Reg. No. : | | | | | | | | | | | | |

Question Paper Code: 1217239

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Seventh Semester
Biomedical Engineering
U20BM703 – MEDICAL EQUIPMENT MAINTENANCE AND TROUBLESHOOTING
(Regulation 2020)

Time: Three Hours | Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Why is grounding essential in electrical systems, and how is it tested?

2. Identify the reasons why it is important to test the insulation of electrical cables using a Megger.

3. What is the difference between analog and digital sensor probes?

4. How does a fuse differ from a circuit breaker in terms of protecting a circuit?

5. Which specific parameters are necessary to ensure the proper functioning of a heart-lung machine during surgery?

6. State the need to test the air detector in a dialyzer machine.

7. Recall the common faults that can occur in an X-ray machine.

8. Write short notes on International standards for Medical equipment.

9. How does replacement analysis help in deciding between repairing or replacing medical equipment?

10. What strategies can be implemented to extend the life of medical equipment?

PART – B (5 x 16 = 80 Marks)

11. (a) Discuss the different types of circuit breakers based on their construction and applications. (16)

(OR)

(b) Explain the importance of earthing in electrical installations. Discuss different types of earthing systems and their applications. (16)

12. (a) Describe the process of testing a DC power supply, including load testing, voltage ripple measurement, and thermal testing. Explain how these tests ensure reliable operation and identify potential issues in power supply performance. (16)

(OR)

(b) What are the key electrical safety protocols that must be followed during the installation and maintenance of electrical circuits? (16)

13. (a) Describe the functions, operating procedures, testing methods, and maintenance protocols of surgical lights. (16)

(OR)

(b) Explain as how the quality and reliability is ensured in maintenance of anesthesia machine. (16)

14. (a) Explain the role of ECG recorders in monitoring heart activity and describe the common problems encountered during their operation. (16)

(OR)

(b) Describe the methods of medical equipment maintenance required to keep infusion pumps functioning reliably. (16)

15. (a) Discuss preventive and corrective maintenance and the importance of service contracts in managing costs and equipment reliability. (16)

(OR)

(b) "Using a case study, analyze the life cycle management of a specific piece of medical equipment (e.g., MRI machine). (16)

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