Register Number:……..

KUMARAGURU
college of technology
character is life

B.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Sixth Semester

BIOTECHNOLOGY

U18BTE0008: Neurobiology and Cognitive Sciences

COURSE OUTCOMES

CO1: Comprehend the central and peripheral nervous system, and describe the structure and functions of neurons and supporting cells.

CO2: Analyze the mechanism of action potential conduction and working of voltage dependent channels.

CO3: Illustrate the concept of synaptic transmission and mechanism of action of neurotransmitters.

CO4: Evaluate mechanism of sensations and skeletal muscle contraction.

CO5: Enumerate the mechanisms associated with motivation behaviors.

CO5: Summarize the various disorders of nervous system.

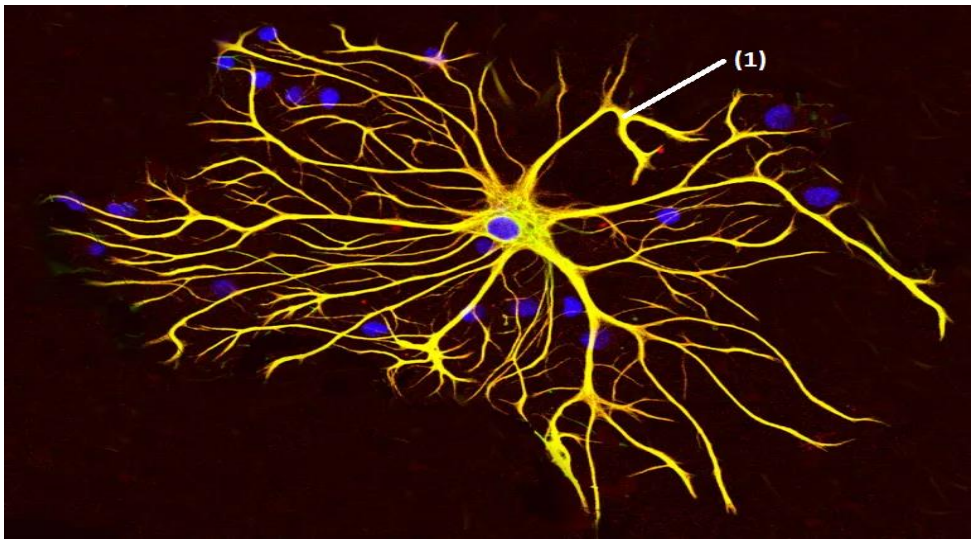
Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

1. Observe the depicted fluorescence image of a neuron below. Identify its type and name the labelled part. CO1 [K_3]

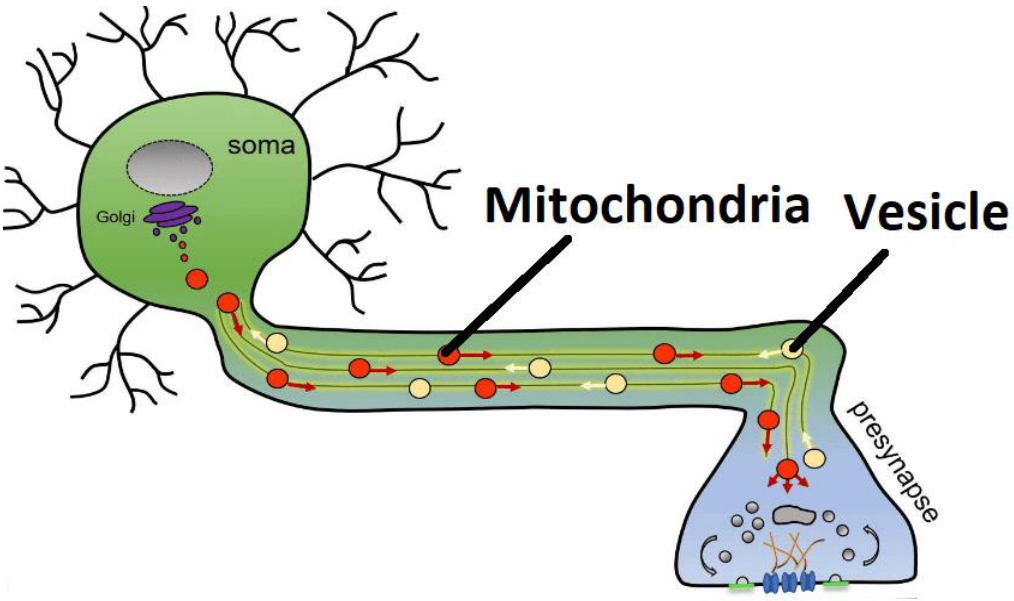


2. Outline any TWO functions of CSF. CO1 [K_2]
3. How are impulses conducted between the two neurons under electrical transmission process? CO2 [K_2]
4. Ouline the simple principle of movement of sodium ions in a voltage gated channel. CO2 [K_2]

5.	"The influx of calcium (Ca2+) ions into the axoplasm of a pre-synaptic neuron is essential for action potential process". Justify the statement with a suitable reason.		CO3	[K_4]
6.	List few amine (biogenic) related neurotransmitters.		CO3	[K_2]
7.	Write the significance of taste pores.		CO4	[K_2]
8.	List the specific neurotransmitters responsible for vision.		CO4	[K_2]
9.	Define the sleep.		CO5	[K_2]
10.	What is Agarophobia?		CO6	[K_2]

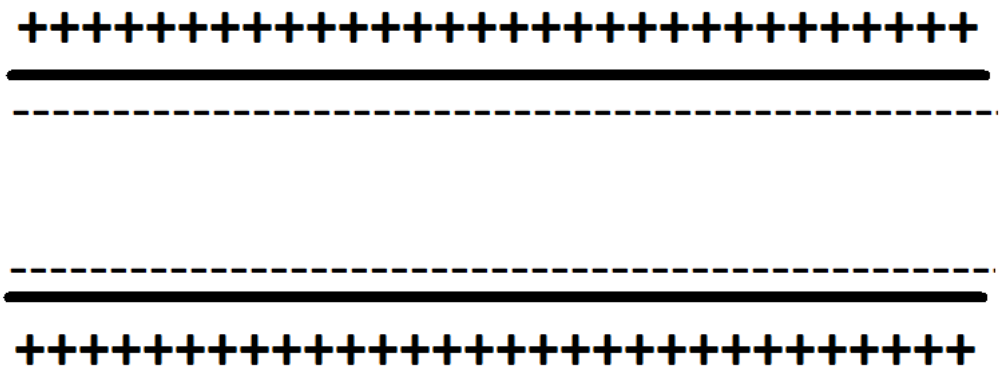
Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Classify the nervous system with suitable examples.	10	CO1	[K_2]
	b)	Observe the depicted image of a neuron below.	6	CO1	[K_3]



How effectively the mitochondria and vesicles with secretory proteins can be transported across the entire length of axon?

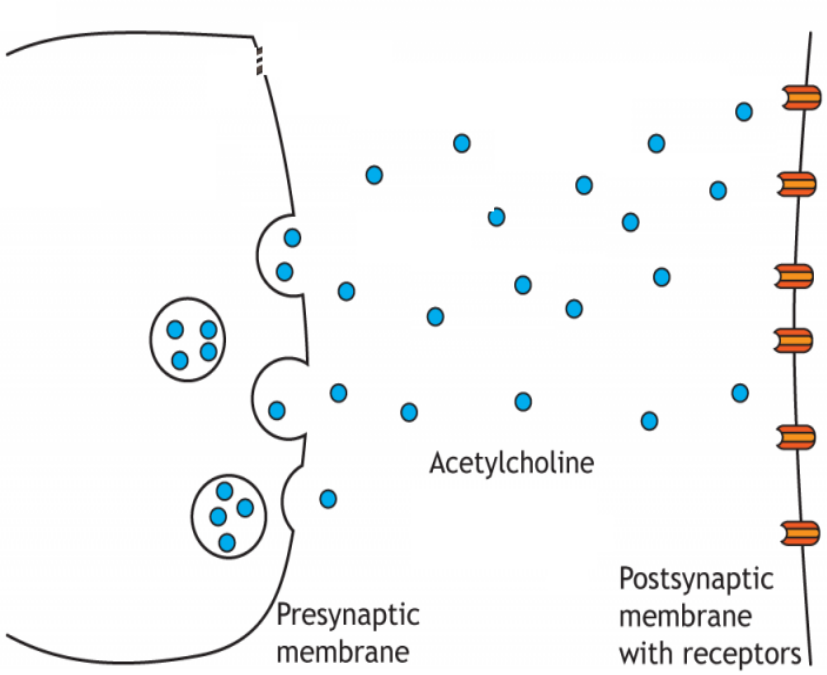
12.	a)	Describe the mechanism of conductance of action potential between the neurons.	10	CO2	[K_2]
	b)	Read the statement and observe the projected image, and answer the question. "Under resting condition, high concentration of sodium ions and high concentration of potassium ions are observed in the extracellular space and intracellular axoplasm, respectively".	6	CO2	[K_5]



How is a strong electronegativity maintained inside a neuron in spite of high potassium ion level?

13. a) Explain the mechanism of action of dopamine mediated neurotransmission. 10 CO3 [K_2]

b) Observe the depicted image of proximity of synaptic junction and answer the following: 6 CO3 [K_4]



i) How is the released acetylcholine recycled?

ii) Can you annotate the synthesis of acetylcholine in a pre-synaptic neuron?

14. a) Discuss in detail the neurophysiology operated during "DARK" condition under visual process. 10 CO4 [K_2]

	b)	Assume that you are crave towards consumption of citrus fruits and its juices. Elaborate in crisp about the neural action mediated due to the above cited fruit items.	6	CO4	[K_3]
15.	a)	Elaborate in brief the influence of hormones and neurotransmitters in the regulation (stimulation or inhibition) of feeding of food.	10	CO5	[K_2]
	b)	List few physiological activities executed by the hypothalamus.	6	CO5	[K_2]
16.	a)	Explain the cause (etiology), characteristic features (symptoms) and treatment of Parkinson's disease.	10	CO6	[K_2]
	b)	Write a short note on epilepsy.	6	CO6	[K_2]

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