



**AMREF INTERNATIONAL UNIVERSITY
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES
END OF SEMESTER DECEMBER 2023 EXAMINATIONS
HIGHER DIPLOMA IN CRITICAL CARE NURSING**

COURSE CODE AND TITLE: ACN 120 ESSENTIALS OF CRITICAL CARE NURSING

DATE: 13TH DECEMBER 2023

Duration: 2 HOURS

Start: 11:15 AM

Finish: 1:15 PM

INSTRUCTIONS

- 1. This exam is out of 100 marks**
- 2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (60 marks) and Section II: Short Answer Questions (40 marks)**
- 3. Answer ALL Questions.**
- 4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.**

SECTION I: MULTIPLE CHOICE QUESTIONS

(60 MARKS)

1. Class IV antiarrhythmic include
 - A. Sotalol
 - B. Procainamide
 - C. Lidocaine
 - D. Verapamil
2. Calcium channel blockers work in what phase of the cardiac cycle.
 - A. Phase I
 - B. Phase II
 - C. Phase III
 - D. Phase IV.
3. The drug to be used cautiously in a known asthmatic patient, presenting with an atrial flutter is: -
 - A. Verapamil
 - B. Procainamide
 - C. Propranolol
 - D. Flecainide
4. The type of shock in a patient admitted in ICU post-surgery in severe shock after getting spinal anesthesia with no major blood loss is: -
 - A. Septic Shock
 - B. Distributive shock
 - C. Hypovolemic Shock
 - D. Obstructive shock
5. Ventricular Tachycardia is likely to cause: -
 - A. Obstructive Shock
 - B. Neurogenic shock
 - C. Cardiogenic shock
 - D. Distributive shock

6. A hyper-acute T wave is present in: -
 - A. hyperkalemia
 - B. hypokalemia
 - C. the early stages of acute myocardial infarction.
 - D. hypocalcemia
7. The P wave represents: -
 - A. Atrial repolarization
 - B. Atrial depolarization
 - C. Ventricular depolarization
 - D. Ventricular repolarization
8. A standard ECG machine will be calibrated to record at a speed of: -
 - A. 25mm/sec
 - B. 50mm/sec
 - C. 30 mm/sec
 - D. 40mm/sec
9. In the Sino Atrial Node, failure of the P cells leads to:
 - A. Sinus arrest
 - B. Sinus arrhythmia
 - C. Sino atrial exit block
 - D. Atrial Fibrillation
10. In the Sino Atrial Node, failure of the T cells leads to: -
 - A. Sinus arrest
 - B. Sinus arrhythmia
 - C. Sino atrial exit block
 - D. Atrial Fibrillation
11. The following CVC insertion sites carries the highest risk for a pneumothorax and air embolism: -
 - A. Femoral access
 - B. Internal Jugular access
 - C. Subclavian access
 - D. Brachial access

12. The following CVP waveform correlates with closure of the tricuspid valve: -
- A. A wave
 - B. C wave
 - C. X descent
 - D. V wave
13. The CVP waveforms that correlates with right atrial filling is: -
- A. A wave
 - B. C wave
 - C. X descent
 - D. V wave
14. The CVP waveforms that reflects atrial contraction is: -
- A. A wave
 - B. C wave
 - C. X descent
 - D. V wave
15. One of the following is an indication of sepsis: -
- A. Systolic blood pressure <120
 - B. Heart rate > 80
 - C. Temperature > 37.5 degrees Celsius
 - D. Lactic acidosis
16. The vulnerable period during the cardiac cycle is: -
- A. At the peak of of the R wave
 - B. At the peak of the P wave
 - C. From the pick of the R wave to the mid T wave
 - D. From mid T wave to the end of the T wave
17. Stroke volume is a function of: -
- A. Contractility, heart rate, afterload
 - B. Preload, blood pressure, heart rate
 - C. Contractility, afterload, preload
 - D. Preload, blood pressure, contractility

18. An indication for intra-aortic balloon pump (IABP) is:
- A. Congestive heart failure
 - B. Cardiogenic shock
 - C. Pulmonary embolism
 - D. Aortic insufficiency
19. The second (2nd) heart sound “dub” is produced by closure of the:
- A. Atrio-ventricular valves
 - B. Aortic valves
 - C. Semi-lunar valves
 - D. Mitral valves
20. The layer of the coronary artery affected during an aortic dissection is: -
- A. Tunica adventitia
 - B. Tunica media
 - C. Tunica intima
 - D. Endothelium
21. The nurse is assessing a patient who had craniotomy three days prior. The nurse would suspect the patient of developing meningitis if they exhibit:
- A. A negative Kernig’s sign
 - B. Absence of nuchal rigidity
 - C. A positive Brudzinkin’s sign
 - D. A Glasgow coma scale score of 15
22. The confirmatory assessment test in a patient with impairment in cranial nerve II is: -
- A. Corneal reflex
 - B. Pupil response to light
 - C. Six cardinal fields of gaze
 - D. Pupils response to light and accommodation
23. Multiple sclerosis:
- A. Is characterized by progressive loss of myelin
 - B. Is characterized by progressive loss of melanin
 - C. Is associated with an autoimmune response following a bacterial infection
 - D. Has no recognized triggers

24. The normal response to striking the triceps tendon with a reflex hammer is;
- A. Forearm pronation
 - B. Flexion of the arm at the elbow
 - C. Extension of the arm
 - D. Flexion and supination of the elbow
25. Following a lumbar puncture, the nurse should assess the patient for;
- A. Headache
 - B. Allergic reactions to the dye
 - C. Lower limb paralysis
 - D. Hemorrhage from the puncture site
26. When using intraventricular ICP monitoring, what should the nurse be aware of to prevent inaccurate readings?
- A. The P2 wave is higher than the P1 wave.
 - B. CSF is leaking around the monitoring device.
 - C. The transducer of the ventriculostomy monitor is at the level of the upper ear.
 - D. The drain of the CSF drainage device was closed for 6 minutes before taking the reading
27. The drug that helps to decrease ICP by expanding plasma and the osmotic effect to move fluid is: -
- A. Oxygen administration
 - B. Mannitol (Osmitrol) (25%)
 - C. Pentobarbital (Nembutal)
 - D. Dexamethasone (Decadron)
28. When assessing the body functions of a patient with increased ICP, the nurse should first assess for;
- A. Corneal reflex testing
 - B. Extremity strength testing
 - C. Pupillary reaction to light
 - D. Circulatory and respiratory status

29. The following mechanisms of injury commonly results in the tearing of the axons in the brain;
- A. Rotational injury
 - B. Acceleration injury
 - C. Deceleration injury
 - D. Penetrating injury
30. A patient is admitted with uncontrolled atrial fibrillation. The patient's medication history includes vitamin D supplements and calcium. The type of stroke this patient is MOST at risk for is: -
- A. Ischemic thrombosis
 - B. Ischemic embolism
 - C. Hemorrhagic
 - D. Ischemic stenosis
31. In order for tissue plasminogen activator (tPA) to be most effective in the treatment of stroke, it must be administered;
- A. 6 hours after the onset of stroke symptoms
 - B. 3 hours before the onset of stroke symptoms
 - C. 3 hours after the onset of stroke symptoms
 - D. 12 hours before the onset of stroke symptoms
32. You are assessing the client diagnosed with bacterial meningitis. The clinical manifestations that would support the diagnosis of bacterial meningitis is;
- A. Positive Babinski's sign and peripheral paresthesia.
 - B. Negative Chvostek's sign and facial tingling.
 - C. Positive Kerning's sign and nuchal rigidity.
 - D. Negative Trousseau's sign and nystagmus.
33. The type of precautions the nurse should implement for the client diagnosed with septic meningitis is;
- A. Standard Precautions.
 - B. Airborne Precautions.
 - C. Contact Precautions
 - D. Droplet Precautions

34. A client with subdural hematoma was given mannitol to decrease intracranial pressure (ICP). The following results would best show the mannitol was effective;
- A. Urine output increases
 - B. Pupils are 8 mm and nonreactive
 - C. Systolic blood pressure remains at 150 mm Hg
 - D. BUN and creatinine levels return to normal
35. The nurse understands that when the spinal cord is injured, ischemia results and edema occurs. How should the nurse explain to the patient the reason that the extent of injury cannot be determined for several days to a week?
- A. "Tissue repair does not begin for 72 hours."
 - B. "The edema extends the level of injury for two cord segments above and below the affected level."
 - C. "Neurons need time to regenerate so stating the injury early is not predictive of how the patient progresses."
 - D. "Necrosis of gray and white matter does not occur until days after the injury."
36. A patient being mechanically ventilated receives midazolam (Versed) for sedation. The findings that indicate to you that the patient is receiving an appropriate dose of this medication is;
- A. Asleep but withdrawing from noxious stimuli with a heart rate of 80
 - B. Awake with a respiratory rate of 38 and a heart rate of 132
 - C. Asleep but awakening to light touch with a heart rate of 72
 - D. Awake with a heart rate of 124 and attempting to pull out the IV
37. The client has sustained a severe closed head injury and the neurosurgeon is determining if the client is brain dead. Which data support that the client is brain dead?
- A. The clients head is turned to the right, the eyes turn to the right.
 - B. The EEG has identifiable waveforms.
 - C. There is no Eye activity when the cold caloric test is performed.
 - D. The client assumes decorticate posturing when painful stimuli are applied.

38. A female client has experienced an episode of myasthenic crisis. The nurse would assess whether the client has precipitating factors such as:
- A. Getting too little exercise
 - B. Taking excess medication
 - C. Omitting doses of medication
 - D. Increasing intake of fatty foods
39. A client with a diagnosis of Guillain-Barre syndrome is scheduled to receive plasmapheresis treatments. A nurse explains to the client's spouse that the purpose of the plasmapheresis is to:
- A. Remove excess fluid from the bloodstream
 - B. Restore protein levels in the blood
 - C. Remove circulating antibodies from the bloodstream
 - D. Infuse lipoproteins to restore the myelin sheath
40. Which of the following spinal cord injury patient requires long term mechanical ventilation?
- A. C1-C2
 - B. C6-C7
 - C. T1-T5
 - D. All patients with spinal cord injury require long term mechanical ventilation
41. The findings for a blood gas show a Ph 7.47, PaCO₂ 40, HCO₃ 28mmol/L, BE of +4meq/L. This indicates: -
- A. Metabolic alkalosis
 - B. Metabolic acidosis
 - C. Respiratory alkalosis
 - D. Respiratory acidosis
42. During endotracheal suction, the point of resistance encountered upon inserting suction tube is the: -
- A. Carina
 - B. Hilum
 - C. Bronchi
 - D. Alveolar
43. The lung capacity that keep the alveolar inflated at the end of expiration is the:-
- A. Expiratory reserve capacity
 - B. Total lung capacity
 - C. Functional residual capacity
 - D. Inspiratory capacity

44. During external respiration: -
- A. Inspired air is channeled into the alveoli
 - B. Inspired oxygen diffuses across respiratory membrane into pulmonary capillary
 - C. Carbon dioxide is transported from systemic circulation into pulmonary capillary bed
 - D. Oxygen in the plasma diffuses into the tissues and cells
45. Indicate whether the following statement is True/False
- A. Pleural friction rub is heard after cessation of breathing
 - B. Patient with a wheeze may indicate obstruction in the larynx -
46. Chest X-ray findings in a patient with COPD include
- A. Flattening of the diaphragm
 - B. Elevated hemi-diaphragm
 - C. Increased radiolucency
 - D. Sharpening of costophrenic angles
47. Oxygen toxicity affects pulmonary system by: -
- A. Increasing oxygen free radicals
 - B. Increasing mucus production
 - C. Increasing surfactant production
 - D. Increasing cilia mobility
48. During fibrotic stage of ARDS: -
- A. It occurs between 7-8 days after initial attack.
 - B. There is marked lung tissue improvement
 - C. Numerous connective tissues continue to destroy the lung
 - D. Hypoxemia is most severe following lung tissue injury
49. Avoiding "Auto PEEP" in permissive hypercapnia is achieved by: -
- A. High minute ventilation
 - B. High Tidal volume
 - C. Low FI02
 - D. Increased respiratory rate
50. The hallmark of Acute respiratory failure is?
- A. V/Q Mismatch
 - B. pulmonary shunting
 - C. Hyperemia
 - D. Hypocapnia
51. When the mechanical defense system of the upper airway is disrupted in acute pneumonia: -
- A. The alveoli sacs are filled with fluid
 - B. Air sac colonization is halted
 - C. There is no further consolidation of lung tissue
 - D. Alveoli inflammation is controlled

52. Mode of action of adrenaline in an asthmatic patient is: -
- A. Increase in microvascular leakage
 - B. Prevent bronco-constriction
 - C. Reduction of bronchial secretions
 - D. Eliminate the effects of the allergens
53. The appropriate endotracheal tube size for 6 years old is
- A. 3mm
 - B. 4mm
 - C. 5.5mm
 - D. 6.5mm
54. The cells that are found in the respiratory system are: -
- A. Pseudo stratified columnar epithelium
 - B. Stratified epithelium
 - C. Squamous epithelium
 - D. Stratified squamous epithelium
55. The role of type II alveoli cells is to
- A. Secrete surfactant
 - B. Form the part of alveoli wall
 - C. Protect the alveoli against invading microbes
 - D. Equalize air pressure throughout the lungs
56. In ventilation/perfusion relationship,
- A. Pulmonary capillary vasoconstriction occurs due alveolar hypoxia
 - B. There is increased capillary blood flow to the poorly ventilated alveolar.
 - C. Retained carbon dioxide in the alveoli causes vasodilation of pulmonary capillaries
 - D. Increased carbon dioxide levels in the alveoli causes constriction of the bronchioles.
57. On auscultating the patient's chest, a nurse noted high pitched musical sound on expiration. The nurse concludes that;
- A. The upper airway is obstructed with secretions
 - B. The patient's airway is patent.
 - C. The lower airway is narrowed.
 - D. There are retained secretions in the airway
58. Patient with asthmatic attack develops respiratory alkalosis due to
- A. Air trapping in the lower airways
 - B. Hyperventilation
 - C. Respiratory muscles fatigue
 - D. Prolonged inspiratory time

59. The appropriate adjustment on mechanical ventilation for a patient with an ABG showing pH 7.35, PaCO₂ 55mmHg, PaO₂ 80mmHg, HCO₃ 24mmol/Lis: -
- A. Increase FiO₂
 - B. Increase the respiratory rate
 - C. Maintain FiO₂
 - D. Increase PEEP
60. The possible cause of airway pressure of 36cmH₂O in a ventilated patient would be:
- - A. Tube kinking, presence of secretions
 - B. Wheezes, tube leakage
 - C. Reduced FiO₂, tube leakage
 - D. Increased respiratory rate, reduced FiO₂

SECTION II: SHORT ANSWER QUESTIONS

(40 MARKS)

1. Explain the pathophysiology of myasthenia gravis (5 marks)
2. Describe the Glasgow coma scale including the scoring (5 marks)
3. State five (5) physiological causes of sinus tachycardia (5 marks)
4. State five (5) characteristics of a sinus arrhythmia (5 marks)
5. State five (5) predictors of difficulty intubation using the mnemonic LEMON (5 marks)
6. State five (5) roles of a nurse during weaning stage from mechanical ventilator (5 marks)
7. State Five (5) negative impacts of hyperventilation during CPR (5 marks)
8. State five (5) qualities of a good team dynamic during CPR (5 marks)