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BRAINWARE UNIVERSITY

Term End Examination 2025-2026

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

Course Name – Advance Anesthetic Techniques

Course Code - BOTT503

(Semester V)

Library
Brainware University
398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125

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) State the primary function of cardiac contractility.

- | | |
|-------------------------------|--|
| a) Maintaining heart rate | b) Generating force and contracting the heart muscle |
| c) Pumping blood to the lungs | d) Regulating blood pressure |

(ii) State that What does stroke volume measure?

- | | |
|--|--------------------------------|
| a) Heart rate | b) Blood pressure |
| c) Volume of blood ejected by the left ventricle per contraction | d) Oxygen content in the blood |

(iii) Select the primary role of intercalated discs in cardiac muscle.

- | | |
|--------------------------------------|--------------------------------------|
| a) Storage of calcium ions | b) Mechanical strength and stability |
| c) Generation of electrical impulses | d) Facilitation of oxygen exchange |

(iv) Write down the impact of positive pressure ventilation on the work of breathing.

- | | |
|-----------------------------------|--------------------------------|
| a) Increased airway resistance | b) Reduced respiratory effort |
| c) Impaired chest wall compliance | d) Elevated oxygen consumption |

(v) Select the type of arrhythmia that may lead to a higher risk of stroke:

- | | |
|----------------------------|---------------------------------------|
| a) Ventricular tachycardia | b) Atrial fibrillation |
| c) Sinus tachycardia | d) Premature ventricular contractions |

(vi) Write the primary indication for mechanical ventilation in a patient with neuromuscular disorders.

- | | |
|----------------------------------|------------------------------------|
| a) Hypoxemic respiratory failure | b) Hypercapnic respiratory failure |
| c) Apnea | d) Trauma |

(vii) Select the drug class primarily used to treat ventricular tachycardia:

- | | |
|-------------------|-----------------------------|
| a) Beta-blockers | b) Calcium channel blockers |
| c) Anticoagulants | d) Diuretics |

(viii) Report that what does SIMV stand for in the context of mechanical ventilation.

- a) Synchronized Intermittent Mandatory Ventilation
 b) Synchronized Inspiratory Mandatory Ventilation
 c) Spontaneous Inspiratory Mandatory Ventilation
 d) Standard Intermittent Mandatory Ventilation
- (ix) Write that what should be adjusted to achieve adequate minute ventilation based on the patient's oxygenation and ventilation requirements?
 a) Inspiratory Pressure Limit
 b) Inspiratory-to-Expiratory (I:E) Ratio
 c) Respiratory Rate
 d) Tidal Volume
- (x) Select that which unit is used to measure the flow rate of oxygen.
 a) L/min
 b) % concentration
 c) PaO₂
 d) mL/kg
- (xi) Choose that which oxygen delivery device is color-coded for specific oxygen concentrations.
 a) Simple face mask
 b) Nasal cannula
 c) Venturi mask
 d) Non-rebreather mask
- (xii) Choose action that should be taken to prevent drying and irritation of the airways during oxygen therapy.
 a) Increase the oxygen flow rate
 b) Use a high-flow nasal cannula
 c) Administer humidified oxygen
 d) Decrease the oxygen concentration
- (xiii) Choose the primary goal of renal compensation in acid-base balance.
 a) To control blood pressure
 b) To maintain electrolyte balance
 c) To normalize acid-base parameters
 d) To assess fluid intake
- (xiv) Discuss how can ventricular tachycardia be diagnosed.
 a) Blood test
 b) Chest X-ray
 c) Echocardiogram
 d) Electrocardiogram (ECG)
- (xv) Select the primary cause of ventricular tachycardia.
 a) Oxygen deficiency
 b) Electrical disturbances
 c) Bacterial infection
 d) Genetic mutations

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain the primary indications for mechanical ventilation. (3)
3. Explain the main objective of recruitment maneuvers during mechanical ventilation, and when are they typically performed? (3)
4. Describe the management of heart failure. (3)
5. Examine the role of capnography in acid-base monitoring during anesthesia. (3)
6. Analyze the importance of monitoring and assessment during mechanical ventilation, emphasizing the parameters that should be closely observed and their implications for patient care. (3)

OR

Analyze the key differences between Pressure Support (PS) mode and Synchronized Intermittent Mandatory Ventilation (SIMV) mode in mechanical ventilation. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Analyze a comprehensive plan for managing a patient with severe hyperkalemia during surgery. (5)
8. Critically analyze the role of compensatory mechanisms in addressing acid-base disturbances during anesthesia. (5)
9. Explain the impact of advancements in ventilator technology on patient outcomes and the role of healthcare professionals in optimizing their use. (5)

10. Describe different ECG leads and their placement. (5)
11. Analyze the pathophysiology of heart failure and outline its management. (5)
12. Analyze the relationship between Positive End-Expiratory Pressure (PEEP) levels and lung compliance in mechanical ventilation. (5)

OR

Analyze the key considerations and potential complications associated with Recruitment Maneuvers in mechanically ventilated patients. (5)

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