



# TECHNICAL UNIVERSITY OF MOMBASA

*Faculty of Engineering and Technology*

## DEPARTMENT OF MEDICAL ENGINEERING

### DIPLOMA IN MEDICAL ENGINEERING

DME/SEPT 2013/S-FT

ECL 2305  
MATERNITY EQUIPMENT

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 a block diagram, explain the operation of an air mode controlled incubator.

(12 marks)

- (b) Describe the following ultrasound treatment parameters;

- i) Pulse mark to space ratio
- ii) Intensity
- iii) artefacts
- iv) attenuation

(8 marks)

- (c) 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.

(10 marks)

### Question2

- (a) State any THREE influences that can cause errors in balances during measurement of Weight or mass of a baby

(3 marks)

- (b) With the aid of a diagram, explain the operation of ultrasound scanner.

(12 marks)

- (c) Explain the causes of overheating of the infant incubators in health facility

( 5 marks)

### Question3

- (a) State any THREE medical requirement of infant incubators

(3 marks)

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

(8 marks)

- (c) i) Explain the function tests a technologist is supposed to carry on infant incubator

- ii) Explain why function test are necessary on all patient connected machines

(9 marks)

#### Question4

(a) Describe the activities in the following section of maternity department

- i) Postnatal Ward
- ii) Ante natal Ward
- iii) Labour ward.
- iv) Under five clinic.

( 8 marks)

(b) With the aid of control diagrams, explain the principle of any TWO of the following transducers.

- i) Variable capacitance transducer
- ii) Linear Variable Differential Transducer
- iii) Resistance Transducer

(12 marks)

#### Question5

(a) Explain the function of the following medical devices

- i) Phonocardiograph
- ii) Cardiotocograph
- iii) Phototherapy Lamp
- iv) Aponea Monitor

(8 marks)

(b) With reference to an Infant Incubator, explain the cause of;

- i) Fan fail Alarm
- ii) low insulation resistance
- iii) Temperature not corresponding to set Temperature

(6 marks)

(c) i) Explain the purpose of filter in suction machine

- ii) Explain the method of heat distribution in the incubator

(6 marks)