



**TECHNICAL UNIVERSITY OF MOMBASA**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**DEPARTMENT OF MEDICAL ENGINEERING**

**DIPLOMA IN MEDICAL ENGINEERING**  
**DME/SEPT 2013/SF-T**

**ECL 2305**  
**MATERNITY EQUIPMENT**

**2 Hours**

**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) Explain the procedure of temperature stability test performed on an infant incubator

(8 marks)

(b) Draw a labelled block diagram of an infant incubator and explain the function of each block

(12 marks)

(c) i) Explain the need of weighing scales as applied in maternity practice

ii) Explain the following term as applied in ultrasound imaging

i. artefacts

ii. attenuation

iii) Explain the good care of the ultrasound scanning probes in ultrasound imaging practice

(10 marks)

### Question2

(a) i) Explain the need for infant incubators in health facility

ii) Explain the causes of overheating of the equipment in a(i) in clinical application

(8 marks)

(b) i) State the qualitative tests that should be carried out on infant incubators

ii) With the aid of the body and environmental temperature diagram in a body incubator, explain how the balance between heat gain and loss is achieved.

(12 marks)

### Question3

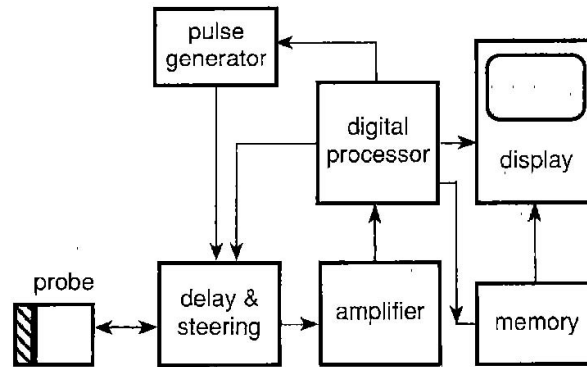
(a) Outline the basic steps taken to rectify each of the following faults in Ultrasound

i) depreciting image quality;

ii) wavy or small image

(8 marks)

(b) Figure 1 shows a block diagram of an Ultrasound Imaginng machine



- i) Outline the functions of the following blocks
  - i. Delay & steering
  - ii. Pulse Generator
  - iii. Digital processor
  - iv. Amplifier
- ii) State any FOUR technical maintenance carried out on Ultrasound Imaging machine

(12 marks)

#### Question4

- (a)
  - i) Explain Doppler effect as applied in ultrasound equipment
  - ii) Differentiate between therapeutic and diagnostic ultrasound in medical field
- (b) Outline the following procedures with reference to Suction machine;
  - i) User Maintenance
  - ii) Technician Maintenance

(8 marks)

(12 marks)

#### Question5

- (a) Explain the principle of using impedance pneumography in Apnoea monitor when breathing of a premature baby.
- (b) Draw a functional block diagram of infant incubator with air mode and baby mode.
- (c) Differentiate between the air mode and baby mode temperature controls off the block diagram in (b) stating typical values of controlled temperatures.

(4 marks)

(8 marks)

(8 marks)