TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF MEDICAL ENGINEERING

BACHELOR OF SCIENCE IN MEDICAL ENGINEERING

BSMD/SEPT 2015/J-FT & BSMD/SEPT 2016/S-EV

ECL 4301
DIAGNOSTIC MEDICAL TECHNOLOGY

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) With the aid of structural diagram, describe the construction features of flexible endoscope

(10 marks)

(b) i) Draw a labelled block diagram of a flame photometer assembly

ii) Explain the principle of flame photometry as applied in the diagram (i)

(12 marks)

(c) Explain the principle of Transmission Electron Microscope (TEM)

(8 marks)

Question2

(a) i) Schedule the procedure of centering the condenser of a light microscope

ii) Differentiate between transmission electron microscope (TEM) and the scanning electron microscope (SEM).

(12 marks)

(b) Explain the principle of diffraction granting in spectrophotometers

(8 marks)

Question3

(a) Explain the additional precautions that should be taken in Hot and Humid climates when using alight microscope.

(8marks)

(b) Describe the following methods of blood pressure measurement

i) The Oscillometric method

ii) The Auscultatory method

iii) The Ultrasonic method

(12marks)

Question4

(a) Explain how the application of Positive End Expiratory Pressure (PEEP) improves the artenal blood oxygen partial pressure P_aO_2 of a patient

(8 marks)

(b) i) State any ***TWO*** high energy excitation sources for atomic emission spectroscopy

ii) With the aid of diagram, explain the principle of operation of an Atomic Absorption Spectrometry (AAS)

(12 marks)

Question5

(a) Outline any ***TWO*** artefacts effects in an ultrasound equipment.

(2 marks)

(b) i) Draw a labelled diagram to illustrate a relationship between Functional Residual Capacity (FRC) and Residual Volume (RV):

ii) State any TWO advantage of non-invasive blood pressure units over the invasive type

(10 marks)

(c) Explain the principle of impedance pneumography in determining respiration rate.

(8 marks)