

MIZORAM PUBLIC SERVICE COMMISSION

**TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF
GRADE-II OF MIZORAM HEALTH SERVICE (SPECIALIST SUB-CADRE)
UNDER HEALTH & FAMILY WELFARE DEPARTMENT,
GOVERNMENT OF MIZORAM. OCTOBER, 2022**

**PAPER - II (TECHNICAL)
ANAESTHESIOLOGY DEPARTMENT**

Time Allowed : 3 hours

Full Marks : 200

All questions carry equal marks of 2 each.

Attempt all questions.

1. Which of the following nerves is involved in affecting the heart rate?
(a) Vagus (b) Trigeminal
(c) Facial (d) Abducens
2. Which is one of the three branches of CN V, a block of which would provide anaesthesia to the lower teeth and chin?
(a) Ophthalmic (b) Maxillary
(c) Mandibular (d) Superior Laryngeal
3. Which three nerves are sensory cranial nerves?
(a) Olfactory, Optic and Vestibulocochlear (b) Oculomotor, Trochlear, and Abducens
(c) Glossopharyngeal, Vagus, Accessory (d) Facial, Trigeminal and Hypoglossal
4. A cranial nerve with the highest number of branches is
(a) Facial nerve (b) Trigeminal nerve
(c) Vagus nerve (d) Abducens
5. The sympathetic stimulation reaches larynx through which nerve?
(a) Nerves of superior cervical ganglia (b) Vagus nerve
(c) Glossopharyngeal nerve (d) Laryngeal nerve
6. Length of trachea is
(a) 12-14 cm (b) 11-13 cm
(c) 10-12 cm (d) 11-12 cm
7. The most common main bronchus anomalies are
(a) Tracheal bronchus and the accessory cardiac bronchus
(b) Right middle lobe bronchus
(c) Right main bronchus
(d) Left lower lobe bronchus
8. Broncho pulmonary segments are
(a) 10 on the right and 9 on the left (b) 5 on the right and 7 on the left
(c) 8 on the right and 6 on the left (d) 8 on the right and 10 on the left

9. The total number of alveoli present in the human lungs is estimated to be around
 - (a) 1 billion
 - (b) 800 million
 - (c) 500 million
 - (d) 1500 million
10. The maximum volume of air contained in the lung by a full forced inhalation is called
 - (a) Tidal volume
 - (b) Vital capacity
 - (c) Ventilation rate
 - (d) Total lung capacity
11. The alveolar epithelium of lungs is
 - (a) Ciliated squamous
 - (b) Non-ciliated squamous
 - (c) Non-ciliated columnar
 - (d) Ciliated columnar
12. The linings that separate air contained in lungs from venous blood
 - (a) Squamous epithelium and tunica media
 - (b) Squamous epithelium and endothelium
 - (c) Transitional epithelium and tunica externa
 - (d) Squamous epithelium and tunica externa
13. An inhaled foreign body is likely to lodge in the right lung due to
 - (a) The right main bronchus is wider than the left main bronchus
 - (b) The left main bronchus is more vertical than the right bronchus
 - (c) Tracheal bifurcation always directs the foreign body to the right lung
 - (d) The left main bronchus is cartilaginous
14. The walls of the ventricles possess thick muscular projections, which are known as
 - (a) Conus arteriosus
 - (b) Truncus arteriosus
 - (c) Columnae carneae
 - (d) Chordae tendineae
15. The location of the neuro centre activity of the heart is
 - (a) Midbrain
 - (b) Pons
 - (c) Cerebrum
 - (d) Medulla Oblongata
16. The reason why tricuspid and bicuspid valves are closed is
 - (a) Ventricular relaxation
 - (b) Ventricular filling
 - (c) Attempted backflow of blood into the atria
 - (d) Atrial systole
17. The reason why the SA node is the natural pacemaker is
 - (a) Generates an action potential which is more in size than other parts of the conducting system
 - (b) Generates maximum number of action potentials and initiates and maintains rhythmicity of the heart
 - (c) Because it is located in the right atrium
 - (d) Only part of the conducting system generating impulse
18. The tricuspid valve is present between
 - (a) Right auricle and right ventricle
 - (b) Ventricle and aorta
 - (c) Left auricle and left ventricle
 - (d) Ventricle and pulmonary artery
19. Bundle of His is
 - (a) Elongated muscle fibres connecting the AV Node and left and right chambers of the heart
 - (b) Nerve fibres distributed in ventricles
 - (c) Muscle fibres distributed throughout the heart walls
 - (d) Nerve fibres found throughout the heart
20. The hormonal regulation of cardiac output is
 - (a) mediated by the adrenal cortex
 - (b) mediated by the adrenal medulla
 - (c) mediated by thyroid
 - (d) mediated by pineal gland

21. In posterior triangle of the neck, the anterior rami of C5 to T1 intermingle with one another and form a complex nerve called
- (a) Subclavian nerve (b) Brachial Plexus
(c) Radial nerve (d) Ulnar nerve
22. The brachial plexus lie above and lateral to the first part of
- (a) Lateral cord (b) Axillary sheath
(c) Middle cord (d) Axillary artery
23. Cerebrospinal fluid circulates around the brain between
- (a) Arachnoid and pia matter (b) Dura matter and arachnoid
(c) Skull and dura matter (d) Pia matter and brain surface
24. If there is an injury in the hypothalamus region of the brain, it is most likely to affect
- (a) Co-ordination during locomotion (b) Decision making
(c) Regulation of body temperature (d) Short-term memory
25. Which part of the brain has a blood-brain barrier?
- (a) Anterior pituitary (b) Posterior pituitary
(c) Pineal body (d) Area postrema of the fourth ventricle
26. Which is the first branch of internal carotid artery
- (a) Anterior cerebral artery (b) Ophthalmic artery
(c) Middle cerebral artery (d) Striate artery
27. Theories of general anaesthesia include all except
- (a) Lipid Theory
(b) Surface Tension Theory (Adsorption Theory)
(c) Cell Impermeability Theory
(d) Neuro Physiological Theory
28. Humphry Davy first noted the analgesic property of this inhalational anaesthetic
- (a) Ether (b) Nitrous Oxide
(c) Halothane (d) Desflurane
29. General anaesthetics modulate the activity of transmitter-gated ion channels to
- (a) Enhance inhibitory, or inhibit excitatory neurotransmission
(b) Stimulate excitatory neurotransmission
(c) Suppress inhibitory neurotransmission
(d) Inhibit GABA_A receptors
30. The lung volume at the end of a normal exhalation is called
- (a) Forced vital capacity (b) Functional residual capacity
(c) Forced expiratory volume (d) Residual volume
31. Dead space
- (a) Is defined as the volume of gas which takes part in gas exchange
(b) Are Anatomical dead space and physiologic dead space
(c) Is not affected by positive pressure ventilation
(d) Dead space is usually about 45% of tidal volume

32. The oxyhaemoglobin dissociation curve is shifted to the left by
- (a) An increase in arterial PCO_2
 - (b) Alkalosis
 - (c) A decrease in 2,3 DPG
 - (d) A rise in temperature
33. Rate of Diffusion of gases
- (a) Is Inversely proportional to its vapor density
 - (b) Is directly proportional to its molecular weight
 - (c) Is directly proportional to both time and square root of density
 - (d) Is indirectly proportional to pressure
34. True about gas transport in the blood
- (a) There is about 20 ml of oxygen per 100ml of oxygenated blood
 - (b) Oxygen is mainly transported as carbamino compounds
 - (c) CO_2 is carried best by oxygenated haemoglobin
 - (d) More oxygen is carried dissolved in blood than CO_2
35. Normal V/Q ratio at the middle of the lung is
- (a) 2.5
 - (b) 0.5
 - (c) 1
 - (d) 0.6
36. Which is incorrect about second heart sound
- (a) It is occasionally split
 - (b) It is due to the closure of semilunar valves
 - (c) Indicates the commencement of diastole
 - (d) It has a longer duration than the first sound
37. SA node acts as heart's pacemaker
- (a) Because it has a poor cholinergic innervations
 - (b) Because it has a rich sympathetic innervations
 - (c) Because it generates impulses at the highest rate
 - (d) Because of its capability of generating impulses
38. Rise in the carotid sinus pressure leads to
- (a) Reflex bradycardia
 - (b) Reflex hyperpnea
 - (c) Reflex hypercapnia
 - (d) Reflex tachycardia
39. The ventricular muscles accepts impulses directly from
- (a) Right and left bundle branches
 - (b) Bundle of His
 - (c) Purkinje system
 - (d) AV node
40. Which is incorrect about a normal ECG
- (a) P waves in leads I and II are upright
 - (b) P-R interval is between 0.12-0.20 seconds
 - (c) ST segment corresponds to end of QRS complex to beginning of T wave
 - (d) QT interval is between 4 to 4.44 seconds
41. P wave indicates
- (a) Depolarization of right ventricle
 - (b) Depolarization of left ventricle
 - (c) Depolarization of both atria
 - (d) Atria to ventricular conduction time
42. Ventricular muscle depolarization is indicated by
- (a) PR interval
 - (b) P wave
 - (c) U wave
 - (d) The QRS complex

43. Prothrombin is synthesized by
(a) Stomach (b) Liver
(c) Kidney (d) Spleen
44. Hormone not secreted by kidney
(a) Inhibin (b) Renin
(c) 1,25-dihydroxycholecalciferol (d) Erythropoietin
45. Cell type not present in the kidneys
(a) Langerhans cells (b) Intercalated cells
(c) Mesangial cells (d) Podocytes
46. The combined blood flow through both kidneys normally accounts for _____ of total cardiac output
(a) 20-25% (b) 15-25%
(c) 25-35% (d) 10-20%
47. The following hormone is secreted by anterior pituitary
(a) Vasopressin (b) TSH
(c) Cortisol (d) TRH
48. A tumour that produces large amount of catecholamines can be detected by examining the urine for
(a) Vanillylmandelic acid (VMA) (b) Potassium
(c) Cortisol (d) Uric acid
49. Actions of ACTH include the following except
(a) Increased secretion of aldosterone (b) Feedback inhibition of CRH
(c) Induction of growth of the adrenal gland (d) Stimulation of melanocytes
50. A major regulator of bone growth is
(a) Calcitonin (b) Parathyroid hormone
(c) Growth hormone (d) Prolactin
51. Primary hyperaldosteronism leads to
(a) Increased renin secretion (b) Oedema
(c) Alkalosis (d) Hyperglycaemia
52. The following is a manifestation of Addison's disease
(a) Hyperglycaemia (b) Hypoglycaemia
(c) Obesity (d) Hypertension
53. Excess cortisol secretion in Cushing's syndrome leads to
(a) Protein depletion (b) Increased body hair
(c) Hypotension (d) Hypoglycaemia
54. Insulin secretion is inhibited by
(a) Vagal stimulation (b) Amino acids
(c) Alpha adrenergic stimulation (d) Gastrin
55. Effects of cortisol are all except
(a) Hypertension (b) Hyperglycaemia
(c) Excessive loss of K⁺ in urine (d) Immunosuppression

56. Rate of oxygen consumption by the brain is
(a) 3 to 3.5 ml/100gm/min (b) 10 ml/min/100gm/min
(c) 2 to 3 ml/100gm/hr (d) 5 to 10 ml/100gm/min
57. Cerebral Perfusion Pressure is normally
(a) 50-70 mm of Hg (b) 80-100 mm of Hg
(c) 60-90 mm of Hg (d) 65-110 mm of Hg
58. Total cerebral blood flow in adult averages 750 ml/min which is _____ of cardiac output
(a) 15-20% (b) 10-15%
(c) 15-25% (d) 10-20%
59. Irreversible brain damage is associated with cerebral flow rate below
(a) 50 ml/100g/min (b) 10 ml/100g/min
(c) 10 ml/100g/hr (d) 30 ml/100g/min
60. Major compensatory mechanisms to prevent rise in ICP are all except
(a) Initial displacement of CSF from cranial to spinal compartment
(b) Decrease in CSF absorption
(c) Decrease in CSF production
(d) Decrease in total cerebral blood volume
61. Common sites of brain herniation in case of sustained elevation in ICP are all except
(a) The cingulate gyrus under the falx cerebri
(b) The uncinat through the tentorium cerebelli
(c) The cerebellar tonsils through the foramen magnum
(d) Prefrontal cortex
62. At the neuromuscular junction
(a) The muscle membrane possesses muscarinic receptors
(b) There is a one-to-one transmission of excitatory impulses from the motor neurone to the muscle fibres it innervates
(c) The motor nerve endings secrete noradrenaline
(d) The typical summed end plate potential (EPP) is usually 10 times the potential necessary to trigger an action potential
63. Neurotransmitter released at the neuromuscular junction is
(a) Calcium (b) Sodium
(c) Acetylcholine (d) Acetylcholine esterase
64. All are neurotransmitters except
(a) Acetylcholine (b) Dopamine
(c) GABA (d) Antihistamine
65. Principle inhibitory neurotransmitter in CNS is
(a) Glutamate (b) GABA_A
(c) Serotonin (d) Oxytocin
66. Which of the following drugs can be used to enhance skeletal muscle contractions?
(a) Botulinum toxin (b) Neostigmine
(c) Suxamethonium chloride (d) Pancuronium bromide

67. Following the binding of acetylcholine to nicotinic receptors in the peripheral nervous system
- (a) A G-protein is activated
 - (b) A channel opens that allows Na⁺ and Ca⁺ to cross the membrane
 - (c) A channel opens that allows K⁺ and Na⁺ to cross the membrane
 - (d) The membrane is hyperpolarized
68. Following are all pulmonary function tests except
- (a) Spirometry
 - (b) Lung volume test
 - (c) Gas diffusion test
 - (d) Bronchoscopy
69. Spirometry cannot directly measure
- (a) Tidal volume
 - (b) Inspiratory reserve volume
 - (c) Residual volume
 - (d) Expiratory reserve volume
70. All are contraindications to PFT except
- (a) Pneumothorax
 - (b) Thoracic, abdominal or cerebral aneurysms
 - (c) Haemoptysis of unknown origin
 - (d) Evaluation of the effects of occupational or hazardous exposures
71. All are true for normal values of Pulmonary Function Tests except
- (a) Forced Expiratory Volume-80% to 120%
 - (b) Forced Vital Capacity-80% to 120%
 - (c) Tidal Volume-80% to 120%
 - (d) Residual Volume-5-10 ml/kg
72. Risks of pulmonary function test include all except
- (a) Dizziness during the tests.
 - (b) Feeling short of breath.
 - (c) Generalized body pain
 - (d) Asthma attack brought on by deep inhalation.
73. Shock is most accurately defined as
- (a) Inadequate tissue perfusion to meet the oxygen demand of end organs
 - (b) Hypotension not responsive to intravenous fluid administration
 - (c) An irreversible process of multisystem organ failure
 - (d) Decreased blood flow resulting from inadequate cardiac output
74. The most common form of shock in patients admitted to ICU is
- (a) Neurogenic shock
 - (b) Septic shock
 - (c) Hypovolaemic shock
 - (d) Obstructive shock
75. Common signs and symptoms of shock includes all except
- (a) Low blood pressure
 - (b) Altered mental state
 - (c) Weak or rapid pulse
 - (d) Normal respiration
76. The first priority in treatment of shock is
- (a) To correct hypotension
 - (b) To normalize body temperature
 - (c) To start enteral feeding
 - (d) To find cause of shock

77. All the following statements in shock are true except
- (a) Initial stage - cardiac output is decreased, and tissue perfusion is threatened
 - (b) Compensatory- Almost immediately, the compensatory stage begins as the body's homeostatic mechanisms attempt to maintain cardiac output, blood pressure, and tissue perfusion
 - (c) Progressive- The compensatory mechanisms begin to meet tissue metabolic needs, and the shock cycle is corrected
 - (d) Refractory- Shock becomes unresponsive to therapy and is considered irreversible
78. Septic shock is more proinflammatory than other forms of shock because of
- (a) The actions of bacterial toxins, especially endotoxin
 - (b) Triggering of clotting cascade
 - (c) Release of proteolytic enzymes
 - (d) Activation of white blood cells
79. During massive transfusion therapy (greater than 10 units of red blood cells in a 4 h period), which of the following electrolyte abnormalities will require active intervention?
- (a) Hypocalcaemia.
 - (b) Hyperglycaemia
 - (c) Hypochloraemia.
 - (d) Hypomagnesaemia.
80. Obstructive shock can be caused by
- (a) Tachycardia
 - (b) Tension pneumothorax
 - (c) Myocarditis
 - (d) Bradycardia
81. Specific criteria for clinical diagnosis of shock include
- (a) Hypotension (systolic blood pressure < 90 mm Hg) or a 30-mm Hg fall in baseline blood pressure
 - (b) Heart rate > 100 beats/minute
 - (c) Respiratory rate > 22 breaths/minute
 - (d) Urine output < 3 ml/kg/hour
82. Laboratory findings that support the diagnosis of shock include all except
- (a) Lactate > 3 mmol/L (27 mg/dL)
 - (b) Base deficit < -4 mEq/L
 - (c) PaCO₂ < 32 mm Hg (< 4.26 kPa)
 - (d) Respiratory rate > 30 breaths/minute
83. Treatment of distributive shock include all the following except
- (a) IV crystalloids
 - (b) Inotropic or vasopressor drugs
 - (c) IV Calcium
 - (d) Epinephrine for anaphylaxis
84. All of the following are signs of dehydration, except
- (a) Progressive metabolic acidosis
 - (b) Urinary specific gravity > 1.010
 - (c) Urine osmolality < 300 mOsm/kg
 - (d) Urine sodium < 10 mEq/L
85. All of the following fluids are generally considered to be isotonic, except
- (a) Lactated Ringer
 - (b) Normal saline
 - (c) D5 normal saline
 - (d) D5¹/₄ normal saline
86. Fluid exchange between the intracellular and interstitial spaces is governed by
- (a) Extracellular osmotic pressure
 - (b) Osmotic forces created by differences in non-diffusible solute concentrations
 - (c) Intracellular osmotic pressure
 - (d) Plasma proteins

87. All of the following solutions contain potassium, except
- (a) Lactated Ringer solution
 - (b) PlasmaLyte
 - (c) Hydroxyethyl starch
 - (d) Packed red blood cells
88. Replacing an intravascular volume deficit with crystalloids requires how much volume
- (a) 3-4 times the volume needed
 - (b) 1-2 litres/hour
 - (c) In the ratio 1:1 of the volume loss
 - (d) 1-2 times the volume needed
89. Which of the following statements is true regarding fluid loss?
- (a) Substantial evaporative losses can be associated with large wounds and are directly proportionate to the surface area exposed
 - (b) Internal redistribution of fluids, "third spacing," cannot cause massive fluid shifts
 - (c) Traumatized, inflamed, or infected tissues can only sequester minimal amounts of fluid in the interstitial space
 - (d) Cellular dysfunction as a result of hypoxia usually produces a decrease in intracellular fluid volume
90. After blood is collected, the preservative CPDA-1 is commonly added. This contains all of the following, except
- (a) Citrate
 - (b) Phosphate
 - (c) Dextrose
 - (d) Potassium
91. CPD blood from which the buffy coat has been removed is
- (a) Human albumin
 - (b) Microaggregate-free blood
 - (c) Cryoprecipitate
 - (d) Frozen plasma
92. The storage time for packed red blood cells at temperatures of 1 to 6°C is
- (a) 7 to 10 days
 - (b) 21 to 35 days
 - (c) 60 to 80 days
 - (d) 120 days
93. After 48 hours citrate-phosphate-dextrose blood is depleted of
- (a) Factor XI
 - (b) Functioning platelets
 - (c) Factor V
 - (d) Factor VIII
94. The following systems regulate acid-base balance except
- (a) The chemical buffers
 - (b) The respiratory system
 - (c) The renal system
 - (d) The central nervous system
95. Incorrect statement about anion gap out of the following is
- (a) Anion gap is decreased in ketoacidosis
 - (b) Anion gap is decreased in Hypercalcemia
 - (c) Anion gap is decreased in Lithium toxicity
 - (d) In lactic acidosis anion gap is increased
96. Parenteral nutrition provides the following
- (a) Carbohydrates, proteins, fats, vitamins, minerals and electrolytes.
 - (b) Carbohydrates, proteins, fats, vitamins and gelatins
 - (c) Proteins, fats and vitamins
 - (d) Minerals, electrolytes and haemosomes

97. Which of the following parenteral nutrition orders would be least likely to precipitate hypercarbic respiratory failure in a patient with severe chronic obstructive pulmonary disease?
- (a) Protein = 40 g/L, dextrose = 125 g/L, fat = 0 g/L
 - (b) Protein = 30 g/L, dextrose = 150 g/L, fat = 0 g/L
 - (c) Protein = 50 g/L, dextrose = 60 g/L, fat = 50 g/L
 - (d) Protein = 50 g/L, dextrose = 100 g/L, fat = 25 g/L
98. Specific conditions that may require TPN include all except
- (a) Abdominal surgery
 - (b) Persistent chyle leak
 - (c) Hepato-renal syndrome
 - (d) Small or large intestinal obstruction
99. Toxic effect of oxygen
- (a) Tonic-clonic convulsions and amnesia
 - (b) Diffuse alveolar damage
 - (c) Tracheobronchitis
 - (d) Anaemia
100. FIO₂ provided by a non-rebreather mask is
- (a) 60 % to 91%
 - (b) 30% to 50%
 - (c) 21% to 60%
 - (d) 40% to 60%

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