

DIPLOMA IN BIOMEDICAL ENGINEERING TECHNOLOGY

LEVEL 6 YEAR II EXAMINATION

FINAL INTEGRATED SUMMATIVE EXAMINATION

SITTING: JULY AUGUST 2026

SUBJECT: MEDICAL EQUIPMENT MANAGEMENT AND MAINTENANCE

TIME: THREE (3) HOURS **TOTAL MARKS: 100**

PASS MARK: 50

INSTRUCTIONS TO CANDIDATE

1. Write your Examination number and National Registration Card (NRC) number on the answer booklet provided. Ensure you append your signature in the space provided on the answer booklet.
2. Write the ANSWER SCRIPT SERIAL NUMBER on the examination register and on the entry slip.
3. This paper has TWO (2) Sections.
   - Answer ALL questions in section A
   - Answer FIVE (5) questions in Section B. Question one (1) is compulsory then answer any other four (4) questions from the remaining six (6) questions.
4. Diagrams may be used where necessary to clarify your answer.
5. Cell phones and programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

SECTION A: MULTIPLE CHOICE QUESTIONS **TOTAL MARKS: 20**

ANSWER ALL QUESTIONS BY CHOOSING THE BEST OPTION.

1. Which of the following information is not necessary in an equipment inventory register?

   A. Serial number
   B. Manufacturer
   C. Model number
   D. Equipment life span

2. Why is it important to plan before procuring medical equipment?

   A. Increase equipment number per department
   B. Ensure compatibility with hospital needs
   C. Prevent delay in procurement
   D. Source for affordable suppliers of equipment

3. When is the acceptance testing performed?

   A. Before procurement approval
   B. After every preventive maintenance activity
   C. After installation and before clinical use
   D. During equipment user training

4. Which of the following activity/activities can be classified under preventive maintenance?

   A. Replacing worn-out filters
   B. Repairing burnt circuit board
   C. Decommissioning obsolete equipment
   D. Commissioning the equipment

5. A defibrillator tester is mainly used to verify:

   A. Equipment operating temperature
   B. Delivered defibrillation energy
   C. Defibrillator's internal resistance
   D. Defibrillator circuit

6. _____ is a factor that contributes to shortened equipment lifespan.

   A. Lack of internal equipment resistance
   B. Lack of scheduled maintenance
   C. User training conduction
   D. Equipment type

7. Which instrument is suitable for checking leakage current?

   A. Safety analyzer
   B. Oscilloscope
   C. Digital multi-meter
   D. Line tester

8. Lead time in spare-parts management refers to:

   A. Time taken to dispose equipment when spare cannot be found
   B. Time taken for spares to be procured
   C. Time taken for spares to deplete completely
   D. Time between ordering and receiving spare parts

9. Which disposal method is most appropriate for equipment containing hazardous materials?

   A. Open dumping
   B. Controlled disposal according to safety regulations
   C. Burying at designated sites
   D. Equipment incineration

10. Budgeting for medical equipment management should include:

    A. Equipment purchase price only
    B. Maintenance and training costs
    C. Equipment transportation cost only
    D. Repair costs

11. The most important factor when selecting medical equipment suppliers is:

    A. Storage space
    B. Supplier address
    C. Technical support capability
    D. Distance from the suppliers

12. A comprehensive maintenance contract usually covers:

    A. Procurement costs
    B. Labour, spare parts, and preventive maintenance
    C. Installation costs
    D. Training costs

13. Which information is most essential in maintenance records?

    A. Technician's preference tools
    B. Nature of fault and corrective action
    C. Equipment name
    D. Location of equipment

14. Which of the following is not included in equipment specifications?

    A. Power requirements
    B. Environmental operating conditions
    C. Clinical application
    D. Equipment life span

15. The primary purpose of equipment calibration certificates is to:

    A. Fill workshop files
    B. Provide evidence of measurement accuracy
    C. Increase supplier customers
    D. Replace maintenance logs

16. What are the consequences of poor keeping of maintenance documentation?

    A. Improved troubleshooting
    B. Poor tracking of equipment faults
    C. Increased equipment lifespan
    D. Reduced downtime

17. The best method for reducing procurement errors is to:

    A. Concentrate on technical specifications only
    B. Involve end users and BMETs in selection
    C. Increase suppliers
    D. Concentrate on supplier evaluation

18. Which of the following maintenance activities does not improves patient safety?

    A. Decommissioning of equipment
    B. Electrical safety testing
    C. Medical equipment regular inspection
    D. User training

19. A biomedical engineering technologist should verify utility requirements during installation because:

    A. Equipment may fail under unsuitable utilities
    B. Equipment may increase utility needs
    C. Equipment may reduce utility needs
    D. Equipment may over perform under unstable utilities

20. Which statement best describes effective medical equipment management?

    A. Purchasing equipment
    B. Coordinated management throughout the equipment life cycle
    C. Repairing equipment after failure
    D. Concentrating on maintenance activities

SECTION B: **TOTAL MARKS: 80**

THERE ARE SEVEN (7) QUESTIONS IN THIS SECTION, ANSWER FIVE (5) QUESTIONS. QUESTION ONE (1) IS COMPULSORY.

QUESTION 1 (COMPULSORY)

a) Define the term 'medical equipment inventory'. [2 marks]
b) State **six (6)** types of information that should be recorded during an inventory of medical equipment. [6 marks]
c) Explain **three (3)** steps involved when planning for acquisition of new medical equipment in a hospital. [6 marks]
d) Describe **three (3)** stages in the life cycle management of medical equipment in hospitals. [6 marks]

[TOTAL MARKS 20]

QUESTION 2

a) Define the term 'commissioning of medical equipment'. [2 marks]
b) List **three (3)** activities carried out during installation of medical equipment. [3 marks]
c) Explain **three (3)** tests that are carried out during equipment commissioning. [6 marks]
d) Describe **two (2)** problems that may arise if medical equipment is used before proper commissioning. [4 marks]

[TOTAL MARKS 15]

QUESTION 3

a) State **five (5)** pieces of information captured after conducting corrective maintenance. [5 marks]
b) Explain **five (5)** steps to take when troubleshooting medical equipment. [10 marks]

[TOTAL MARKS 15]

QUESTION 4

a) Define the 'term medical equipment decommissioning'. [2 marks]
b) State **three (3)** reasons for removing medical equipment from service. [3 marks]
c) Explain **two (2)** procedures followed when disposing of medical equipment safely. [4 marks]
d) Describe **two (2)** environmental or safety considerations when disposing of medical equipment. [6 marks]

[TOTAL MARKS 15]

QUESTION 5

a) List **five (5)** pieces of information captured in the service history file. [5 marks]
b) Explain the use of the following record files maintained by biomedical engineering professionals:
   i) Service history file. [2 marks]
   ii) Preventive maintenance checklist. [2 marks]
   iii) Job requisition form. [2 marks]
   iv) Acceptance record form. [2 marks]
   v) Inventory. [2 marks]

[TOTAL MARKS 15]

QUESTION 6

a) What is procurement.? [2 marks]

b) State **five (5)** advantages of quotation-based procurement. [5 marks]

c) Explain the following models of procurement:

i) Centralised procurement. [2 marks]

ii) Decentralised procurement. [2 marks]

iii) Group procurement. [2 marks]

iv) Mixed Procurement. [2 marks]

[TOTAL MARKS 15]

QUESTION 7

a) Define the term 'tender' [2 Marks]

b) List **five (5)** characteristics of a tender process. [5 Marks]

c) State **eight (8)** stages to be specified in the evaluation and criteria bid award during a tender procedure. [8 Marks]

[TOTAL MARKS 15]