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ENTRANCE EXAMINATION : ACADEMIC SESSION JANUARY 2018

PROGRAMME:DM&PDCC (NEUROANAESTHESIA)

Time: 90 min

Max.Marks: 100

(Select the most appropriate answer)

1. Wakefulness refers to which of the following states?

- A. State of Awareness
- B. State of being arousable
- C. State of consciousness
- D. State of normal memory.

2. Regarding General anesthesia which of the following is true?

- A. Cortical activation
- B. Increased Feedback connectivity in frontoparietal system
- C. Increased communication across cortex
- D. Increased effective connectivity in cortex

3. The capacity to recall facts without spacio temporal context is known as;

- A. Episodic memory
- B. Explicit memory
- C. Implicit memory
- D. Semantic memory

4. K complexes in Electroencephalogram is seen in

- A. REM (rapid eye movement) sleep
- B. NREM (non rapid eye movement) sleep stage 1
- C. NREM sleep stage 2
- D. NREM sleep stage 3

5. β - blockade helps in treatment of all of the following EXCEPT;

- A. Hypertension
- B. Myocardial infarction
- C. Congestive cardiac failure
- D. Stroke

6. Cholinergic nerves are present in all of the following EXCEPT:

- A. Preganglionic parasympathetic neurons
- B. Preganglionic sympathetic neurons
- C. Postganglionic neurons supplying the sweat glands
- D. Motor neurons innervating the smooth muscle

7. Stimulation of α -2 receptors leads to which of the following response?

- A. Vasoconstriction of veins
- B. Vasoconstriction of arteries
- C. Contraction of Gastrointestinal tract
- D. Increase insulin release

8. At 17 ° C core temperature, which of the following represents the Cerebral metabolic rate of Oxygen (CMRO₂) ?

- A. 1-2 % of normo thermic state
- B. 8-10 % of normo thermic state
- C. 18- 20% of normo thermic state
- D. 25 % of normo thermic state

9. Which of the following drugs can cross the intact blood brain barrier?

- A. Norepinephrine
- B. Phenylephrine
- C. Esmolol
- D. Lidocaine

10. Which of the following statement is NOT TRUE regarding cerebral hemodynamics?

- A. Administration of 1 MAC sevoflurane reduces CBF
- B. Administration of 1 MAC sevoflurane reduces CBV
- C. Administration of Propofol reduces CBF
- D. Administration of Propofol reduces CBV

11. Which of the following volatile anesthetic decreases the secretion of Cerebrospinal fluid (CSF) ?

- A. Halothane
- B. Isoflurane
- C. Enflurane
- D. Desflurane

12. Choose the correct answer; Miniature end plate potentials are:

- A. Produced by a single molecule of acetylcholine
- B. They are not affected by drugs
- C. Their amplitude is one tenth of the amplitude of a stimulated response
- D. They are spontaneous depolarising potentials.

13. In a patient with myasthenia gravis, the weakness can be exacerbated by all, EXCEPT,

- A. Infection
- B. Ciprofloxacin
- C. Hypokalemia
- D. Hyperkalemia

14. Use of which of the following opioid has been consistently associated with development of post operative delirium?

- A. Morphine
- B. Meperidine
- C. Fentanyl
- D. Hydromorphone

15. Intubation of a trauma victim with uncleared spine includes all, EXCEPT

- A. Use of rigid cervical collar
- B. Removal of the front of the cervical collar
- C. Gentle traction of the cervical spine manually
- D. Use of cricoid pressure

16. The most common location of the spinal cord injuries is at which level?

- A. C1-C2
- B. C4-C7
- C. L1-L3
- D. L5-S1

17. Choose the correct statement: Ancillary tests for brain death is done;

- A. To bypass apnea test
- B. To reduce the observation period
- C. In all adult brain dead patients
- D. In all brain dead children

18. The risk factors for developing postoperative cognitive decline include all of the following EXCEPT;

- A. Female sex
- B. Older age
- C. Level of education
- D. Prolonged surgery

19. Administration of long term steroids produces which of the following type of adrenal insufficiency?

- A. Primary adrenal insufficiency
- B. Secondary adrenal insufficiency
- C. Tertiary adrenal insufficiency
- D. Relative adrenal insufficiency

20. In children with upper respiratory tract infection which of the following does not reduce the airway reactivity?

- A. Use of laryngeal mask airway (LMA)
- B. Use of small size endotracheal tubes
- C. Topical local anesthesia spray
- D. Postponing surgery for 6 weeks.

21. Which of the following is not true of smoking cessation?

- A. Sympathetic effects decrease in 30 minutes
- B. PaCO₂ decreases in 6 hours
- C. PaO₂ improves in 12 hours
- D. Carboxy hemoglobin decreases in 12 hours.

22. In which of the following conditions administration of supplemental oxygen does not improve PaO₂?

- A. Pulmonary edema
- B. Pulmonary fibrosis
- C. COPD
- D. Pneumonia

23. Which of the following is false regarding the high temperature seen in malignant hyperthermia?

- A. Increased metabolism causes increased temperature
- B. Severe peripheral vasoconstriction increases temperature
- C. Central thermoregulation is reset to high temperature.
- D. Increased sympathetic activity increases temperature.

24. Regarding bradycardia after neuraxial blockade which of the following is false?

- A. Commonly seen at one hour of neuraxial block
- B. Can occur in ASA I patients.
- C. Premedication by atropine does not prevent its occurrence.
- D. More commonly seen in neuraxial block compared to general anesthesia

25. **Which of the following is not true regarding hypokalemia in a patient with brain tumor?**
- A. Surgery needs to be postponed till normal serum potassium levels is achieved.
 - B. Hyperventilation must be avoided.
 - C. Doses of muscle relaxant to be reduced.
 - D. Hyperglycemia needs to be avoided.
26. **In a obese patient which of the following drugs is administered based on total body weight than on lean body mass?**
- A. Thiopentone
 - B. Succinylcholine
 - C. Vecuronium
 - D. Fentanyl
27. **Which of the following is not true regarding intraoperative bronchospasm in an asthmatic patient?**
- A. Intraoperative neuromuscular blocker will relive bronchospam.
 - B. Light plane of anesthesia is one of the cause than asthma itself.
 - C. Laryngeal mask airway is better than ET tube for preventing bronchospasm
 - D. Fentanyl can precipitate bronchospasm.
28. **Resistance to non depolarizing muscle relaxant is not seen in which of the following condition?**
- A. Upper motor neuron lesion
 - B. Lower motor neuron lesion
 - C. Peripheral nerve lesions
 - D. Muscle diseases
29. **Metabolic acidosis stimulates the respiration by acting on which of the following center?**
- A. Medullary respiratory center
 - B. Pontine center
 - C. Cerebral cortex
 - D. Carotid body
30. **In the recent guidelines (8th Joint national committee) on the management of blood pressure in hypertensive patients, which of the following class of drug is not recommended as first line antihypertensive therapy?**
- A. Calcium channel blockers
 - B. Beta blockers
 - C. ACE inhibitors
 - D. Thiazide diuretics

31. Spetzler-Martin classification is used to assess the severity of which of the following condition?

- A. Brain Arterio-venous malformation (AVM)
- B. Cerebral aneurysm
- C. Vein of Galen malformation
- D. Carotid stenosis.

32. Which of the following anesthetic induction agents is considered ideal to use in elderly patients?

- A. Propofol
- B. Etomidate
- C. Midazolam
- D. Thiopentone

33. When compared to Atracurium, which of the following property is not seen with Cisatracurium?

- A. Has Hoffman degradation
- B. Faster acting than atracurium
- C. More histamine release than atracurium
- D. Longer acting than atracurium

34. Patients at risk of postoperative nausea and vomiting must receive which of the following drugs following an ambulatory surgery for prevention of PONV?

- A. Metaclopramide with dexamethasone
- B. Ondansetron
- C. Ondansetron with dexamethasone
- D. Ondansetron with dexamethasone with scopolamine

35. Which of the following conditions does not increase the risk of awareness under anesthesia?

- A. Inhalational anesthetic agents
- B. ASA Grade 3-4
- C. Use of muscle relaxants
- D. Children

36. Which of the following is not a risk factor for delirium occurrence in ICU?

- A. Use of Benzodiazepine
- B. Use of Dexmedetomidine
- C. Pain
- D. Use of opioids

37. Regarding 'delayed awakening' which of the following statement is false?

- A. Patient not waking up after 60-90 minutes is considered delayed awakening
- B. Hypoglycemia is one of the cause
- C. Excessive use of neuromuscular blocking drugs is the commonest cause
- D. Non convulsive status must be ruled out

38. Which of the following is the most common cause of eye pain after surgery under general anesthesia ?

- A. Anterior Ischemic optic neuropathy
- B. Corneal abrasions
- C. Acute glaucoma
- D. Posterior ischemic optic neuropathy

39. Which of the following agents is the most potent corticosteroid?

- A. Dexamethasone
- B. Hydrocortisone
- C. Methyl Prednisolone
- D. Cortisone

40. Which of the following action is not produced by 20% Mannitol to reduce the intracranial pressure?

- A. Reduces cerebrospinal fluid (CSF) production
- B. Increases the CSF absorption
- C. Reduces the cerebral blood volume
- D. Reduces the brain water content.

41. Regarding anion gap which of the following is not true?

- A. Normal anion gap is 8-12 mEq/L.
- B. Albumin is responsible for anion gap.
- C. Lactate are the commonest cause of wide anion gap
- D. Resuscitation with large volume of saline increases anion gap.

42. The most important inhibitory neurotransmitter in the central nervous system is?

- A. Glycine
- B. Glutamate
- C. Norepinephrine
- D. Gama amino butyric acid (GABA)

43. The drug of choice in immediate control of seizures in status epilepticus is;

- A) Lorazepam
- B) Propofol
- C) Phenytoin
- D) Phenobarbitone

44. The 'pumping effect' in the inhalational anesthetic concentration is seen in which of the following condition?

- A) Variable inspiratory flow
- B) Intermittent and frequent use of oxygen flush valve
- C) High PEEP
- D) High vaporiser dial concentration

45. Epileptic activity is associated with all of the following, except:

- A. NMDA receptor activation
- B. Deactivation of glutamate receptors
- C. Increase in CMRO₂
- D. Systemic lactic acidosis

46. Autonomic dysfunction does not occur with?

- A. Amyotrophic Lateral Sclerosis
- B. Guillain Barre Syndrome.
- C. Diabetes mellitus
- D. Myasthenia Gravis

47. Which of the following is NOT correct with regards to perioperative visual loss?

- A. The most common cause of perioperative Ischemic Optic Neuropathy (ION) is compression of the eye.
- B. Impaired venous drainage of the retina can cause Central Retinal Artery Occlusion (CRAO)
- C. Patients who undergo prolonged operative procedures in the prone position with large blood losses are at frequent risk for development of ION.
- D. Some types of ION respond to steroids

48. Climbing one flight of stairs, dancing, or bicycling points to a METs (metabolic equivalent) of;

- A.10
- B.8
- C.6
- D.5

49. Regarding the term ischemic penumbra, which among the following statements is incorrect?

- A. It is an ischemic zone which develops after global ischemia
- B. It receives collateral flow and is partially ischemic
- C. If the insult is maintained for a prolonged period, the neurons in the penumbra will die
- D. More neurons in the penumbra region survive if collateral blood flow is increased.

50. Pharmacodynamics depends on which of the following factors?

- A. Binding of drug to plasma proteins
- B. Drug concentration
- C. Volume of distribution
- D. Route of administration

51. Regarding cerebral vasculature and Circle of Willis, which is not correct?

- A. Collateral arterial inflow channels are most efficacious during acute ischemia
- B. Circle of Willis lies in the subarachnoid space
- C. In a normal individual, there is probably no net flow through the collateral circulation
- D. In many patients the circle of Willis is incomplete.

52. Regarding propofol, which among the following is false?

- A. Propofol has context-sensitive decrement time of approximately 10 minutes when infused for less than 3 hours
- B. It enhances GABA induced chloride currents
- C. There is a unique antiemetic effect, which starts to appear at concentrations that is required to produce general anesthesia
- D. For conscious sedation, rates of 25 to 75 $\mu\text{g}/\text{kg}/\text{min}$ are usually adequate.

53. Hyperemic type of brain swelling is due to which of the following?

- A. Shift of fluid from extracellular to intracellular space
- B. Shift of fluid from intravascular to extracellular space
- C. Shift of cerebrospinal fluid into extracellular space
- D. Increase in intravascular volume

54. Which among the following drugs will you advise the patients to discontinue before surgery?

- A. Thiazide diuretics taken for hypertension
- B. Nonsteroidal antiinflammatory drugs
- C. Monoamine oxidase inhibitors
- D. Birth control pills

55. In the normal individuals, CBF remains constant with CPP in the range of approximately;

- A. 60-180 mmHg
- B. 50 to 150 mmHg
- C. 80-140 mmHg
- D. 50-130 mmHg

56. At an infusion rate of 1-2 µg/min, epinephrine predominantly acts on which receptor/s?

- A. α_1
- B. β_1
- C. β_2
- D. $\beta_1 + \beta_2$

57. The pre central gyrus of the frontal lobe is having which of the following functional area?

- A. The primary motor cortex
- B. Primary somatosensory cortex
- C. Somato sensory association areas
- D. Primary auditory cortex

58. Which of the following modification of patient position has been referred to as the "Concorde" position

- A. Supine
- B. Semi-lateral
- C. Prone
- D. Sitting

59. Regarding cerebral blood flow and circulation, which among the following is incorrect?

- A. CO₂ -induced cerebral vasoconstriction wanes over a period of 6 to 10 hours
- B. Cerebral hematocrit in humans is approximately 75% of systemic values
- C. Within physiologic ranges, PaO₂ does not affect CBF
- D. For each 1°C decrease in body temperature, CMRO₂ drops by approximately 14%.

60. A BMI of 26 is considered to be which of the following?

- A. Obesity Class 1
- B. Normal weight
- C. Obesity Class 2
- D. Over weight

61. The phenomenon by which vasoconstriction in the normal brain may result in redistribution of blood to ischemic regions is known as

- A. Ischemic steal
- B. Cerebral Steal
- C. Robin Hood effect
- D. Circulatory breakthrough

62. Regarding dexmedetomidine, which of the following statements is not correct?

- A. During general anesthesia, dexmedetomidine reduces the MAC of inhaled anesthetics.
- B. As it doesn't reduce the epileptiform activity of seizure foci, it can be used as an anesthetic adjunct during surgical treatment of seizure
- C. Dexmedetomidine has high bioavailability when administered nasally or buccally
- D. It may produce an increase in oral secretions by stimulating salivation.

63. Regarding spinal cord blood flow, which is correct?

- A. The spinal cord is perfused by a pair of anterior spinal arteries (ASA), and a posterior spinal artery (PSA)
- B. Occlusion of the ASA above the artery of Adamkiewicz usually leads to paraplegia
- C. The artery of Adamkiewicz is the major supply to the distal cord.
- D. The ASAs may originate from the posterior radicular artery at C-2.

64. Which among the following statement regarding beta blockers is correct?

- A. Esmolol is ineffective in converting atrial fibrillation to sinus rhythm
- B. Labetalol cannot blunt the cardiovascular responses to tracheal intubation
- C. Labetalol may be given intravenously every 5 minutes in 50 to 100 mg dose
- D. The effect of an esmolol infusion may persist for 20 to 30 minutes after discontinuation of the infusion.

65. Compared with plasma, CSF contains higher concentrations of which of the following molecule?

- A. Glucose
- B. Chloride
- C. Calcium
- D. Bicarbonate

66. Breathing Oxygen leads to hypercapnea due to all EXCEPT;

- A. Absorption atelectasis
- B. Decreased ability to form carbamino compounds
- C. Reducing the H⁺ buffering capacity of histidine
- D. Impairing hypoxic pulmonary vasoconstriction

67. Regarding succinylcholine which statement is not correct?

- A. Succinylcholine-induced increases in serum K⁺ in a patient with subarachnoid hemorrhage seems independent of the presence of motor dysfunction
- B. Succinylcholine elevates ICP only in the presence of space-occupying intracranial lesions.
- C. The rise in ICP is accompanied by EEG arousal
- D. Fasciculation in the muscles of the neck, causing stasis in the jugular veins, might also be a factor contributing to increased ICP with succinylcholine.

68. Isoelectric EEG is seen when the cerebral blood flow is less than

- A. 10ml/100g/min
- B. 15ml/100g/min
- C. 20ml/100g/min
- D. 25ml/100g/min

69. Regarding use of anesthetic drugs in patients with movement disorders, which of the following is INCORRECT?

- A. Benzodiazepines are an appropriate choice for sedation during placement of deep brain stimulation electrode in treatment for Parkinsonism.
- B. Propofol has been reported to cause dyskinesias in patients with movement disorders
- C. Dexmedetomidine in low doses has been used quite widely without reports of interference with intra operative neurophysiological testing signals.
- D. Remifentanyl, may suppress Parkinsonian tremor

70. The Pin Index Safety System (PISS) is designed to;

- A. Prevent the misconnection of hospital gas supply lines to the anesthesia workstation.
- B. Prevent incorrect gas cylinder connections in the anesthesia workstation.
- C. Minimize delivery of a hypoxic mixture
- D. None of the above

71. Which among the following statements is correct?

- A. Normal CMRO₂ is 12-15 ml/100g/min
- B. Brain receives approximately 10 % of cardiac output.
- C. Normal global cerebral blood flow (CBF) is 75-80 mL/100 g/min
- D. The normal range of jugular venous oxygen saturation is 55-75%

72. Impending herniation in ICP monitoring is characterized by which of the following ICP waves?

- A. Lundberg A Waves
- B. Lundberg B Waves
- C. Lundberg C Waves
- D. Lundberg D Waves

73. Regarding induced hypertension which statement is not correct?

- A. It may reduce cell death in a threatened vascular territory
- B. It may shift a region from the penumbra to the penlucida
- C. It may reduce vasogenic edema
- D. Pharmacologically induced hypertension with any attendant tachycardia would raise the risk of cardiac ischemia.

74. Which among the anesthetic agents does not affect the CSF production?

- A. Halothane
- B. Isoflurane
- C. Enflurane
- D. Desflurane

75. Which is NOT a mechanism of action of volatile anaesthetics

- A. Potentiating glutamate release
- B. Potentiating channels activated by glycine
- C. Enhancing GABA release
- D. Potentiating channels activated by GABA

76. The pre capillary anastomotic circle found in the cerebral vascular bed are called;

- A. Circle of Willis
- B. Circle of Duret
- C. Circle of Kahn
- D. Circle of Cushing

77. The concentration of glucose in CSF is approximately 60% of that in blood. This ratio remains constant unless blood glucose rises to more than —mg/dL ?

- A. 160
- B. 270
- C. 450
- D. 520

78. Which of the following probe Frequency is recommended in adults for transcranial Doppler examination?

- A. 2MHz
- B. 5 MHz
- C. 7 MHz
- D. 11 MHz

79. "Canyon T waves" on ECG are found in which of the following condition?

- A. Large hemispheric infarcts
- B. Intra-cerebral haemorrhage
- C. Sub-arachnoid haemorrhage
- D. Acute spinal cord injury

80. Regarding Etomidate, which of the following is a true statement?

- A. At usual induction doses, Etomidate doesn't have significant influences on cerebral blood flow and CMRO₂
- B. It's context-sensitive half-time is shorter than that of propofol
- C. The etomidate concentrations associated with adrenocortical suppression are much higher than the concentrations needed for hypnosis
- D. The induction dose is not affected by a premedication with a benzodiazepine

81. What is the osmolarity of Injection Mannitol 20%?

- A. 300 mOsm/L
- B. 514 mOsm/L
- C. 1024 mOsm/L
- D. 1098 mOsm/L

82. The effect of thiopentone on the cardiovascular system include all of the following except:

- A. The primary cardiovascular effect of a barbiturate during induction of anesthesia is peripheral vasodilation
- B. It transiently decreases sympathetic outflow from the CNS.
- C. Thiopentone has not much effect on Q-T interval and so is a safe agent in patients with a susceptibility to ventricular dysrhythmias
- D. Hemodynamic changes depend on infusion rate of thiopental.

83. The rate of CSF formation in humans is about;

- A. 0.35 to 0.40 mL/hour
- B. 150-200 mL/day
- C. 1.2-2.6 mL/hour
- D. 500 to 600 mL/day

84. As per the Johns Hopkins Surgery Risk Classification System, 'moderately to significantly invasive procedures, with expected blood loss of 500 to 1500 mL and moderate risk to patient independent of anesthesia', belongs to which category?

- A.2
- B.3
- C.4
- D.5

85. Regarding the use of nitrous oxide in neuroanesthesia, which is correct?

- A. The increase in ICP caused by nitrous oxide can be attenuated by prior administration of morphine
- B. Parasympathetic hyperactivity associated with the nitrous oxide may contribute to the changes it produces in CBF and ICP
- C. In neurosurgical patients, its use doesn't seem to affect the incidence of nausea and vomiting
- D. Maximum increase in CBF and ICP occurs when it is administered along with other potent anesthetic agents than when administered alone.

86. Normal brain tissue oxygen tension (PbtO₂):

- A. 10 – 25mm of Hg
- B. 20 – 45mm of Hg
- C. 50 - 75 mm of Hg
- D. 80 - 95 mm of Hg

87. Obstructive hypopnea is characterised by which of the following?

- A. Complete obstruction of airways
- B. Obstruction lasting for more than 10 seconds
- C. Arterial desaturation by 4 %
- D. More than 30 episodes per hour

88. 60-year-old gentleman presents to the emergency room with history of head injury. On evaluation, he does not open eyes to noxious stimuli, makes incomprehensible sounds and has an abnormal flexion to noxious stimuli. Has a GCS of:

- A. E2V2M2
- B. E1V2M3
- C. E1V3M2
- D. E1V3M3

1 4
2 C
3

89. Vasospasm following a sub-arachnoid haemorrhage peaks between:

- A. 1-3 days
- B. 5-7 days
- C. 8-13 days
- D. 14-21 days

90. The target blood sugar level advocated in the perioperative neurosurgical population is:

- A. 70 – 110mg/dl
- B. 110 – 10mg/dl
- C. 140 – 180mg/dl
- D. 180 – 200mg/dl

91. Delayed emergence, emotional liability and disinhibition is seen in patients undergoing intracranial surgery of which of the following areas;

- A. Posterior fossa
- B. Temporal lobe
- C. Frontal lobe
- D. Pituitary

92. Carbon monoxide as a degradation product can be formed, when desiccated absorbents are used during anesthesia provided with which of the following agent?

- A. Isoflurane
- B. Sevoflurane
- C. Enflurane
- D. Desflurane

93. The platelet count required for safe performance of surgery is;

- A. 1.5 lakh/mm³
- B. 1.0 lakh/mm³
- C. 0.5 lakh/mm³
- D. 0.1 lakh/mm³

94. Metabolic alkalosis is seen in which of the following conditions?

- A. Hypoalbuminemia
- B. Free water excess
- C. Hyper phosphatemia
- D. Hyperchloremia

95. Physiologic effect of magnesium include all, EXCEPT,

- A. Sympatholysis
- B. Anticonvulsant
- C. Decrease urine output
- D. Reduction in pain transmission

96. Intraoperative ventilation of an obese patient is best managed by the following manoeuvres, EXCEPT

- A. Complete paralysis
- B. Moderate PEEP
- C. Tidal volume according to total body weight
- D. Recruitment manoeuvres

97. Risks of aggressive fluid replacement in early resuscitation of trauma victims include all EXCEPT

- A. Increased blood pressure
- B. Greater transfusion requirement
- C. Direct immune suppression
- D. Delayed reperfusion

98. Which of the following group of patients cannot be considered for ambulatory surgery?

- A. Obese patients
- B. Old age
- C. Premature babies
- D. Patients with Epilepsy

99. In neonates the fetal circulation can be reverted to by any of the following EXCEPT

- A. Hypoxia
- B. Hypercapnia
- C. Hypothermia
- D. Hypoglycemia

100. Risk factors for postoperative apnea in neonates is all of the following EXCEPT

- A. Prematurity
- B. Regional anesthesia
- C. Desflurane
- D. Anemia