



ENTRANCE EXAMINATION - ACADEMIC SESSION JANUARY 2020

DM / PDCC CARDIOTHORACIC AND VASCULAR ANAESTHESIA

Time:90 Minutes

100 MCQs

Max. Marks: 100

(Select the most appropriate answer)

(There are no negative marks for wrong answers)

1. The following are true for Dopamine EXCEPT
 - a) Increases cardiac output
 - b) In high doses causes peripheral vasodilatation
 - c) Increases renal blood flow
 - d) Increases splanchnic blood flow
2. Which is the pacemaker of the normal heart
 - a) SA node
 - b) AV node
 - c) Purkinje fibers
 - d) None of the above
3. The relationship of the femoral artery to the femoral vein in the femoral sheath is
 - a) Lateral
 - b) Medial
 - c) Anterior
 - d) Posteromedial
4. Aortic insufficiency is suggested by
 - a) Marked diastolic hypertension
 - b) Wide pulse pressure
 - c) Narrow pulse pressure
 - d) Systolic hypertension
5. Coronary artery blood flow is primarily controlled by
 - a) Myocardial oxygen supply
 - b) Oxygen tension
 - c) Myocardial oxygen demand
 - d) Carbon dioxide tension

6. Which of the following parameters measured by 2D- echocardiography assesses the systolic performance of the left ventricle
- Shortening fraction
 - Ejection fraction
 - Fractional area of change
 - All of the above
7. Which of the following is a vasopressor
- Milrinone
 - Dobutamine
 - Isoprenaline
 - Phenyleprine
8. Supraventricular tachycardia can be treated by all EXCEPT
- Valsalva maneuver
 - Intravenous Adenosine
 - Intravenous Lignocaine
 - Verapamil
9. Which is FALSE about cardiopulmonary resuscitation in an adult
- Adrenaline is the first drug of choice
 - Intra-cardiac adrenaline is not recommended
 - Ventricular fibrillation needs external defibrillation commencing at 50 J
 - External cardiac massage should depress the sternum by 2 inches
10. Four hours after abdominal surgery, the following hemodynamic parameters are recorded: HR: 128/min; BP: 86/50 mm Hg; Cardiac index: 1.9 L/min/m²; Stroke volume variation: 15%. What is the most appropriate treatment
- Dobutamine Infusion
 - Noradrenaline Infusion
 - Intravenous fluid bolus
 - Milrinone Infusion

11. A patient on permanent pacemaker is scheduled for elective surgery. Which of the following is NOT CORRECT regarding the perioperative management
- The type of pacemaker and pacemaker mode to be assessed before surgery
 - Decide whether the patient is pacemaker dependent or not
 - All patients require reprogramming of the pacemaker mode before surgery
 - Use bipolar cautery whenever possible
12. Which of the following statements is TRUE regarding the transversus abdominis plane (TAP) block using ultrasound-guided technique
- Coagulopathy is an absolute contraindication
 - Low volume, high concentration of local anaesthetic solution is used ideally
 - Saline can be used to identify and open the TAP fascial plane prior to injecting local anaesthetic
 - It can be reliably used as the sole mode of analgesia after abdominal surgery
13. In a neonate, the spinal cord extends to which vertebral level
- L1
 - T12
 - S3
 - L3
14. Independent risk factors for difficult mask ventilation include all of the following, EXCEPT
- Sleep apnea
 - Limited mandibular protrusion
 - Body mass index $< 21 \text{ kg/m}^2$
 - Age > 55 years
15. After one intravenous bolus, which of the following organs would receive the drug slowest
- Muscle
 - Fat
 - Liver
 - Heart

16. The primary determinant of local anesthetic potency is
- pKa
 - Molecular weight
 - Lipid solubility
 - Protein binding
17. The anaesthetic agent that should be avoided in patients with a history of seizure activity is
- Halothane
 - Isoflurane
 - Desflurane
 - Enflurane
18. In patients with an intact circulation, rapid infusion of intravenous amiodarone leads to
- Rapid restoration of native sinus rhythm and hemodynamic stability
 - Shortened refractory period
 - Hypotension and bradycardia
 - Increased speed of conduction in the sinoatrial node
19. Which of the following is a side effect of muscarinic acetylcholine receptors antagonists
- Dry mouth
 - Urinary retention
 - Blurred vision
 - All of the above
20. Which of the following fluid is associated with the highest incidence of anaphylactoid reactions
- Plasmalyte
 - Hypertonic saline (3% NaCl)
 - Hetastarch
 - Albumin 5%

21. You are performing an intrathecal injection. Clear CSF leaks out and confirms the correct location of needle tip. Which 2 membranes surround the space you are in
- Subcutaneous tissue and dura mater
 - Pia mater and arachnoid membrane
 - Dura mater and ligamentum flavum
 - Arachnoid and dura mater
22. Compliance of the lung will be decreased in the following conditions, EXCEPT
- Lung fibrosis
 - Obesity
 - Pleural thickening
 - ARDS
23. Serum sodium level is elevated in
- Diabetes insipidus
 - Cerebral salt wasting
 - SIADH (syndrome of inappropriate ADH secretion)
 - Hypervolemia
24. Which of the following drug does NOT prolong the QTc interval
- Ondansetron
 - Dolasetron
 - Droperidol
 - Palonosetron
25. The following medications used in MAC cases have an analgesic action EXCEPT
- Dexmedetomidine
 - Ketamine
 - Propofol
 - Sufentanil

26. Find the CORRECT statement on platelet transfusion
- Should be stored at room temperature
 - Should be refrigerated
 - Is indicated only when platelet count is below 50 thousand/100 ml
 - Should be transfused through fluid warmer
27. Pulmonary dead space decreases with which of the following
- Pulmonary embolism
 - Endotracheal intubation
 - Decreased cardiac output
 - Transfusion related acute lung injury (TRALI)
28. Regarding the supraclavicular brachial plexus block which of the following is FALSE
- The block is carried at the level of brachial plexus roots
 - A predictable dense block can be obtained within a short duration
 - Most of the motor and sensory innervation to upper limb is blocked
 - Landmark technique carries high risk of pneumothorax
29. Which of the following ion is NOT used in the calculation of strong ion difference (SID)
- Sodium
 - Potassium
 - Bicarbonate
 - Chloride
30. Regarding the airway of neonates which of the following is TRUE
- Large occiput provides natural state of cervical flexion
 - Even healthy neonates cannot coordinate both nasal and mouth breathing
 - Larynx is at the level of C4-C5
 - The vocal cord is the narrowest portion of the airway
31. The cardiovascular changes that occur in the neonate immediately after birth are
- Rise in peripheral vascular resistance
 - Fall in pulmonary vascular resistance
 - Fall in portal blood pressure
 - All of the above

32. Regarding the foetal circulation which of the following is TRUE
- a) Blood from the SVC flows into the LA via the foramen ovale
 - b) Stroke volume of foetal LV equals stroke volume of foetal RV
 - c) Blood from the IVC flows to the head vessels via the ductus arteriosus
 - d) Ductus venosus drains directly into the IVC
33. In the foetal circulation
- a) Highly oxygenated blood goes to heart and brain
 - b) About 30-40% of placental flow bypasses the liver
 - c) There are both intracardiac and extracardiac shunts
 - d) All of the above
34. Which equation best describes the relation between systemic vascular resistance (SVR) and cardiac output (CO)
- a) $SVR \times CO = MAP - CVP$
 - b) $SVR \times CO = MAP - PAP$
 - c) $SVR \times CO = MAP - LAP$
 - d) $SVR \times CO = \text{mean PAP} - LAP$
35. Pulmonary vascular resistance (PVR) is
- a) same as the SVR
 - b) influenced by alveolar oxygen tension
 - c) has a linear relationship with lung volumes
 - d) highest at functional residual capacity
36. Infusion of a large volume of 0.9 % saline is likely to cause which of the acid base abnormality
- a) Hyperchloremic metabolic acidosis
 - b) Hypochloremic metabolic acidosis
 - c) Hyperchloremic metabolic alkalosis
 - d) Hypochloremic metabolic alkalosis
37. Which of the following is NOT a cause of wide anion gap acidosis
- a) Uraemia
 - b) Lactic acidosis
 - c) Diabetic ketoacidosis
 - d) Renal tubular acidosis

38. What type of Mapleson circuit is an Ayre's T piece
- Type A
 - Type B
 - Type D
 - Type E
39. Regarding residual neuromuscular blockade in the recovery room which of the following responses is TRUE
- It is uncommon
 - If present it can be easily detected clinically
 - It can occur even after neostigmine reversal in the OT
 - Routine monitoring of neuromuscular blockade in post op is unnecessary
40. Which of the following is FALSE regarding the drug sugammadex
- It is a gamma cyclodextrin
 - It encapsulates molecules of aminosteroidal drugs
 - It has high affinity for rocuronium
 - Affinity for vecuronium is higher than rocuronium
41. Which of the following is responsible for the plateau phase of cardiac action potential
- Slow movement of potassium out of the cell
 - Slow movement of calcium into the cell
 - Slow movement of calcium out of the cell
 - Both A and C
42. A 30 year- old healthy male volunteer is undergoing cardiac function tests as a part of physiology experiment. His vital signs are HR= 70 bpm, BP=124/74 mm Hg, Respiratory rate=12/min, Room air SpO₂ = 100% and Hemoglobin= 14gm/dl. Which of the following is the best determination of the adequacy of his cardiac output
- Cardiac index 4L/min/m²
 - Cardiac output 8.1 L/min by Thermodilution technique
 - Cardiac output 8.1 L/min by Fick method
 - SvO₂ of 75% from a pulmonary artery (PA) catheter

43. The Sinoatrial (SA) and Atrioventricular (AV) nodes are supplied in majority of individuals by
- Left anterior descending artery
 - Right coronary artery
 - Left circumflex artery
 - Posterior descending artery
44. Which of the following ECG leads is most sensitive to detect Anterior wall myocardial Ischemia in the intra-operative period
- V5
 - V4
 - II
 - V2
45. Inhaled Nitric oxide (NO) at 60 ppm has all of the following effects EXCEPT
- Drop in systemic vascular resistance (SVR)
 - Drop in pulmonary vascular resistance (PVR)
 - Improvement in cardiac output
 - Better right coronary perfusion
46. Which of the following drugs need NOT be avoided in the anesthetic management of a patient with Wolf-Parkinson-White (WPW) syndrome
- Ketamine
 - Pancuronium
 - Succinylcholine
 - Digitalis
47. The central venous pressure (CVP) waveform in cardiac tamponade is characterized by
- Abolition of X descent
 - Abolition of Y descent
 - CV waveform
 - Tall C waves
48. Factors influencing the level of spinal anesthesia achieved include all of the following EXCEPT
- Baricity of the anesthetic solution
 - Patient age
 - Volume of the anesthetic solution injected
 - Patient gender

49. Neuraxial block complications using local anesthetics alone include all of the following EXCEPT
- a) Post dural puncture head ache
 - b) Urinary retention
 - c) Postoperative cognitive dysfunction
 - d) High spinal anesthesia
50. Which of the following is NOT a part of the 'STOP BANG' screening questionnaire for obstructive sleep apnea (OSA)
- a) Snoring
 - b) Observed apnea
 - c) Exercise tolerance
 - d) High blood pressure
51. Which of the following is one of the benefits regarding cessation of smoking 12 to 24 hours prior to surgery
- a) Shift of oxyhemoglobin dissociation curve to right
 - b) Improvement in mucociliary transport
 - c) Decrease in sputum production
 - d) Improved small airway function
52. This finding is indicative of microatelectasis on the second postoperative day in patient after major abdominal surgery
- a) Hypercarbia
 - b) Hypoxemia
 - c) Diffuse wheezing
 - d) Tactile fremitus
52. Phenoxybenzamine is a
- a) Selective alpha-1 receptor antagonist and nonselective beta-1 adrenergic antagonist
 - b) Reversible alpha-1 receptor antagonist
 - c) Irreversible, nonselective alpha receptor antagonist
 - d) Selective alpha-2 receptor agonist
53. Patient with type -1 diabetes mellitus is difficult to intubate because of
- a) Increased supra glottic soft tissue due to chronic hyperglycemia
 - b) An association between Type 1 diabetes mellitus and anterior larynx
 - c) Limited joint mobility
 - d) An increased incidence of obesity in patients with type -1 diabetes mellitus

54. Down syndrome is associated with all of the following EXCEPT
- Large tongue
 - Atlanto-occipital instability
 - Hyperthyroidism
 - Increased incidence of seizures
55. Neonates lose heat by all of the following mechanisms in the operating room EXCEPT
- Conduction to cold surfaces
 - Exposure to cold operating room
 - Dry airway gases
 - Metabolism of brown fat
56. The main rationale for using sodium bicarbonate to treat aspirin overdose is
- To neutralize the salicylic acid in blood and thereby keeping a normal plasma pH
 - To facilitate the binding of salicylic acid to plasma proteins
 - To alkalinize the urine thereby favoring the ionized form of salicylic acid in the urine
 - To promote the reduction of salicylic acid by creating a favorable basic chemical environment
57. Injection of local anesthetics into which of the following sites is most likely to result in the highest peak plasma concentration
- Caudal
 - Epidural
 - Intercostal
 - Brachial plexus
58. The false-positive probability in a research design is also the:
- Power of the test
 - False-negative probability
 - P-value
 - Type I error
59. Which mode of high frequency ventilation has an active expiratory component
- High frequency jet ventilation (HFJV)
 - High frequency percussive ventilation (HFPV)
 - High frequency positive pressure ventilation (HFPPV)
 - High frequency oscillatory ventilation (HFOV)

60. A 70-year-old is to undergo right hip arthroplasty. A 20 G Arterial line is inserted into the right radial artery and zeroed with the transducer at the level of the heart. On positioning in left decubitus position, the right arm is placed on a pillow such that the right wrist is 20 cm above the heart, while the transducer is positioned at the level of the sternum. The BP reads 120/80. The actual pressure would be
- 105/65 mmHg
 - 100/60 mmHg
 - 120/80 mmHg
 - 135/95 mmHg
61. For the carbon dioxide absorber to work, the following are necessary
- Water
 - Heat
 - Hydrochloric acid
 - Sodium hydroxide
62. A 55-year-old male with history of severe sleep apnea is scheduled for a thoracotomy. The following analgesic strategies can be used effectively and safely EXCEPT
- Patient-controlled epidural analgesia plus 1 g of acetaminophen (every 8 h) plus 75 mg of pregabalin preoperatively
 - Paravertebral block plus 48 h of 30 mg of intravenous ketorolac (every 8–12 h) plus 1 gm of acetaminophen (every 8 h)
 - Continuous intravenous opioid analgesia of 50 µg of fentanyl/hour
 - Intercostal block plus 48 h of 30 mg of intravenous ketorolac (every 8–12 h) plus 1 gm of acetaminophen (every 8 h) plus patient controlled intravenous fentanyl analgesia (10 µg every 10–15 min, no basal rate)
63. Among the non-depolarizing neuromuscular blocking drugs (NMBDs) listed below, which one has highest incidence of anaphylaxis
- Atracurium
 - Vecuronium
 - Rocuronium
 - Pancuronium

64. A 70-year-old man with calcific aortic stenosis is undergoing proctocolectomy under general anesthesia. His medications include aspirin and atenolol, which he took on the morning of surgery. After induction of anesthesia, his mean arterial pressure falls from 120 to 60 mm Hg. Heart rate is 70/ min and other vitals are unchanged. Which would be the best intervention
- a) Give IV phenylephrine bolus dose as it will restore coronary perfusion pressure
 - b) Give IV epinephrine bolus dose as it will increase HR and restore cardiac output
 - c) Give IV esmolol bolus dose as it will decrease HR and allow more time for diastolic filling restoring cardiac output
 - d) Give IV norepinephrine bolus dose as it will activate the baroreceptor reflex and cause tachycardia restoring blood pressure to normal.
65. Which among the following is NOT a variable of revised cardiac risk index
- a) Pathological Q waves in electrocardiograph
 - b) Intraperitoneal surgery
 - c) History of stroke
 - d) Serum creatinine > 120 micro mol/litre
66. The risk estimate of myocardial infarction and cardiac arrest after non-cardiac surgery in cardiac patients with revised cardiac risk index score of 3 or more
- a) 10%
 - b) 15%
 - c) 25%
 - d) 50%
67. Which of the following is NOT recommended for preoperative optimisation of a coronary artery disease patient undergoing lower limb surgery
- a) Initiate metoprolol before 24 hours and continue throughout the perioperative period
 - b) Continue statin during the perioperative period
 - c) Don't initiate calcium channel blockers
 - d) Cessation of smoking > 4 weeks
68. Which drug is used in the POISE-2 trial to assess its effect on perioperative myocardial infarction or mortality
- a) Metoprolol
 - b) Aspirin
 - c) Losartan
 - d) Enalapril

69. The frangible disc in medical gas cylinder works under which principle
- Gay Lussac's law
 - Boyle's law
 - Henry's law
 - Raoult's law
70. One kPa is equivalent to
- 10.3 cm H₂O
 - 14.7 psi
 - 0.76 mm Hg
 - 100 mbar
71. All of the following are required permanent markings on a medical gas cylinder EXCEPT
- The serial number
 - The service pressures
 - The name of the contained gas
 - The symbol of the producer or manufacturer
72. The Diameter index safety system is used for devices at pressures of
- 60 psi
 - 1380 psi
 - 147 psi
 - 200 psi
73. The absolute indication for single lung ventilation is
- Bronchopleural fistula
 - Mediastinal exposure
 - Esophageal resection
 - Thoracic spine surgeries
74. The tissue oxygen delivery depends on all of the following EXCEPT
- Cardiac output
 - Hemoglobin
 - PaO₂
 - SvO₂

75. Which among the following anaesthesia journal has the highest impact factor
- Anesthesiology
 - Anesthesia Analgesia
 - British journal of Anaesthesia
 - European journal of Anesthesiology
76. The Bezold-Jarisch reflex induces all of the following EXCEPT
- Bradycardia
 - Hypertension
 - Coronary artery dilatation
 - Hypotension
77. Following are contraindications for percutaneous tracheostomy in intensive care unit EXCEPT
- Unprotected airway
 - Deranged coagulation
 - Pulmonary toilet
 - High innominate artery
78. The first article on laryngeal mask airway by Dr. Brain was published in the journal
- Anaesthesia
 - New England journal of medicine
 - British journal of anaesthesia
 - Lancet
79. Thermodilution cardiac output measurement is prone to errors by all EXCEPT
- Rapid fluid blouses
 - Tricuspid regurgitation
 - Ventricular septal shunts
 - Mitral regurgitation
80. Overestimation of pulse oximetry reading occurs in
- Hypotension
 - Anemia
 - Carboxyhemoglobinemia
 - Hemoglobin K

81. Low Scvo₂ and low delivery of oxygen is seen in all of the following conditions EXCEPT
- a) Heart failure
 - b) Hypoxia
 - c) Blood transfusion
 - d) Anemia
82. Conditions associated with down regulation of acetylcholine receptors are all EXCEPT
- a) Myasthenia graves
 - b) Anticholinesterase poisoning
 - c) Organophosphate poisoning
 - d) Multiple sclerosis
83. Typical sign of compensated shock in paediatric patients is
- a) Depressed mental status
 - b) Tachypnea
 - c) Tachycardia
 - d) Decreased urine output
84. The most sensitive indicator of a successful resuscitation to each step in a neonate is an increase in
- a) Oxygen saturation
 - b) End-tidal CO₂
 - c) Heart rate
 - d) Respiratory rate
85. The recommended dose of naloxone for reversal of opioid overdose in neonates is
- a) 0.1 mg/kg
 - b) 0.4 mg/kg
 - c) 1 mg/kg
 - d) 0.01mg/kg
86. The Berlin criteria is used for the diagnosis of
- a) Acute respiratory distress syndrome
 - b) Cardiac tamponade
 - c) Acute renal failure
 - d) Hemorrhagic stroke

87. The BART trial eliminated the routine use of which drug from the clinical practice
- a) Thalidomide
 - b) Apretonin
 - c) Rapacuronium
 - d) Cisapride
88. An ECG shows ST elevation in leads I, aVL and V2-V6. Which of the following blood vessel is most likely affected
- a) Left posterior descending artery
 - b) Left anterior descending artery
 - c) Left circumflex artery
 - d) Left coronary artery
89. The following were the risk factors for venous thromboembolism in a hospitalized patient EXCEPT
- a) Inflammatory bowel disease
 - b) Central venous catheterization
 - c) History of coronary artery disease
 - d) Obesity
90. Which of the following is NOT correct regarding the perioperative management of patients on Warfarin
- a) Bridging not needed for patients at low risk of thromboembolism
 - b) Discontinue warfarin 5 days before elective surgical procedure
 - c) Intravenous Vitamin K for immediate warfarin reversal
 - d) Bridge with low molecular weight or unfractionated heparin
91. "c" wave in central venous pressure waveform corresponds to
- a) Rapid emptying of atrial blood into ventricle
 - b) Atrial contraction
 - c) Bulging of the tricuspid valve into the right atrium as right ventricle begins to contract
 - d) Right atrial filling occurs during right ventricle systole with a closed tricuspid valve

92. Side effects of ACE inhibitors include all EXCEPT
- Cough
 - Proteinuria
 - Hypokalemia
 - Angioedema
93. Appropriate treatment in the immediate management of an anaphylactic reaction during anaesthesia is
- High dose of intravenous frusemide
 - Cessation of all intravenous fluids
 - Intravenous adrenaline
 - Intravenous bicarbonate
94. Expiratory reserve volume is
- Vital capacity – Inspiratory capacity
 - Residual volume + Tidal volume
 - Functional residual capacity – Tidal volume
 - Tidal volume – Residual volume
95. Unit of airway resistance is
- cm H₂O/L/sec
 - L/sec/cm H₂O
 - ml/cm H₂O
 - cm H₂O/ml
96. A rightward shift of oxy-haemoglobin curve occurs in all EXCEPT
- Alkalosis
 - Increased 2,3 DPG
 - Increased temperature
 - Exercise

97. All the following are indications for the use of intra-aortic balloon pump EXCEPT
- a) Refractory ventricular failure
 - b) Cardiogenic shock
 - c) Impending myocardial infarction
 - d) Severe aortic regurgitation
98. The alveolar minute ventilation of a patient with tidal volume 600 ml, dead space 150 ml and respiratory rate 12/min
- a) 7.2 L/min
 - b) 5.4 L/min
 - c) 9.0 L/min
 - d) 3.6 L/min
99. All the following factors can produce ST segment elevations EXCEPT
- a) Early repolarization
 - b) Hypokalemia
 - c) Pericarditis
 - d) Ventricular aneurysm
100. The normal duration of the QRS complex is less than
- a) 0.01 second
 - b) 0.05 second
 - c) 0.10 second
 - d) 0.15 second

