



श्री चित्रा तिरुनाल आयुर्विज्ञान और प्रौद्योगिकी संस्थान, त्रिवेंद्रम , केरल- 695 011
(एक राष्ट्रीय महत्व का संस्थान, विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार)
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Entrance Examination 2020 - Cardiothoracic & Vascular Anaesthesia (DM _ PDCC)

Sl No	Question	Answer	OptionA	OptionB	OptionC	OptionD
1	A portable E-cylinder of oxygen has 1760 psig. In approximately what time frame will the cylinder be depleted if used at 8 L/min	C	30 minutes	45 minutes	60 minutes	85 minutes
2	Which of the following flowmeter arrangements would be the most likely to lead to a hypoxic gas mixture	D	N2O, Air, O2	N2O, Air, O2	N2O, O2 , Air	O2 , Air, N2O
3	Which of the following would cause an abrupt decrease in the end-tidal CO2 (ETCO2) during general anesthesia	D	Hyperthermia	Sepsis	Shivering	Pulmonary embolism
4	Flow proportioning systems of anesthesia machines were designed to prevent which of the following	B	Inconsistent proportions of volatile anesthetic gases	Hypoxic mixtures of nitrogen and oxygen	Inaccurate proportions of gas flow to the common gas outlet	Direct communication between the high-pressure and low-pressure circuits
5	When preparing to place a thoracic epidural, you palpate the inferior border of the scapula. This landmark corresponds to which level of the vertebral column	C	C7-T1	T4-T6	T7-T8	T10-T11
6	The muscles of the larynx are innervated by the recurrent laryngeal nerve EXCEPT which of the following	C	Thyroarytenoid	Thyroepiglotticus	Cricothyroid	Transverse arytenoids
7	The leaflets of the aortic valve are named which of the following	C	Anterior and posterior	Anterior, posterior, and septal	Right coronary, left coronary, and noncoronary	Right, left, and anterior
8	During bronchoscopy, where does the right upper lobe bronchus usually take off	C	5 cm past the carina	Located farther away from the carina than the lingular bronchus on the left	2.5 cm past the carina	It has little anatomic variation
9	While performing echocardiographic assessment of your patient there was abnormal movement of the inferior wall with increased heart rate, whereas all other portions were noted to move normally. Which of the following arteries most likely has a stenotic lesion	D	Posterior descending artery	Left circumflex artery	Left anterior descending artery	Right coronary artery
10	Which of the following "laws" describes the pressure required within the alveolus to remain inflated	A	Laplace's law	Boyle's law	The ideal gas law	Henry's law
11	Select the correct relationship between the pulmonary artery pressure (Ppa), alveolar pressure (PA), and pulmonary venous pressure (Ppv) in West Zone 3	A	Ppa > Ppv > PA	Ppa = Ppv = PA	Ppa > PA > Ppv	PA > Ppa > Ppv
12	Which of the following statements regarding hypoxic pulmonary vasoconstriction (HPV) is FALSE	A	HPV leads to bronchiolar constriction.	HPV is stimulated by alveolar hypoxia.	HPV decreases blood flow.	HPV causes areas that were previously shunted to effectively become silent units.
13	Central chemoreceptors are primarily sensitive to changes in which one of the following	B	Carbon dioxide	Hydrogen ion concentration	Oxygen	Bicarbonate
14	Distribution of blood throughout the circulatory system is not uniform. Which of the following components of the tree has the largest blood volume	A	Venous system	Arterial system	Pulmonary vasculature	Heart
15	Approximately what percentage of cardiac output goes to the liver	D	5%	10%	15%	25%
16	Which of the following coronary arteries is located in the posterior interventricular groove	C	Left anterior descending coronary artery	Right coronary artery	Posterior descending coronary artery (PDA)	Left circumflex coronary artery
17	When the surgeon requests for the patient be placed in the "reverse Trendelenburg" position, which of the following is the PRIMARY parameter initially affected	B	Systemic afterload	Venous return	Myocardial inotropy	Cerebral perfusion
18	Which of the following conditions is MOST sensitive to loss of the "atrial kick"	D	Mitral regurgitation	Aortic insufficiency	Mitral stenosis	Diastolic dysfunction
19	Which of the following tissues has the highest oxygen extraction ratio in the body	A	Renal medulla	Cardiac myocytes	Neurons	Hepatocytes
20	Which of the following mechanisms primarily accounts for the normalization of arterial pH after prolonged hyperventilation in a patient with head injury	A	Increased renal excretion of bicarbonate ions	Decreased RBF	Decreased renal absorption of hydrogen ions	Increased renal resorption of bicarbonate ions
21	Which of the following examples could be an indication for using the process known as "acute normovolemic hemodilution"	B	Congenital heart disease	Refusal of allogenic blood products	Anticipated blood loss of one-third of the patient's volume	Preoperative anaemia
22	Which of the following causes an increase in the ionized calcium concentration	D	Increased serum albumin	Alkalosis	Transfusion	Acidosis
23	Potential adverse effects of succinylcholine include all of the following EXCEPT which one	B	Myalgia	Aspiration	Increased intraocular pressure	Anaphylaxis

24	Which intravenous anaesthetic agent should be avoided in patients with mitochondrial myopathy	A	Propofol	Etomidate	Ketamine	Dexmedetomidine
25	In patients with myasthenia gravis, which factor best predicts the risk of requiring prolonged intubation and mechanical ventilator support	C	Age of illness onset	Involvement of muscle groups	Dosage of acetylcholinesterase inhibitor at home	Circulating autoantibody level
26	Which of the following agents or drugs is most likely to have a similar mechanism of action to ketamine	B	Sevoflurane	Nitrous oxide	Midazolam	Clonidine
27	Which of the following is a predictor of desaturation during one-lung ventilation (OLV)	C	Left-sided thoracotomy	Lateral position during surgery	Normal preoperative spirometry	Balanced perfusion on ventilation/perfusion (V/Q) imaging
28	Which of the following cardiovascular changes associated with aging is FALSE	D	Reduced ventricular compliance	Decreased blood vessel contractility	Desensitization of carotid and aortic baroreceptors	Preserved sympathetic and vagal resting tone
29	The neuraxial block is not contraindicated for patients on which of the following drugs	C	Warfarin	Low-molecular weight heparin	Aspirin	Clopidogrel
30	Which of the following tests is likely to detect clinically relevant bleeding tendency most efficiently	D	Activated partial thromboplastin time	Prothrombin time	Activated clotting time	Thromboelastogram (TEG)
31	Glycopyrrolate, when given preoperatively, can cause all of the following, EXCEPT	C	Skin flushing	Dry mouth	Bronchospasm	Tachycardia
32	Which of the following occurs during the preoxygenation of a patient	B	Increase in functional residual capacity	Denitrogenation	Increase in CO ₂ clearance from lungs	Increase in closing capacity of lungs
33	Which of the following is true of nitrous oxide	D	Acts on central nervous system GABA receptors	Lowers pulmonary vascular resistance (PVR)	Suppresses EEG pattern in the cerebral cortex	Precipitates Vitamin B12 deficiency anemia
34	The antiemetic effect of propofol is thought to occur due to	D	Depressant effect on the chemoreceptor trigger zone	Inhibition of dopamine activity	Inhibition of glutamate release	All of the above
35	Succinyl choline is contraindicated in a patient with	B	Chronic renal failure	Duchene muscular dystrophy	Myasthenia gravis	Patient with full stomach
36	All of the following medications can be administered through an epidural route EXCEPT	D	Fentanyl	Sufentanyl	Alfentanyl	Remifentanyl
37	A newborn after birth was noted to have the following signs. Heart rate of 96 bpm, respiration irregular and slow, showing some flexion of extremities, grimace on stimulation with a nasal catheter and was acrocyanotic. What is the Apgar score	C	0	2	5	8
38	Digoxin toxicity is most likely exacerbated by	B	Hyperkalemia	Hypokalemia	Hypercalcemia	Hypocalcemia
39	The most common complication of inserting a central venous catheter through internal jugular vein	C	Carotid artery puncture	Thrombosis	Cardiac Arrhythmias	Air embolism
40	A patient with hypertrophic obstructive cardiomyopathy (HOCM) presents with dyspnea and angina on exertion. Which of the following is the best agent to treat these symptoms	B	Hydrochlorothiazide	Metoprolol	Morphine	Nitroglycerine
41	Which of the following is the most effective way to reduce renal failure in a patient undergoing abdominal aortic aneurysm open repair	D	Fluid bolus prior to aortic clamping	Fluid bolus after aortic clamp release	Administration of mannitol	Minimization of cross-clamp time
42	An awake tracheostomy would be facilitated by a regional block of the	D	Trigeminal nerve	Glossopharyngeal nerve	Superior laryngeal nerve	Recurrent laryngeal nerve
43	The highest content of soda lime is	A	Calcium hydroxide	Potassium hydroxide	Sodium hydroxide	Silica
44	When interpreting a CVP waveform, the end of systole best coincides with the	C	a' wave	'c' wave	'v' wave	'x' descent
45	The tip of the pulmonary artery catheter typically enters the main pulmonary artery at approximately	C	15 to 25 cm	25 to 35 cm	35 to 45 cm	45 to 55 cm
46	Normal pulmonary vascular resistance ranges between	A	50 and 150 (dynes)(s)/cm ⁵ .	300 and 600 (dynes)(s)/cm ⁵ .	900 and 1500 (dynes)(s)/cm ⁵ .	1800 and 2100 (dynes)(s)/cm ⁵
47	When evaluating flow velocity at a specific point during echocardiography, you would use	B	Continuous wave Doppler	Pulse wave Doppler	Tissue Doppler	Color Doppler
48	The electromechanically quiet heart at 22 ^o C consumes oxygen at a rate of	C	2ml/100 gm	8ml/100gm	0.3ml/100 gm	0.1ml/100gm
49	In thoracic surgeries requiring lung isolation, select the correct statement;	B	Measurement of tracheal width from a posteroanterior chest radiograph is of no use in	More frequent use of left-sided DLT is based on the anatomy of the tracheobronchial	Uniform ventilation to all lobes is most likely achieved by a right sided DLT because it	Fiberoptic confirmation of correct DLT placement is not required if you have good
50	In which of the following situations is applying continuous positive airway pressure (CPAP) to the nondependent lung most ideal for improving oxygenation	B	Broncho-pleural fistula	Open lobectomy	massive pulmonary haemorrhage	Sleeve resection
51	Which of the following statements about lung resection surgery is FALSE	C	Mortality rate for pneumonectomy is 5% to 7%	Mortality rate for lobectomy is 2% to 3%	Mortality is higher for left-sided pneumonectomy	Most postoperative deaths result from cardiac issues

52	Which of the following is true regarding umbilical cord blood gas analysis	D	The umbilical arterial blood gas reflects the fetal condition	The umbilical venous blood gas reflects the maternal condition	Metabolic acidosis of umbilical artery is more ominous than respiratory acidosis	All of the above
53	Normal blood glucose level in a neonate is	B	20 to 40 mg/dL	40 to 60 mg/dL	60 to 70 mg/dL	50 to 80 mg/dL
54	Which of the following tissues does not rely on glucose metabolism in the setting of starvation?	B	Neural tissue	Cardiac tissue	Renal medullary tissue	Erythrocytes
55	In the normal cardiac cycle	C	The mitral valve closes by contraction of papillary muscles	The left ventricular pressure is maximal just before the aortic valve opens	The Dicrotic notch is due to rebound of the aortic valve	The ejection fraction is about 85%
56	The venous return of the heart is decreased by	A	Neuromuscular blockade of skeletal muscles	Exercise	Femoral arteriovenous fistula	Rapid infusion of blood
57	Cardiac output may be measured by all EXCEPT	D	Thermodilution	Ballistocardiography	Doppler ultrasound	Limb plethysmography
58	In the normal cardiac cycle	A	The period of ventricular systole is equal to the Q-T interval	The duration of the QRS complex depends on the heart rate	The PR interval is more than 0.22 seconds	Ejection occurs throughout systole
59	Standards for basic anesthetic monitoring during general anesthesia include which of the following	B	Continuous display of MAC	Continuous display of electrocardiogram	Continuous display of tidal volume	Continuous display of temperature
60	To mitigate the effects of attenuation during ultrasonography, an anesthesiologist would perform which of the following maneuver	A	Use a low-frequency signal	Use a high-frequency signal	Increase the amplitude	Decrease the amplitude
61	What is the anatomic location of the cords of the brachial plexus?	C	Above the clavicle, at the lateral border of the clavicular head of the sternocleidomastoid	At the clavicle, lateral to the subclavian artery	Below the clavicle, closely related to the axillary artery	Below the clavicle, closely related to the axillary vein
62	Which of these agents have the highest saturated vapour pressure	C	Water	Isoflurane	Sevoflurane	Methoxyflurane
63	All of the following are examples of reflex or higher cortical structures that exert an	D	Cough reflex	Hering-Breuer reflex	Reticular activating system	Bezold-Jarisch reflex
64	Which of the following situations has the least significant effect on cerebral blood flow (CBF)	D	PaCO ₂ of 80 mm HG	Temperature of 34°C	Increased blood viscosity	Acute metabolic acidosis
65	In a normal patient, the PO ₂ drops from 100 to 40 mm Hg. What do you expect the pulse oximeter to read	D	99%	95%	90%	75%
66	Select the correct order of greatest to least anti-inflammatory properties of the following glucocorticoids:	B	Hydrocortisone > prednisone > methylprednisolone > dexamethasone	Dexamethasone > methylprednisolone > prednisone > hydrocortisone	Dexamethasone > hydrocortisone > methylprednisolone > prednisone	Hydrocortisone > dexamethasone > prednisone > methylprednisolone
67	In general, agents with high saturated vapour pressure has	A	Low boiling point	High boiling point	Not related to boiling point	Difficult to comment without knowledge of the atmospheric pressure
68	Which of the following statements is TRUE regarding blood pressure in the arterial vascular tree	B	Pulse pressure is the difference between the systolic blood pressure (SBP) in the ventricle	Mean arterial blood pressure (MAP) = DBP + (0.33 x pulse pressure).	The SBP measured in the femoral artery is lower than that measured in the aorta.	The DBP is higher in the femoral artery than in the aorta.
69	Which of the following statements is FALSE	B	There are 3 mechanisms whereby renal blood flow and glomerulofiltration rate are	The renal system does not exhibit autoregulation.	Sympathetic nervous system input results in constriction of all renal vessels.	The myogenic response is an intrinsic action of vascular smooth muscle in response to increased transmural pressure.
70	A 73-year-old man complains of weakness and then falls to the ground. Cardiopulmonary resuscitation (CPR) including chest compressions is initiated. A monitor reveals that the patient is in ventricular fibrillation (VF). Defibrillation is performed, and the monitor reveals a wide complex rhythm at 90 beats per minute. Which of the following is appropriate	A	Continue CPR for 2 minutes.	Cease CPR immediately.	Administer sodium bicarbonate.	Administer vasopressin.
71	A 64-year-old man with a medical history significant for Mobitz type II second-degree heart block after permanent pacemaker (PPM) placement presents for video-assisted right upper lobe wedge resection for a pulmonary nodule. Which of the following intraoperative issues is unlikely to occur from electromagnetic interference (EMI)	C	Increase in ventricular thresholds	Inhibition of pacemaker by EMI	Pacemaker battery failure	Transient or permanent loss of capture.

72	A patient is noted to have altered mental status and hypotension and complains of chest pain. The heart monitor shows a heart rate of 27 beats per minute. Blood pressure is 60/30 mm Hg. After administration of oxygen and lying the patient flat, atropine 0.5 mg is administered every 5 minutes for a total of 3 mg. No response is noted. Which of the following actions is next indicated	D	Amiodarone 300mg IV (intravenous) over 10minutes	Additional atropine	Vasopressin 40 units	Dopamine infusion at 2-20µg/kg/min
73	A patient presents with acute severe pulmonary edema and cardiogenic shock. Transesophageal echocardiography (TEE) demonstrates a ruptured papillary muscle. Which papillary muscle is most commonly affected?	A	Posteromedial	Septal	Noncoronary	Anterolateral
74	A 55-year-old man is undergoing coronary artery bypass grafting. The TEE shows an enlarged coronary sinus. When saline is injected into an IV line in the left upper extremity, bubbles are noted, entering the left atrium (LA) near the inferior vena cava. Which of the following conditions most likely explains the findings	C	An aberrant right coronary artery	Anomalous pulmonary venous return	Left-sided superior vena cava	Patent foramen ovale
75	Commonly pulse oximeters use how many monochromatic light emitting diodes	B	one	Two	Three	Four
76	Which of the following is the "agent of choice" for treatment of tachyarrhythmias associated with Wolff-Parkinson-White?	D	Metoprolol	Verapamil	Carvedilol	Procainamide
77	Release of which of the following substances is most likely to lead to postoperative hyponatremia?	D	Angiotensin II	Aldosterone	Renin	Vasopressin
78	A "flush test" is performed to assess damping of an arterial line pressure- monitoring system. A system with an appropriate dynamic response will have which of the following responses to rapid flushing?	B	One large oscillation before a return to baseline	One large and 1 small oscillation before a return to baseline	One large and 3 small oscillations before a return to baseline	Several large and several small oscillations before a return to baseline
79	100 gram of Soda lime absorbs how many litre of carbon dioxide	C	30 Litres	21 Litres	26 Litres	28 Litres
80	Immune mediated reaction of blood transfusion includes all except	B	Anaphylactic reaction	Hypothermia	Allergic reaction	Purpura
81	Which of the following is not a blood preservative?	C	CPDA-1	AS-5	ADP	AS-3
82	Under dampening of arterial line trace occurs due to	A	Catheter movement	Vasodilation	Air bubbles	Kink in tubing
83	The jet ventilation technique is associated with the following risk	D	Vocal cord palsy	Burns	Eye trauma	Aspiration
84	True about apneic oxygenation is	B	Provides adequate ventilation	High fire risk	Apnea for long intervals needed	Involves delivering oxygen through endotracheal tube
85	Excessive retraction of chest wall after sternotomies causes injury to	A	Brachial plexus	Phrenic nerve	Vagus nerve	Spinal accessory nerve
86	Postexposure prophylaxis (PEP) has been demonstrated to reduce the risk of contracting	A	Hepatitis C	COVID-19	Measles	Varicella
87	True regarding scavenging system of waste anesthesia gas is	B	An open scavenging interface has a pressure relief valve	Active disposal system has both positive and negative pressure relief valve	A closed scavenging interface has no valves	Passive disposal system has a negative pressure relief valve
88	The most reliable site for monitoring core body temperature is	D	Bladder	Oral	Axilla	Pulmonary artery
89	The oxygen supply failure alarm is triggered when the internal oxygen pressure in the anesthesia machine falls below	B	40 psi	30 psi	55 psi	25 psi
90	The cardiac biomarker level used to assess the risk of death or myocardial infarction after noncardiac surgery in cardiac patients is	D	Myoglobin	Atrial natriuretic peptide	Creatinine kinase	Brain natriuretic peptide
91	CESAR trial demonstrated an overall improvement in survival of respiratory failure patients treated with	D	Lung protective ventilation strategy	Prone ventilation	High frequency oscillatory ventilation	ECMO
92	The coagulation factor which decreases during pregnancy is	D	Factor VII	Factor IX	Factor X	Factor XIII
93	Following factors are important in temperature regulation in the newborn except (spot the false statement)	A	Lowered metabolic rate	Oxidation of brown fat	Non-shivering thermogenesis	Release of norepinephrine
94	The following is correct regarding the perioperative management of Antiplatelet Therapy	A	Resume antiplatelet therapy 24 hours postoperatively in patients at low risk	Discontinue aspirin 5 days before surgery	Elective surgery postponed for one year in patients with Drug-eluting stents	Discontinue Prasugrel 14 days prior to surgery
95	The half-life of factor VII is	D	24 hours	12 hours	18 hours	8 hours
96	The recommended temperature for target temperature management during post-cardiac arrest care is	B	30-32° C	32-36° C	35-37° C	28-32° C
97	Management of Junctional ectopic tachycardia (JET) includes all except	B	Decrease inotropes	Warm the patient to 37° C	Adequate sedation	Amiodarone
98	The first recorded anaesthetic to be delivered in obstetric practice was administered by James Young Simpson. The agent he used was	A	Diethyl ether	Chloroform	Nitrous oxide	Ethyl chloride
99	Which of the following agent was used for twilight sleep" for labour pain in the early days of labor anesthesia?	A	Opioids	Diethyl ether	Chloroform	Nitrous Oxide
100	Which of the following is true regarding the fetal circulation	C	The orientation of the IVC-RA junction favours streaming to right ventricle	The orientation of the SVC-RA junction favours streaming to left atrium	The PVR is many times the SVR	Most of the right ventricular output reaches the left atrium