

**18****WRITTEN TEST  
NEUROSCIENCE****Test Booklet No.**

Name of Applicant ..... Answer Sheet No. ....

Application ID : ..... Signature of Applicant : .....

Date of Examination: ..... Signature of the Invigilator(s)

1. ....

Time of Examination : ..... 2. ....

**Duration : 1 Hour]****[Maximum Marks : 50****IMPORTANT INSTRUCTIONS**

- (i) The question paper is in the form of Test-Booklet containing **50 (Fifty)** questions. All questions are compulsory. Each question carries four answers marked (A), (B), (C) and (D), out of which only one is correct.
- (ii) On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **50** questions. Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.
- (iii) A separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are **50** rows containing four circles each. One row pertains to one question.
- (iv) The candidate should write his/her Application number at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and **NOWHERE ELSE**.
- (v) No second Test-Booklet/Question Paper and Answer-Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.
- (vi) For every correct answer of the question **One (1) mark will be awarded**. For every unattempted question, Zero (0) mark shall be awarded. **There is no Negative Marking**.
- (vii) Marking shall be done only on the basis of answers responded on the Answer-Sheet.
- (viii) To mark the answer on the Answer-Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.
- (ix) For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the question will be treated as cancelled.
- (x) The candidates should not remove any paper from the Test-Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.
- (xi) Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.
- (xii) *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*
- (xiii) No candidate shall be permitted to leave the examination hall before the expiry of the time.

**DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO.**



1. The linear relationship between the absorbance and concentration of an absorbing species is
  - (A) Beer's law
  - (B) Vander Waals forces
  - (C) Variability
  - (D) None of the above
2. Ultracentrifuge is optimized for spinning a rotor at a very high speed; capable of generating accelerations as high as
  - (A) 20,000,000 g
  - (B) 2,000,000 g
  - (C) 2,00,000 g
  - (D) 20,000 g
3. UV light absorbed by nucleic acid is
  - (A) 26 nm
  - (B) 260 nm
  - (C) 1500 nm
  - (D) 75 nm
4. Which of the following features is correct about micro RNAs?
  - (A) They are not coding, but functional
  - (B) They are coding, but not functional
  - (C) They are not found in human
  - (D) They are structurally almost similar with tumor suppressor genes
5. The "sticky ends" generated by restriction enzymes allow :
  - (A) selection of plasmids lacking antibiotic resistance
  - (B) easy identification of plasmids which carry an insert
  - (C) pieces of DNA from different sources to hybridize to each other and to be joined together
  - (D) replication of transfer RNA with in bacterial cell
6. In blast database, Blastn is used to search for
  - (A) Protein sequences
  - (B) Amino acid sequences
  - (C) Nucleotide sequences
  - (D) All the above

7. Living unstained cells and organisms can be best studied using
- (A) Transmission Electron Microscope
  - (B) Fluorescent Microscope
  - (C) Phase contrast microscope
  - (D) Compound microscope
8. Which of the following enzymes is used for tissue disruption for animal cell culture?
- (A) Pronase
  - (B) Trypsin
  - (C) Collagenase
  - (D) All the above
9. Which one of the following methods is used to screen the protein expression gene library using double stranded DNA as a probe?
- (A) Southern blotting
  - (B) Northern blotting
  - (C) Western blotting
  - (D) South-Western blotting
10. Brian Seed developed ....
- (A) Immunological method to screen genes
  - (B) Recombinational methods to screen gene libraries
  - (C) PCR method to screen gene libraries
  - (D) Oligonucleotide probe based method to screen gene libraries
11. Which neuroglia are responsible for forming the myelin sheath around axons in the peripheral nervous system?
- (A) Ependymal Cells
  - (B) Satellite Cells
  - (C) Schwann cells
  - (D) Oligodendrocytes
12. Which is true about postsynaptic potentials?
- (A) EPSP can summate to produce action potentials
  - (B) IPSP and EPSP's are summed up to produce action potentials
  - (C) IPSP can summate to produce action potentials
  - (D) Threshold Depolarization produces action potentials

13. The absolute refractory period of an action potential is
- (A) Due to closure Voltage gated  $\text{Na}^+$  and  $\text{K}^+$  channels
  - (B) Due to closure Voltage gated  $\text{Cl}^-$  channels
  - (C) Due to closure Voltage gated  $\text{Na}^+$  channels
  - (D) None of these
14. When the neuron expels potassium
- (A) The inside of the cell loses negative ions and produces a negative charge inside
  - (B) The inside of the cell loses positive ions and produces a negative charge inside
  - (C) The inside of the cell loses negative ions and produces a positive charge inside
  - (D) The inside of the cell loses positive ions and produces a positive charge inside
15. The diameter of neurofilament is
- (A) 10 nm
  - (B) 100 nm
  - (C) 0.1 nm
  - (D) 0.01 nm
16. Human somatosensory cortex was mapped by:
- (A) Wilder Penfield
  - (B) Herman Helmholtz
  - (C) Philip Bard
  - (D) Clinton Woolsey
17. During exocytosis of synaptic vesicles the fusion of vesicles with the plasma membrane is catalyzed by :
- (A) Synapsin proteins
  - (B) SNARE proteins
  - (C) Intracellular calcium
  - (D) All the above
18. Which type of neurons are the most populous in the CNS?
- (A) Pyramidal neurons
  - (B) Motor neurons
  - (C) Granule cells
  - (D) Purkinje neurons

- 19.** Microglia in brain are derived from
- (A) Neuroectodermal cells
  - (B) Ependymal cells
  - (C) Bone marrow
  - (D) Immature neuroepithelium
- 20.** Changes in capacitance reveal the time course of
- (A) Exocytosis
  - (B) Endocytosis
  - (C) Both (A) and (B)
  - (D) Other than (A) and (B)
- 21.** Injury to parietal cortex can impair cognitive tasks that require
- (A) Abstract spatial thinking
  - (B) Writing and drawing
  - (C) Execution action
  - (D) Reaching for an object
- 22.** The spinal gray matter in the dorsal horn and intermediate horn is divide into \_\_\_\_\_ layers.
- (A) 7
  - (B) 6
  - (C) 5
  - (D) 4
- 23.** Stationary night blindness results when \_\_\_\_\_ function is lost.
- (A) Cone photoreceptor
  - (B) Rod photoreceptor
  - (C) Both Rod and cones
  - (D) Optic nerve
- 24.** Occipital cortex is related to
- (A) Cortical blindness
  - (B) Object agnosia
  - (C) Motor deficits
  - (D) All the above

- 25.** Reuptake of neurotransmitters from the synaptic cleft is performed by
- (A) Astrocytes
  - (B) Microglia
  - (C) Postsynaptic cell
  - (D) All the above
- 26.** In the choroid plexus water from capillaries is transported directly into the cerebrospinal fluid by what structure(s)?
- (A) Ependyma
  - (B) Astrocytes
  - (C) Endothelial cells
  - (D) All the above
- 27.** Damage to which lobe can produce disruptions to social and emotional behaviour?
- (A) The occipital lobe
  - (B) The temporal lobe
  - (C) The frontal lobe
  - (D) The parietal lobe
- 28.** The major structure that connects the two hemispheres is called
- (A) Anterior commissure
  - (B) Fornix
  - (C) Corpus callosum
  - (D) Projection Fibers
- 29.** Attention deficit hyperactivity disorder (ADHD) is associated with reduced or impaired
- (A) GABA
  - (B) Glutamate
  - (C) Dopamine activity
  - (D) None of the above
- 30.** Which of the following statements is correct regarding the voltage-gated Na<sup>+</sup> (sodium) channel?
- (A) It is in an open state at the resting membrane potential
  - (B) It is blocked by local anesthetic drugs
  - (C) It can be activated during the falling phase of the action potential
  - (D) None of the above

31. \_\_\_\_\_ supports synaptic signalling.
- (A) Microglia
  - (B) Astrocytes
  - (C) Interneurons
  - (D) All the above
32. Injury to parietal cortex can impair cognitive tasks that require
- (A) Abstract spatial thinking
  - (B) Writing and drawing
  - (C) Execution action
  - (D) Reaching for an object
33. Tactile acuity in the humans is highest at \_\_\_\_\_
- (A) Breast
  - (B) Palmar surface
  - (C) Thumb
  - (D) Finger tips
34. The concept of Neuron Doctrine was forwarded by
- (A) Camillo Golgi
  - (B) Ramon Y. Cajal
  - (C) Charles Sherrington
  - (D) Eric Kandel
35. Anterior-posterior patterning of nervous system is controlled by :
- (A) Pax genes
  - (B) SHH signalling
  - (C) Hox genes
  - (D) BMP signalling
36. Noble prize for neurotrophic hypothesis was awarded to
- (A) Rita Levi-Montalcini
  - (B) Torstein N. Wiesel
  - (C) Eric Kandel
  - (D) Otto Loewi
37. Human somatosensory cortex was mapped by :
- (A) Wilder Penfield
  - (B) Herman Helmholtz
  - (C) Philip Bard
  - (D) Clinton Woolsey

38. During exocytosis of synaptic vesicles the fusion of vesicles with the plasma membrane is catalyzed by :
- (A) Synapsin proteins
  - (B) SNARE proteins
  - (C) Intracellular calcium
  - (D) All of the above
39. Saccadic eye movement is to :
- (A) Keep the image of the moving target static
  - (B) Shift of fovea rapidly to a new visual target
  - (C) Eye movements to opposite direction
  - (D) Image holding
40. Alzheimer's disease associated APP genes are located on chromosome number
- (A) 19
  - (B) 14
  - (C) 5
  - (D) 21
41. The CGG triplet repeats may be approx. \_\_\_\_\_ in Fragile X syndrome.
- (A) 100
  - (B) 200
  - (C) 800
  - (D) 1000
42. Radioactive glucose is used in
- (A) EEG
  - (B) PET
  - (C) FMRI
  - (D) SPECT
43. Broca's area is related to
- (A) Understanding what others say
  - (B) Ability to speak
  - (C) Reading
  - (D) Lung function
44. Thalamus is a relay for all sensory information *except*
- (A) Smell
  - (B) Vision
  - (C) Touch
  - (D) Temperature

- 45.** Synaptic vesicles discharge transmitter by exocytosis and are recycled by
- (A) Lysosomes
  - (B) Astrocytes
  - (C) Endocytosis
  - (D) None of the above
- 46.** Ion channels are related to
- (A) Recognition and selection of specific ions
  - (B) Response to specific electrical, mechanical or chemical agents
  - (C) Conducting ions across the membrane
  - (D) All the above
- 47.** Cerebrospinal fluid is produced by
- (A) Astrocytes and ependymal cells
  - (B) Chroid plexus and ependymal cells
  - (C) Radial glial cells
  - (D) Spinal cord
- 48.** During night vision which photoreceptors are active?
- (A) Cones
  - (B) Rods
  - (C) Rods and cones
  - (D) Optic neurons
- 49.** The patterning of the nervous system along the anterior-posterior axis in embryo is controlled by
- (A) Pax genes
  - (B) Hox genes
  - (C) SHH signalling
  - (D) BMP signalling
- 50.** Synaptic vesicles discharge transmitter by exocytosis and are recycled by
- (A) Lysosomes
  - (B) Astrocytes
  - (C) Endocytosis
  - (D) None of the above

## ROUGH WORK

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