



BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Sc.(OTT)-2021/B.Sc.(OTT)-2022/B.Sc.(OTT)-2023

Course Name – Electronics and Technology in Surgery and Anesthesia

Course Code - BOTT602

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the primary purpose of an electrocautery machine in an operation theater.
 - a) Cutting tissues
 - b) Controlling bleeding
 - c) Monitoring vital signs
 - d) Sterilizing instruments
- (ii) State the importance of an anesthesia machine during surgical procedures.
 - a) Maintaining a sterile environment
 - b) Controlling infection
 - c) Administering anesthesia gases
 - d) Monitoring patient's heart rate
- (iii) Identify the technology used for visualizing the internal organs during surgery.
 - a) Endoscope
 - b) Stethoscope
 - c) Microscope
 - d) Ultrasound machine
- (iv) Select the term for a device used to control the concentration of inhaled anesthetic gases.
 - a) Vaporizer
 - b) Nebulizer
 - c) Incubator
 - d) Radiator
- (v) State the primary purpose of a laminar airflow system in an operation theater.
 - a) Enhancing lighting
 - b) Controlling air quality
 - c) Reducing noise
 - d) Monitoring temperature
- (vi) Enumerate the components of a defibrillator.
 - a) Paddles, cables, display
 - b) Buttons, sensors, battery
 - c) Screen, keyboard, printer
 - d) Antennas, lights, alarms
- (vii) Locate the device responsible for removing excess fluid and blood during surgery.
 - a) Suction machine
 - b) Nebulizer
 - c) Infusion pump
 - d) Autoclave
- (viii) List one application of pressure transducers in surgery.
 - a) Monitoring blood oxygen levels
 - b) Measuring intraocular pressure
 - c) Assessing bone density
 - d) Controlling heart rate

- (ix) Cite an example of personal protective equipment (PPE) used for electrical safety.
 - a) Safety goggles
 - b) Steel-toed boots
 - c) Earplugs
 - d) Hard hat
- (x) Discuss the significance of pacemakers in managing heart arrhythmias.
 - a) Low
 - b) Moderate
 - c) High
 - d) Negligible
- (xi) Discuss the role of monitors in detecting abnormal heart rhythms during surgery.
 - a) Enhancing lighting
 - b) Monitoring vital signs
 - c) Providing illumination
 - d) Controlling bleeding
- (xii) Indicate the significance of indenting in maintaining inventory control in the operation theater.
 - a) Enhancing patient comfort
 - b) Ensuring proper documentation
 - c) Monitoring vital signs
 - d) Administering medications
- (xiii) Recognize the importance of data backup in computer security practices.
 - a) Enhancing system performance
 - b) Preventing data loss
 - c) Decreasing network speed
 - d) Improving internet connectivity
- (xiv) Tell CVT stands for:
 - a) Constant Voltage Transformer
 - b) Current Voltage Timer
 - c) Control Voltage Tool
 - d) Central Voltage Transformer
- (xv) state that external pacemaker delivers:
 - a) Ultrasound
 - b) Electrical impulses
 - c) Oxygen
 - d) Drugs

Group-B

(Short Answer Type Questions)

3 x 5=15

- 2. Research recent advancements in surgical diathermy technology, including innovations in energy delivery systems, tissue effects, and safety features. (3)
- 3. Discuss the importance of ongoing training and simulation exercises for healthcare providers in mastering defibrillator use and resuscitation techniques. (3)
- 4. Develop a comprehensive protocol for the safe and effective use of suction machines in the operating theatre, emphasizing infection control measures and equipment maintenance. (3)
- 5. Illustrate the function and significance of pressure transducers in monitoring vital signs and hemodynamic parameters during surgical procedures and critical care settings. (3)
- 6. Justify the uses of Boyle's apparatus. (3)

OR

Describe the basic functions of an anesthesia machine. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

- 7. Describe the ergonomic design considerations and functional features of state-of-the-art OT tables, emphasizing their pivotal role in ensuring patient comfort, accessibility, and safety during surgical interventions. (5)
- 8. Discuss the imperative of seamless coordination among all personnel operating within the confines of the operating theatre, highlighting its significance in optimizing workflow efficiency, patient safety, and surgical outcomes while fostering a culture of interprofessional collaboration and mutual respect. (5)
- 9. Describe management of operation theatre during routine surgical procedures. (5)
- 10. Support the importance of proper electrode placement techniques in clinical settings, discussing their impact on the quality and accuracy of physiological monitoring and therapeutic interventions. (5)

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11. Analyze the role of suction machines in modern surgical procedures and elucidate their significance in maintaining a sterile operating environment and ensuring optimal visibility for surgeons during critical interventions. (5)
 12. Contrast the mechanisms of action and therapeutic applications of pacemakers versus stimulators in managing cardiac arrhythmias and neurological disorders, emphasizing differences in implantation techniques, device programming, and long-term patient management strategies. (5)

OR

Criticize the challenges associated with coordinating with diverse personnel within the operation theatre, highlighting issues related to communication barriers, role ambiguity, and interdisciplinary conflicts, and proposing strategies for fostering effective teamwork and collaboration. (5)

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