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Ph.D. ENTRANCE EXAMINATION - 2020

Subject : Physiology
Date : 06.01.2020
Max Marks: 60

Duration: 01:30 Hrs.
Place: Dehradun

Student Name:

Invigilator Name:

Signature:

Signature:

- 1. The first heart sound is produced by the:**
 - a. Closure of the aortic and pulmonary valves
 - b. Opening of the aortic and pulmonary valves
 - c. Closure of the mitral and tricuspid valves
 - d. Opening of the mitral and tricuspid valves

- 2. Parasympathetic stimulation of heart causes:**
 - a. SA node decreases firing
 - b. Increased AV node excitability
 - c. Decreased ventricular contraction
 - d. Tachycardia

- 3. Normally, the rate of the heart beat in a human is determined by :**
 - a. The bundle of His
 - b. All cardiac muscle
 - c. The sinoatrial node
 - d. The cervical ganglion

- 4. The ventricular repolarization in ECG is best seen in:**
 - a. "P" wave
 - b. "Q" wave
 - c. "R" wave
 - d. "T" wave

- 5. Cardiac output is not affected by :**
 - a. Heart rate
 - b. Peripheral resistance
 - c. Systolic blood pressure
 - d. Venous return

- 6. All the heart valves are open during which stage of cardiac cycle :**
 - a. Systolic ejection
 - b. Isovolumetric relaxation
 - c. Isovolumetric contraction
 - d. None of the above

- 7. Increased functional demand on the heart produces increased size of the myocardium by :**
 - a. Hyperplasia
 - b. Hypertrophy
 - c. Fatty infiltration
 - d. Increased amounts of fibrous connective tissue

- 8. Hunger centre of brain is:**
 - a. Hypothalamus
 - b. Stria nigra
 - c. Frontal lobe
 - d. Temporal lobe

- 9. Pain sensation from the lateral extremities is transmitted by :**
 - a. Spino thalamic tract
 - b. Dorsal column
 - c. Corticospinal tract
 - d. Spinocerebellar tract

- 10. Cell bodies of the neurons which carry taste sensation from the anterior 2/3rd of the tongue are located in:**
- Trigeminal nerve ganglion
 - Geniculate ganglion
 - Otic ganglion
 - Superior cervical ganglion
- 11. Respiratory centre is situated in:**
- Medulla oblongata
 - Spinal cord
 - Midbrain
 - Hypothalamus
- 12. Sensations of pain from teeth and temperature are carried by**
- Corticospinal tract
 - Corticobulbar tract
 - Lateral spinothalamic tract
 - Ventral spinothalamic tract
- 13. Group B fibers are present in:**
- Intrafusal fibers of the muscle spindle
 - Golgi tendon apparatus
 - Autonomic preganglionic fibers
 - Spinothalamic tracts
- 14. Lesions within the basal ganglia produce the following signs except:**
- Hypotonia
 - Tremor
 - Hemiballismus
 - Athetosis
- 15. In Conn's disease, there is an excess of:**
- Adrenaline
 - Aldosterone
 - Cortisol
 - Noradrenaline
- 16. Which of the following hormones is released from the posterior pituitary?**
- ACTH
 - Antidiuretic hormone
 - Growth hormone
 - Luteinizing hormone
- 17. Which of the following is associated with a low concentration of ionized calcium in the serum?**
- Hypothyroidism
 - Osteogenesis imperfecta
 - Paget's disease of the bone
 - Tetany
- 18. Which hormone is released when serum calcium decreases**
- Parathormone
 - Calcitonin
 - Thyroxine
 - Adrenaline

19. Due fear which of the following hormones increases rapidly :

- a. Growth hormones
- b. Epinephrine
- c. Corticosteroid
- d. Thyroid hormone

20. A child with stunted growth with a stuffed – belly, and short stature with mental retardation is suffering from the deficiency of which of the following:

- a. Thyroxine
- b. Growth hormone
- c. Rickets
- d. Parathyroid

21. Trousseau’s sign and chovstek’s sings are positive in:

- a. Hyperparathyroidism
- b. Hypothyroidism
- c. Hypoparathyroidism
- d. Hyperthyroidism

22. In jaundice, there is an unconjugated hyperbilirubinemia which is most likely due to

- a. Hepatitis
- b. Cirrhosis
- c. Obstruction of bile canaliculi
- d. Increased break down of red cells

23. Histamine stiumlate the secretion of:

- a. Gastrin by stomach
- b. Pancreatic enzymes
- c. HCL by stomach
- d. Amylase by salivary gland

24. The most important function of hydrochloric acid in the stomach is:

- a. Destruction of bacteria
- b. Neutralization of chyme
- c. Activation of pepsinogen
- d. Stimulation of pancreatic secretion

25. Pancreas produce:

- a. Pepsinogen
- b. Chymotrypsinogen
- c. Hydrochloric acid
- d. All of the above

26. Intrinsic factor, which helps in absorption of Vit. B₁₂ is produced by :

- a. Parietal cells of stomach
- b. Chief cells of stomach
- c. Beta cells of pancreas
- d. Goblet cells

27. Maximum secretory glands in stomach are:

- a. Fundic glands
- b. Pyloric glands
- c. Gastric glands
- d. Brunner's glands

- 28. Which of the following coagulation factors is deficient in classical hemophilia?**
- VIII
 - IX
 - X
 - XII
- 29. Which of the following is one for a patient on coumarin (warfarin) therapy:**
- Partial thromboplastin time (PTT)
 - Prothrombin time (PT)
 - Bleeding time (BT)
 - Capiillary fragility test (CFT)
- 30. The anticoagulant of choice used in the blood bank is:**
- Calcium oxalate
 - Heparin solution
 - Acid citrate dextrose solution
 - Sodium fluoride
- 31. To preserve blood for transfusion later:**
- Dilute with equal volume of 0.9% saline
 - Add solution of sodium citrate
 - Add solution of calcium chloride
 - Add fibrinogen
- 32. T- lymphocytes function to :**
- Antibody production
 - Complement activation
 - Lymphokine production and delayed hypersensitivity
 - Immediate hypersensitivity
- 33. Haemoglobin is the major buffer in blood, bicarbonate ions diffuses out of erythrocyte into plasma in exchange of:**
- Potassium
 - Phosphate
 - Carbonic acid
 - Chloride ion
- 34. The eosinophil count in the peripheral blood smear is increased in:**
- Allergic conditions
 - Anaemia
 - Polycythemia
 - Typhoid fever
- 35. During exercise:**
- Cerebral blood flow increases if there is increase in systolic blood pressure
 - Body temperature increases
 - Blood flow to muscle increases after 1½ minute
 - Lymphatic flow from muscle decrease
- 36. The percentage of body water is greater in**
- Male than in females
 - Children than in adult
 - Obese than in lean individuals
 - old than in young objects

37. Meiotic division of male germ cells commence

- a. During intra - uterine life
- b. just before birth
- c. by around 6 years after birth
- d. **by around 16 years**

38. Primary cause of bleeding disorder in liver damage is due to

- a. **Decreased level of prothrombin**
- b. Lack of vitamin K
- c. Platelet deficiency
- d. Lack of vitamin B

39. T- lymphocytes play a primary role in

- a. Production of Antibodies
- b. **production of lymphokines and delayed hypersensitivity**
- c. Activation of complement system
- d. Immediate Hypersensitivity

40. Gut associated lymphoid tissue (GALT) is primarily located in-

- a. **Lamina propria**
- b. Submucosa
- c. Muscularis
- d. Serosa

41. Which of the following events DO NOT occur in rods in response to light-

- a. Structural changes in rhodopsin
- b. Activation of transducin
- c. Decreased intracellular cGMP
- d. **Opening of Na⁺ channels**

42. Calcium ions triggers muscle contraction by binding to :

- a. Actin
- b. Myosin
- c. **Troponin**
- d. Tropomyosin

43. The contractile element in a skeletal muscle is present in:

- a. Sarcolemma
- b. Sarcoplasm
- c. **Myofibril**
- d. Endomysium

44. Contractile element in myofibril is:

- a. H band
- b. Sarcoplasm
- c. **Sarcomere**
- d. A line

45. Skeletal muscles:

- a. Contracts when calcium is taken up by sarcoplasmic reticulum
- b. Contracts when actin and myosin filaments shorten
- c. **Contraction is initiated by calcium binding to troponin**
- d. Contraction is initiated by calcium binding to tropomyosin

46. The following electrodes are used to detect the muscle activity without pain:

- a. Surface electrode
- b. Round electrode
- c. Hook electrode
- d. Needle electrode

47. Rigor mortis results after death is due to

- a. Failure of acetylcholine to diffuse
- b. Failure of ATP supply
- c. Failure of break down of calcium bridges
- d. None of the above

48. A decrease in the urine output is called :

- a. Dysuria
- b. Nocturia
- c. Oliguria
- d. Polyuria

49. In osmotic diuresis there is:

- a. Increase in renal blood flow
- b. Increase in glomerular filtration rate
- c. Increase in NaCl concentration in urine
- d. Decrease in reabsorption of Na Cl

50. Test for estimating kidney function is:

- a. Serum creatinine
- b. Serum phosphatase
- c. Inulin test
- d. Insulin test

51. Carbonic anhydrase in the kidney tubular cells is known to be associated with:

- a. Urea
- b. Chloride
- c. Bicarbonate ion
- d. Carbohydrate

52. Renin is released from the kidney in all except:

- a. Sympathetic stimulation
- b. Decrease in the concentration of sodium ions in the proximal tubules
- c. Decrease in the concentration of sodium ions in the distal tubules
- d. Fall in the BP

53. The kidney secrete all of the following hormones except:

- a. Renin
- b. Erythropoietin
- c. Vasopressin
- d. 1,2,5 Dihydroxy cholecalciferol

54. The glomerular filtration rate of the human kidney may be determined by measuring the plasma clearance of:

- a. PAH
- b. Urea
- c. Inulin
- d. Glucose

55. Brush border is seen in:

- a. Bowman's capsule
- b. Proximal convoluted tubule
- c. Distal convoluted tubule
- d. Loop of Henle

56. During inspiration when the diaphragm contracts, the intrapleural pressure becomes:

- a. More negative
- b. Less negative
- c. Positive
- d. Equal to the intra alveolar pressure

57. A decrease in the arterial PO₂ is seen in:

- a. Decrease in hemoglobin concentration of arterial blood
- b. Paralysis of inspiratory muscles
- c. Sluggish blood flow
- d. High altitudes

58. The major sign of hypoventilation is:

- a. Cyanosis
- b. Dyspnoea
- c. Hypercapnia
- d. Hypoxia

59. Most effective method of assessing breathing is by measuring:

- a. Tidal volume
- b. Respiratory rate
- c. Alveolar ventilation
- d. FEV 1

60. The volume of gas in the lungs at the end of normal expiration is

- a. Expiratory reserve volume
- b. Functional residual capacity
- c. Residual volume
- d. Inspiratory reserve volume
