



BRAINWARE UNIVERSITY

Term End Examination 2024-2025

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

Course Name – Electronics and Technology in Surgery and Anesthesia

Course Code - BOTTS602

(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) Select the correct term for a device that measures the oxygen concentration in a patient's blood.
 - a) ECG
 - b) Oximeter
 - c) MRI
 - d) Ventilator
- (ii) Recall a safety precaution associated with the use of OT lights.
 - a) Ensuring proper grounding
 - b) Regular calibration
 - c) Frequent repositioning
 - d) Adjusting brightness manually
- (iii) Select the term for a device used to control the concentration of inhaled anesthetic gases in anesthesia machines.
 - a) Vaporizer
 - b) Nebulizer
 - c) Pacemaker
 - d) Stimulator
- (iv) Identify the moral duty of an operation theater technologist to prioritize patient safety above all else.
 - a) Empathy
 - b) Integrity
 - c) Professionalism
 - d) Efficiency
- (v) Discover the ethical obligation of an operation theater technologist to report any negligence or errors in patient care.
 - a) Empathy
 - b) Integrity
 - c) Professionalism
 - d) Efficiency
- (vi) Select the term for the moral duty of an operation theater technologist to prioritize patient safety above all else.
 - a) Empathy
 - b) Integrity
 - c) Professionalism
 - d) Efficiency
- (vii) State the purpose of logging off from a computer system when not in use.
 - a) Protecting patient confidentiality
 - b) Enhancing computer performance
 - c) Decreasing energy consumption
 - d) Improving internet speed

- (viii) Identify the concept related to ensuring that only authorized users can access sensitive information on a computer system.
- | | |
|--------------------|----------------|
| a) Logging off | b) Encryption |
| c) Word processing | d) Spreadsheet |
- (ix) Choose the appropriate action when sending confidential patient information via email.
- | | |
|--------------------------------|--|
| a) Use unsecured email | b) Encrypt the email |
| c) Share the password publicly | d) Share the information on social media |
- (x) Identify the primary function of antivirus software in computer security.
- | | |
|-------------------------------|---------------------------------|
| a) Enhancing internet speed | b) Preventing hardware failure |
| c) Protecting against malware | d) Improving system performance |
- (xi) Identify the security measure that prevents unauthorized access to a computer network.
- | | |
|-------------------|--------------------------|
| a) Firewall | b) Spreadsheet |
| c) Word processor | d) Presentation software |
- (xii) State the importance of logging off from a computer system after completing tasks.
- | | |
|---------------------------------------|-----------------------------------|
| a) Protecting patient confidentiality | b) Enhancing computer performance |
| c) Decreasing energy consumption | d) Improving internet speed |
- (xiii) Identify the concept related to securing data by converting it into a code that can only be accessed by authorized users.
- | | |
|--------------------|----------------|
| a) Logging on | b) Encryption |
| c) Word processing | d) Spreadsheet |
- (xiv) Recognize the importance of regular software updates in maintaining computer security.
- | | |
|----------------------------|--------------------------------------|
| a) Reducing system storage | b) Increasing vulnerability |
| c) Improving system speed | d) Patching security vulnerabilities |
- (xv) Choose the appropriate scenario where encryption would be necessary in email communication.
- | | |
|---|-------------------------------|
| a) Sending a personal greeting | b) Sharing public information |
| c) Transmitting sensitive medical records | d) Forwarding a newsletter |

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Define the role of defibrillators in cardiac resuscitation protocols, outlining their function and application in emergency situations. (3)
3. Express the significance of proper indenting procedures in operation theaters, illustrating the impact of efficient inventory management on patient safety, cost-effectiveness, and workflow efficiency. (3)
4. Illustrate computer data processing in operation theaters, highlighting its role in electronic health records (EHRs), digital imaging, and information management systems for efficient workflow, data analysis, and decision support. (3)
5. Define the role of defibrillators in cardiac resuscitation protocols and explain the importance of early defibrillation in improving survival rates following cardiac arrest. (3)
6. Evaluate the different types of electrodes used in medical procedures and their applications in diagnostic and therapeutic interventions. (3)

OR

Classify strategies for avoiding the misuse of defibrillators and ensuring their safe and effective use by trained medical personnel. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Analyze the physiological and psychological impacts of prolonged surgical procedures on patients, considering factors such as anesthesia duration, intraoperative stressors, and postoperative recovery trajectories, and proposing strategies for optimizing perioperative care to mitigate adverse outcomes and enhance patient well-being. (5)
8. Criticize the ethical implications of resource allocation decisions in the operation theatre, highlighting dilemmas related to scarcity, prioritization, and distributive justice, and proposing ethical frameworks and decision-making processes to guide equitable and transparent allocation of surgical resources. (5)
9. Indicate the key components and functionalities of modern pacemakers, delineating their pivotal role in managing cardiac arrhythmias and enhancing patients quality of life through advanced pacing algorithms and remote monitoring capabilities. (5)
10. Report on the key functions and benefits of suction machines in operation theaters, illustrating their role in maintaining a clear surgical field, reducing contamination risks, and optimizing surgical outcomes. (5)
11. Complete a comprehensive review of the key features and functionalities of OT (Operating Theater) tables, outlining their role in facilitating surgical procedures and patient positioning, as well as the importance of customization and adaptability for different surgical specialties. (5)
12. Analyze the physiological aspects of patients undergoing surgical interventions, elucidating the systemic responses, perioperative considerations, and complications associated with anesthesia administration, hemodynamic instability, and surgical stressors. (5)

OR

Contrast the functionalities and features of hospital information systems (HIS) versus electronic medical records (EMR) platforms, highlighting differences in scope, scalability, interoperability, and regulatory compliance requirements. (5)

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