To be filled by the candidate) **Booklet S. No. _____**

Roll No. (In figures) _____

Roll No. (In words) _____

_____

Name of the Candidate : _____

Father's Name : _____

Center of Examination : _____

Total No. of Questions : 50

Paper Code-2617

Name of Examination- Senior Resident/Specialist Tutor Entrance 2026

Specialty-Physiology

Time Allowed : 90 Minutes **Maximum Marks : 200**

IMPORTANT NOTE:

(i) OMR Answer Sheet will be supplied by the Examination Centre Superintendent for answering the questions.

(ii) Use **Blue/Black Ink/ Ball Pen only**, to darken the appropriate circle in the OMR Answer Sheet.

(iii) Darken one circle deeply for each question in the OMR Answer Sheet, as faintly darkened circle might be rejected by the Optical Scanner.

(iv) Darkening of more than one circle shall be rejected by the scanner. **Over-writing, cutting, erasing or use of White Fluid is not allowed.**

(v) Before dealing with the question paper, fill-up the required information with Blue/Black Ball Pen correctly both in the Question Booklet and in the OMR Answer Sheet.

(vi) Do not fold the OMR Answer Sheet nor put any mark here and there to avoid rejection by the Optical Scanner.

(vii) Write Roll. No. carefully on the OMR Answer Sheet and darken the appropriate circle properly.

(viii) **Each question carries Four Marks while 1 mark shall be deducted for each incorrect response.**

(ix) **Use of Calculator is not allowed.**

(x) **No over-writing, cutting, erasing or use of white fluid is allowed.**

(xi) Rough work be done on the sheet(s) at the end.

(xii) **MOBILE TELEPHONES (EVEN ON SWITCH-OFF MODE) AND SUCH OTHER ELECTRONIC DEVICES ARE NOT ALLOWED INSIDE THE EXAMINATION HALL.**

(xiii) The question paper-booklet will be retained by the candidate after the entrance test is over.

1. The initial part of the pacemaker potential is due to

a. Closure of the delayed rectifier K^+ channel
b. Opening of the f(funny) channels
c. Opening of transient (T) Ca^{++} channels
d. Opening of the L (long lasting) Ca^{++} channels

Ans: b

2. The mechanical events corresponding to PR interval in ECG is

a. Ventricular depolarization and atrial repolarization
b. Ventricular depolarization and ventricular repolarization
c. Atrial depolarization and conduction through AV node
d. Ventricular repolarization only

Ans: c

3. Sinus arrhythmia corresponds to

a. An exaggerated response of SA node to sympathetic system stimulation during exercise
b. A decrease in heart rate during inspiration and increase during expiration
c. A fluctuation in parasympathetic output to the heart during two phases of respiration.
d. A disease process affecting the sinus node leading to arrhythmia, syncope and dizziness.

Ans: c

4. The bundle of Kent connecting atrial and ventricular muscle is

a. A conducting pathway slower than the AV node causing excitation of one ventricle earlier than other
b. An additional aberrant muscular or nodal tissue connection seen in WPW syndrome
c. The abnormal pathway developed due to mutation in gene coding GMP activated protein kinase
d. Responsible for conducting abnormal rhythm from SA node to ventricle in sick sinus syndrome

Ans: b

5. The c wave in jugular venous pulse is produced due to

a. Bulging of atrio-ventricular valve at the beginning of ventricular contraction
b. Slow flow of blood from veins into atria nearing end of ventricular contraction
c. Atrial contraction causing increased pressure in the atria during ventricular diastole
d. Bulging of ventricular wall in the atria during mid ventricular contraction

Ans: a

6. The most common cause of current of injury in heart is

a. Myocardial ischemia
b. Mechanical injury to heart
c. Myocarditis
d. Left ventricular hypertrophy

Ans: a

7. As blood flows through the systemic circulation, its mean pressure falls progressively from

a. 100 mmHg at arterial side to 35 mmHg near the venous end
b. 100mmHg at arterial side to 17mmHg at the capillary end
c. 100 mmHg at arterial end to 0 mmHg at the termination of vena cava to right atrium
d. 100mmHg at arterial side to nearly 10mmHg near the venous end

Ans: c

8. The tendency of turbulent flow increases in direct proportion to

a. the velocity of blood flow and diameter of the blood vessels
b. the density of blood and inversely proportional to the diameter of blood vessel
c. the viscosity of blood and velocity of blood flow
d. the diameter of blood vessel and viscosity of blood

Ans: a

9. Endothelin, one of the most potent vasoconstrictors produced by endothelium

a. Acts through tyrosine kinase receptor
b. Resembles polypeptide sarafotoxin found in snake venom
c. Is found to be increased in hypertensive patients
d. Plays an important role in closure of arterio-venous fistula at birth

Ans: b

10. Multidrug nonspecific transporters present in the apical membrane of endothelium in the brain are member of

a. α- globulin transcortin that transports steroid hormones in blood
b. A family of co-transporters, Sodium Dependent Glucose Transporters(SGLT) found in GIT
c. Adrenergic receptors coupled to phospholipase C via G-proteins
d. A family of ATP binding cassettes that transport various proteins and lipids across cell membranes

Ans: d

11. The partial pressure of O_2 at sea level is

a. 0.79X 760 mmHg
b. 0.45 X 760 mmHg
c. 0.21 X 760 mmHg
d. 0.14 X 760mmHg

Ans: c

12. In the respiratory airways the highest amount of smooth muscle relative to the thickness of the wall is present in

a. Terminal bronchioles
b. Respiratory bronchioles
c. Bronchi
d. Trachea

Ans: a

13. The relaxation volume of lung at which the recoil of the chest and recoil of the lung balance each other is equal to

a. Residual volume
b. Tidal volume
c. Total lung capacity
d. Functional residual capacity

Ans: d

14. While recording pressure- volume curve of the lungs for studying the compliance of the lungs, the curve is shifted upwards and to the left due to

a. Pulmonary congestion
b. Pulmonary emphysema
c. Pulmonary tuberculosis
d. Pulmonary fibrosis

Ans: b

15. The diffusing capacity of the lung for a given gas is directly proportional to

a. Surface area of the alveolocapillary membrane
b. Thickness of the alveolocapillary membrane
c. Molecular weight of the gas
d. Rate of blood flow in the pulmonary capillaries

Ans: a

16. Pulmonary blood flow can be reduced by one of the circulating humoral agent, which is
a. Atrial natriuretic peptide
b. Histamine
c. Vasopressin
d. Adenosine

Ans: d

17. Hypoxic hypoxia is characterized by
a. Reduced PO_2 of the arterial blood
b. Left ward shift of oxy-hemoglobin curve
c. Decreased affinity of hemoglobin for O_2
d. Increased arterio-venous difference of PO2

Ans: a

18. With the normal rate of alveolar ventilation, the rate at which the old gases in the alveoli are removed is
a. One half of the gas removed in 8 seconds
b. One half of the gas removed in 17 seconds
c. One half of the gas removed in 34 seconds
d. One half of the gas is removed in 45 seconds

Ans: b

19. When the V_A/Q is infinity
a. The partial pressure of the gases in alveoli become equal to the dead space air
b. The $PO_2$of alveolar air becomes equal to 159mmHg and PCO_2 becomes equal to 40mmHg
c. The air that is inspired loses no oxygen to blood and gains no CO_2 from blood
d. The partial pressure of oxygen and carbon dioxide become equal to each other

Ans: c

20. If bile salts are absent from the intestinal tract
a. Up to 40% of ingested fats will be lost in the feces
b. There will be no absorption of fat from intestine
c. There will be increased production of cholesterol from liver
d. Absorption of fat as well as carbohydrate and protein will also be impaired

Ans : a

21. Gastric secretion is produced from glands present in multiple sites of the stomach but the most characteristic secretion is produced by
a. The surface cells in the wall of the stomach
b. Stimulation of secretion by the hormone Cholecystokinin
c. The oxyntic glands present in the fundus or body of the stomach
d. The parietal and G cells present in the antrum of the stomach

Ans: c

22. Which of the following is a feature of enteric nervous system
a. It is viewed as the displaced part of the central nervous system concerned with regulation of gastrointestinal function
b. It is connected to CNS via parasympathetic fibers and is under control of the CNS through these fibers
c. The enteric nervous system is present in the submucosal layer and primarily concerned with intestinal secretion
d. The system contains double the number of sensory neurons and interneurons found in the spinal cord

Ans: a

23. The migrating motor complex (MMC)
a. Is initiated by vasoactive intestinal peptide and migratesfrom the distal ileum towards stomach

b. Starts with a period of irregular electrical and mechanical activity and ends with a quiescent period
c. Migrates aborally at a rate of 90mm/min and occurs at an interval of 60 mins
d. Clears the stomach and small intestine of the luminal contents in preparation of the next meal

Ans: d

24. Ammonia in the circulation primarily comes from
a. Liver and gall bladder
b. Colon and kidney
c. Breakdown of red blood cells
d. Muscle metabolism

Ans: b

25. Sensory receptors
a. Are axon terminals of free nerve endings
b. Respond to a wide range of sensory stimulus
c. Are not present in the visceral organs.
d. Provide the first neural representation of the external world

Ans: d

26. A 10-year-old boy presents with difficulty maintaining balance, a wide-based gait, and frequent swaying while standing. Neurological exam reveals truncal ataxia without limb incoordination. There is no history of trauma or infection. Which part of the cerebellum is most likely affected in this case?
a. Lateral cerebellar hemispheres
b. Cerebellar vermis
c. Dentate nucleus associated with fine motor coordination
d. Inferior cerebellar peduncle connecting the cerebellum to the medulla

Ans: b

27.Serum contain all **EXCEPT**

A) Factor VII
B) Factor VIII
C) Factor IX
D) Factor X

Ans: B

28.Allodynia refers to
a. Perception of abnormally intense touch sensation irrespective of the strength of stimulus
b. An exaggerated response to noxious stimuli
c. Pain sensation in response to non-noxious stimuli
d. Burning or electric sensation due to nerve injury

Ans: c

29. Silent nociceptors are found in
a. Joints
b. Skeletal muscle
c. Deeper layers of skin
d. Viscera

Ans: d

30. Opioid receptors are highly concentrated in
a. Dorsal horn of spinal cord
b. Pons
c. Amygdala
d. Thalamus

Ans: a

31. The feed-forward inhibition model of synaptic transmission I cerebellum is seen at the level of:
a. Mossy fibre-granule cell- golgi cell-granule cells

b. Parallel fibres – basket/stellate cells—Purkinje cells
c. Climbing fibres – purkinje cells – deep cerebellar nuclei
d. Motor cortex – cerebellum – Inf. Olive – Cerebellum

Ans: b

32. Spinal cord send ascending pathway to the cerebellum and receive corrective motor commands from cerebellum through –
a. Dorsal and ventral spinocerebellar tracts
b. Cerebello-Olivo spinal tracts
c. Indirectly through the descending extrapyramidal tracts
d. Cerebello-ponto-cerebral tracts

Ans: c

33. The excitatory commands to the extensors of antigravity muscles originate in the subcortical region of
a. Reticular formation of pons, midbrain and medulla
b. Vestibular nuclei of brain stem
c. Red nuclei of mid brain
d. Basal ganglia

Ans: a

34. A 58-year-old man presents with difficulty in using visual information to guide his hand movements, often misreaching for objects despite having no visual or motor deficits. He is diagnosed with optic ataxia. Which cortical dysfunction best explains this patient's sensorimotor deficit?
a. Lesion in the primary motor cortex
b. Lesion in the posterior parietal cortex
c. Lesion in the premotor cortex
d. Lesion in the supplementary motor area

Ans: b

35. A neuroscience researcher is studying a brain region heavily involved in learning and memory through synaptic plasticity. She observes that high-frequency stimulation of presynaptic neurons leads to persistent strengthening of synaptic transmission. Which brain region is most likely being studied, and which receptor is critical for this plasticity?
a. Hippocampus; NMDA receptor
b. Cerebellum; GABA receptor
c. Motor cortex; serotonin receptor
d. Basal ganglia; dopamine receptor

Ans: a

36. During rehabilitation therapy, a stroke patient gradually regains voluntary movement in a weakened limb. It is suggested that previously subthreshold motor circuits have been recruited to compensate.Which synaptic property is most likely contributing to this functional recovery?
a. Lateral inhibition reducing neuronal activation
b. Subliminal fringe neurons becoming activated by converging inputs
c. Synaptic fatigue reducing the strength of connections
d. Absolute refractory period preventing further firing

Ans: b

37. The first reactive change to occur after haemorrhage is :
a. Vasoconstriction
b. Tachycardia
c. Raised cortisol levels
d. Raised catecholamine levels

Ans: a

38. A major site of autoregulatory resistance in the kidney is:
a. Afferent arterioles
b. Efferent arterioles
c. Both (a) and (b)
d. Peritubular capillary plexuses
Ans: a

39. Glomercular filtration rate can be increased by:
a. Increasing arterial blood pressure
b. Increasing the plasma protein concentration
c. Efferent arteriolar dilatation
d. Afferent arteriolar constriction
Ans: A

40.The maximum amount of each substance that can be transported in one minute by the kidney tubules is called as:
a. Tubular absorptive capacity
b. Tubular secretory capacity
c. Filtered load
d. Tubular transport maximum (Tm)
Ans: d

41. True about glomerulo-tubular balance.
a. Renal tubules tend to reabsorb a constant fraction of Na+ filtered rather than a constant amount.
b. Total amount of Na+ reabsorbed by renal tubules stayed constant
c. True only for sodium ions
d. GFR has no role to play
Ans: a

42.Trophic hormones refer to:
a. Hormones secreted from hypothalamus
b. Pituitary gland hormones
c. Hormones that stimulate the secretion of other endocrine glands
d. Hormones of posterior pituitary
Ans: c

43.Deficiency of somatomedin is seen in:
a. Laron dwarf
b. African pygmies
c. Pituitary dwarf
d. Hypothyroid dwarf

Ans: a

44. Lymphoid tissues reach their maximum size:
a. In early childhood
b. During adolescence
c. At puberty
d. At 20 years of age
Ans: c

45. A 30-year-old woman with three children complains of wetting herself during coughing and sneezing, the most probable diagnosis is-
a. Atonic bladder with overflow
b. Stress incontinence
c. Chronic prostatic obstruction
d. Acute retention of urine
Ans: b

46. An increase in the osmolarity of the extracellular compartment will:
a. stimulate the volume and osmo-receptors, and inhibit ADH secretion
b. inhibit the volume and osmo-receptors, and stimulate ADH secretion
c. inhibit the volume and osmo-receptors, and inhibit ADH secretion
d. stimulate the volume and osmo-receptors, and stimulate ADH secretion
Ans: d

47. The term “latch state” refers to the condition of

a. Phasic contraction during which force is maintained at low energy expenditure
b. Tonic contraction during which force is maintained at low energy expenditure
c. Tonic contraction during which myoplasmic calcium returns to the baseline levels
d. Phasic contraction during which myoplasmic calcium returns to the baseline levels

Ans: b

48. A 13 years old girl with fatigue and weakness was found to be having reduced hemoglobin. Her MCV 70Fl, MCH 22pg and RDW was 28. What is the most probable diagnosis?

a. Thalassemia minor
b. Iron deficiency anemia
c. Sideroblastic anemia
d. Thalassemia major

Ans: b

49. A 16-year-old female with pure vegetarian diet had complaints of tingling sensation, numbness and easy fatiguability. Which of the following vitamins deficiency you would suspect

a. Thiamine
b. Niacin
c. Cyanocobalamin
d. Folate

Ans: c

50. A 39 years old man with untreated type I diabetes is brought to the emergency room. An injection of insulin is expected to cause an increase in his

a. urinary glucose concentration
b. blood glucose concentration
c. blood K^+ concentration
d. blood pH

Ans: c

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