Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Master's Degree Examination – June 2021
IV Semester

Class : II M.Sc. **Time: 3 Hours**
Major : Biochemistry **Max. Marks: 100**

17MBCC22 Neurochemistry

PART A **10 x 1 = 10**
Choose the Correct Answer

1. Which term describes the space between a neuron and its target cell? CO1K1
   a. Post synaptic membrane b. Synaptic cleft
   c. Dendritic spine d. Axon Terminal

2. Electrical stimulation of the reticular formation would most likely cause an animal to: CO2K3
   a. Sneeze b. become blind
   c. wake up if it had been sleeping d. stop breathing

3. The change in electrical charge that occurs in a neuron when a nerve impulse is transmitted is known as the: CO2K4
   a. action potential b. synaptic change c. refractory period d. ionic charge

4. Schizophrenia and Parkinson's disease are both linked to changes in which neurotransmitter? CO3K4
   a. Serotonin b. Glutamate c. Dopamine d. Acetylcholine

5. The limbic system includes the: CO3K2
   a. amygdala, hypothalamus, hippocampus b. hypothalamus, medulla, hippocampus
   c. hippocampus, pons, thalamus d. cerebellum, pons, hypothalamus

6. The _____ is to feeling fear as the _____ is to feeling pleasure CO4K5
   a. pons/medulla b. amygdala/hypothalamus
   c. thalamus/hypothalamus d. cerebellum/amygdale

7. The effect of neurotransmitters may be: CO3K2
   a. chemical or electrical b. excitatory or inhibitory
   c. positive or negative d. active or passive

8. The terminal buttons of a neuron are located at the end of its: CO4K5
   a. Axon b. Dendrite c. myelin sheath d. nodes of ranvier

9. Which lobe is most closely associated with visual processing? CO4K5
   a. Frontal b. Temporal c. Parietal d. Occipital

10. Communication within neurons is ____, communication between neurons is_____ CO4K4
    a. excitatory, inhibitory b. inhibitory, excitatory
    c. chemical, electrical d. electrical, chemical

Part B **5 x 6 = 30**

Answer ALL questions

Each answer should not exceed 400 words or two pages

11.a. Explain in detail the chemical composition of Brain CO1K1

(or)

11.b. Write a note on spinal cord CO1K2

12.a. Describe the organization of ANS, Explain in brief how ANS coordinates PNS? CO2K4

(or)

12.b. How neural proteins mediate physiological and biochemical response? CO3K5

13.a. Which environmental factor affects the development of CNS? CO3K4

(or)

13.b. What are neurotransmitters? Describe in detail the synthesis, storage and uptake of neurotransmitters. CO3K4

14.a. Explain how sound generates potential of hair cells CO1K2

(or)

14.b. Describe the ultra structure, function and ion selectivity of acetylcholine receptors CO4K5

15.a. Describe the properties of an electrode synapse, the way impulses are transmitted and the advantages of an electrical synapse. CO3K4

(or)

15.b. Humans can discriminate between many different tests. What are the mechanisms that make this possible? CO5K5

Part C **5 x 12 = 60**

Answer ALL questions

Each answer should not exceed 800 words or four pages

16.a. Define and identity on a diagram of a neuron, the following regions: dendrites, axon, axon hillock, soma and synaptic cleft. CO1K1

(or)

16.b. Describe the roles of the cerebellum in the regulation of skilled movement. CO2K3

17.a. What are fundamental differences between chemically gated and voltage gated channels. CO3K5

(or)

17.b. Explain the characteristics of neurotransmitters. CO2K2

18.a. Differentiate main functional properties of electrical and chemical synapse. CO3K3

(or)

18.b. Explain the structure of hypothalamus, including the major hypothalamic nuclei. CO4K1

19.a. Describe chemical neurotransmission, listing in correct temporal sequence events beginning with the arrival of a wave of depolarization at the presynaptic membrane and ending with a graded potential generated at the post-synoptic membrane. CO4K5

(or)

19.b. Explain the synaptic pathways, inactivation mechanism and neurochemical anatomy and mechanisms of receptor transduction for the following CO4K5

a. Catecholamine b. Acetylcholine

20.a. Describe the role played by astrocytes in the inactivation of neurotransmitter GABA. Discuss with examples how dysfunction of GABA inactivation adversely affects neuronal activity. CO4K5

(or)

20.b. Describe the mechanism of Transport by VMATs, giving examples, Discuss cooperative and overlapping functions of VMAT2 with other vesicular transporters in the brain. CO5K6