid of a diagram explain the principle of dark field microscopy
- (12 marks)
- (c) Explain the principle operation of microhaemocrit centrifugation
- (6 marks)

Question2

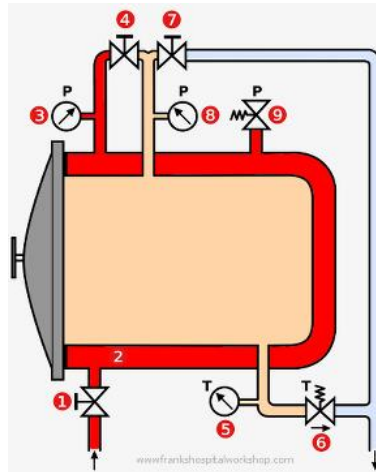
- (a) i) Differentiate between transmission electron microscope (TEM) and the scanning electron microscope (SEM).
- ii) Describe the following systems of a microscope.
- I) magnification system
 - II) illumination system
- (12 marks)
- (b) Schedule the procedure of centering the condenser of a light microscope
- (8 marks)

Question3

- (a) i) Explain the principle of *Centrifuge Force*
- ii) With the aid of a diagram, explain the difference between swing out head and angle heads of a centrifuge
- (12 marks)
- (b) Explain the principle of operation on electromagnetic blood flow meter
- (8 marks)

Question4

- (a) Using the diagram in figure 1, describe the process of loading and heating up in this equipment with the help of the labelled part numbers



(12 marks)

- (b) i) State any THREE common faults of a microscope
 ii) Outline the cleaning procedure of an oil immersion objective lens in a microscope

(8 marks)

Question 5

- (a) With the aid of a labelled circuit diagram, describe how the speed of a centrifuge may be varied using a phase control method

(12 marks)

- (b) Describe the method of using chemical indicators to test performance of autoclave.

(8 marks)