Shahjalal University of Science & Technology, Sylhet
Department of Biochemistry and Molecular Biology
4th Year 2nd Semester B. Sc. (Hons) Final Examination, 2014
Course No. : **BMB 431** Course Title: **Neurobiochemistry**
Credit: **3.0** Total marks: **70** Time: **3** hours

Instructions:

- *Number in the right side indicates the marks of the question.*
- *Marks for each question are same.*
- *Answer any two (2) questions from each Part (A and B).*

Part A

1.	a)	What are the different brain structures? Write down the functions of different brain structures.	5.0
	b)	Justify that- "The brains have slightly different degrees of folding in the cerebral cortex."	2.5
	c)	Discuss different methods for studying the brain and its relationship to behavioral complexity.	3.5
	d)	What are glial cells? Write down the functions of glial cells.	3.0
	e)	What is myelin and myelination? Explain the role of oligodendrocytes on myelination.	3.5
2.	a)	Justify that- "Microglial cells are mediators of immune responses in nerve tissue."	2.5
	b)	What is blood brain barrier? Discuss the anatomy of blood brain barrier.	3.0
	c)	Discuss the transport properties of blood brain barrier (BBB). How different molecule transport through the blood brain barrier?	6.0
	d)	Justify – "Stroke, multiple sclerosis, inflammations are involved with the disturbance of blood brain barrier."	3.5
	e)	Show the differences between oligodendroglia and microglia.	2.5
3.	a)	What is a synapse? Discuss the different types of synapses.	3.5
	b)	Explain the steps involved in transmission at a typical chemical synapse.	3.5
	c)	What is action potential? Briefly illustrate the ionic basis of action potential.	4.5
	d)	What is a synaptic vesicle? Demonstrate the recycling of synaptic vesicles.	3.0
	e)	How neurotransmitter release is affected by tetanus and botulinam toxins?	3.0

Part B

4.	a)	Define neurotransmitter with example. What are the criteria of being a neurotransmitter?	2.5
	b)	What is peptide neurotransmitter? Briefly discuss the synthesis of peptide neurotransmitter.	3.0
	c)	What is neurotransmitter receptor? Discuss the different types of neurotransmitter receptors with their functions.	5.0
	d)	Discuss the slow axonal and fast axonal transport of neurotransmitter in the neuronal cell.	4.0
	e)	What is Huntington's disease? Why it is polyglutamine disease?	3.0
5.	a)	Write down the neuropathological features and clinical features of Alzheimer's disease.	3.0
	b)	Justify that- "ε4 allele of apolipoprotein E is a major genetic risk factor for late-onset Alzheimer's disease."	4.0
	c)	Which genes are involved with Parkinson's disease? Discuss the genetic hypothesis of Parkinson's disease.	4.5
	d)	What are clinical symptoms of Flaccid paralysis? Discuss the mechanism of causing Flaccid paralysis by the neurotoxins.	2+4
6.	a)	Write down the copper metabolism in human? How it is associated with Wilson's disease?	5.0
	b)	How does long-term memory form from short-term memory?	3.0
	c)	Why ketone body metabolism is important for brain?	3.0
	d)	What is growth spurt of brain? Diagrammatically show that the brain grows and developments in three consecutive phase.	4.0
	e)	Justify that- "Adult brain is resistant to nutritional insufficiency but highly susceptible to a break in blood oxygen or glucose supply."	2.5