



# **MACHAKOS UNIVERSITY**

**University Examinations for 2018/2019 Academic Year**

**SCHOOL OF HEALTH SCIENCES**

**DEPARTMENT OF PUBLIC AND COMMUNITY HEALTH**

**SECOND SEMESTER END OF YEAR EXAMINATION FOR**

**DIPLOMA IN HEALTH RECORDS**

**DHR 013: MEDICAL INSTRUMENTATION**

**DATE: 7/5/2019**

**TIME: 2:00 – 4:00 PM**

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## **INSTRUCTIONS:**

- **This paper consists of two sections A and B**
- **Section A is Compulsory and has two parts (i) and (ii)**
- **Do not write on the question paper**

## **SECTION A: QUESTION ONE: COMPULSORY (30 MARKS)**

### **PART I : MULTIPLE CHOICE QUESTIONS (MCQs) 10MARKS**

1. Which of the following terms best describe a medical device;
  - a) An instrument used alone and not including any necessary software
  - b) Software used in diagnosis, prevention and treatment of disease
  - c) Material used in combination of others to do anything medical
  - d) Any instrument intended by the manufacturer to be used, alone or in combination, for human beings, for one or more of the specific medical purposes.
2. Medical devices found in the hospital could be used for all of the following except;
  - a) Prevention
  - b) Rehabilitation
  - c) Comprehensiveness
  - d) Therapeutic

3. \_\_\_\_\_ is the physical quantity, property, or condition that the system measures
  - a) Sensor
  - b) Output display
  - c) Signal Conditioner
  - d) Measurand
  
4. Which of the following laboratory devices is used to separate the components of samples provided;
  - a) Centrifuge
  - b) Microscope
  - c) PH meters
  - d) Spectrophotometers
  
5. The following are physiological measurement devices except;
  - a) Thermometers
  - b) ECG
  - c) Spirometers
  - d) Doppler imaging
  
6. Prosthetic devices are devices that:
  - a) Helps replace, correct or support a body part or function of a body part
  - b) Improve appearance and do not impart any health benefits.
  - c) Replace certain critical physiological functionalities, or provide needed pain therapy.
  - d) Help people recover their functioning after injury or illness.
  
7. Which of the following is not a modality available in radiology
  - a) Ultrasound
  - b) CT
  - c) MRI
  - d) Chromatography

8. The most useful application for fluoroscopy include;
- a) Chest
  - b) Musculoskeletal
  - c) Gastrointestinal imaging
  - d) Abdomen with limitation
9. Endoscopy can be used for the diagnosis of the following except
- a) Gastritis
  - b) Pancreatitis
  - c) Gastroesophageal reflux disease
  - d) Peptic ulcer disease
10. Heart pace maker is device that falls under
- a) Preventive devices
  - b) Comprehensive devices
  - c) Rehabilitative devices
  - d) Prosthetic devices

**PART II: SHORT STRUCTURED QUESTIONS (20 MARKS)**

- a) Outline three benefits of using plain X-rays (3 marks)
- b) List the reasons why Personal Computers (PC) medical instruments are gaining popularity (3 marks)
- c) Explain two contrasts materials used for GI exams (2 marks)
- d) Explain patient factors to be considered in GI fluoroscopy (3 marks)
- e) Write the following abbreviations in full as used in medical instrumentation (3 marks)
  - i) CT
  - ii) ECG
  - iii) MRI
- f) Medical devices could generally be divided into two. Explain the two classes any medical device could fall into (3 marks)
- g) Explain the categories of measurement in the use of medical instrument (3 marks)

**SECTION B: ANSWER ANY TWO QUESTIONS. EACH QUESTION IS 20 MARKS**

**QUESTION TWO (20 MARKS)**

- a) Describe the various types of medical equipment/devices giving an example in each (10 marks)
- b) Describe safety requirements as stipulated by WHO for the various players in the manufacture and use of medical devices (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Describe the basic components of biomedical systems (10 marks)
- b) You are selected to be part of a medical device purchase committee for a hospital that sees many road traffic accidents cases. Giving reasons, explain the devices you would recommend. (10 marks)

**QUESTION FOUR (20 MARKS)**

- a) Explain the various medical equipment used for cardiovascular and respiratory assessment (10 marks)
- b) Discuss the various imaging equipment highlighting a condition each of them may be applied (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Discuss disposable medical equipment found within any medical facility. (10 marks)
- b) Various medical devices may be used for treatment of various conditions. Explain such medical devices while highlighting their use (10 marks)