001/22

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), February - March 2022

Subject: Physiology **Full Marks : 100**
Paper : II **Time : 3 hours**

*Attempt **all** questions. The figures in the margin indicate full marks.*

1. a) A 49 year old woman was brought to the Emergency department 2 hours after the onset of hemiplegia and aphasia during a transatlantic flight. Examination revealed evidence of acute ischemic stroke. Additional diagnostic studies were performed.
   i) Define Aphasia
   ii) Describe briefly the different forms of Aphasia.
   iii) Differentiate between features of Upper and lower motor neuron lesion.
   iv) Describe briefly the different forms of memory and the areas of the brain associated with them.
   v) Add a note on synaptic plasticity. 1+4+3+5+2
   b) With the help of a diagram discuss in brief the juxta-glomerular apparatus. Enumerate the important regulators of rennin secretion. Describe the mechanism of formation of anigiotensin II and its physiological effects. 2+3+3+3+4

2. a) Draw a diagram of visual pathway. Enumerate the effects of lesions at different levels of visual pathway. What are the layers of retina? 4+3+3
   b) Describe the hypothalamic and peripheral control of Growth Hormone secretion. Add a note on Acromegaly and Gigantism. 7+3
   c) Describe the neurochemical mechanisms promoting sleep and arousal. Enumerate the stages of Sleep. Add a note on circadian rhythm. 5+3+2

3. Write short notes on the following: 2x5
   a) Gate control theory of pain.
   b) Physiology of lactation.

4. Explain the following statements: 5x4
   a) Vasa recta is essential for concentration of urine.
   b) Thalamic nuclear activity is the source of EEG waves.
   c) Renal hypotension triggers rennin activity.
   d) Dissociated sensory loss occurs in Syringomyelia.
   e) Smell sensation is lost in COVID.

5. Choose the correct option of each of the following: 10x1
   i) All are true regarding glomerular filtration except,
   a) The rate is 7.5 liter per hour.
   b) The capillary hydrostatic pressure gradually decreases along the glomerular capillary plexus.
   c) The capillary oncotic pressure gradually increases along the glomerular capillary plexus.
   d) The substances having molecular weight 2000 are freely filtered.

ii) Structure of brain involved in emotion:
a) Neocortex.
b) Thalamus.
c) Limbic system.
d) Basal ganglia.

iii) Ability to appreciate the shape and size of an object placed in the hand is lost in lesion of
a) Tractus Gracilis.
b) Tractus Cuneatus.
c) Spinoreticular Tract.
d) Anterior spinothalamic tract.

iv) The hormone AVP causes,
a) Fall in systemic arterial blood pressure.
b) Decrease water permeability of cortical collecting tubule.
c) Increase urea permeability in inner medullary collecting duct (IMCD).
d) Stimulate $Na^{+}Cl^{-}$symport (NCC).

v) Insulin increases the entry of glucose into:
a) All tissues.
b) The mucosa of the small intestine.
c) Most neurons in the cerebral cortex.
d) Skeletal muscle.

vi) The neurotransmitter at the postganglionic sympathetic neuron is :
a) Acetylcholine.
b) Noradrenaline.
c) Adrenaline.
d) Dopamine

vii) Secretion of prolactin is affected by:
a) GnRH analogue.
b) Dopamine.
c) Serotonin.
d) FSH.

viii) The NREM sleep is characterized by all except:
a) One hour duration.
b) Sleep spindles are seen in EEG waves.
c) Profound hypotonia.
d) It has 4(four) stages.

ix) Bitemporal Hemianopia is due to:
a) Injury to the temporal lobes bilaterally.
b) Disruption of the optic nerve fibres arising from the temporal retina.
c) Damage to the optic chiasma.
d) Loss of vision in the Midline half aspect.

x) Which set of hormones have nuclear receptor:
a) Estrogen, thyroxin, glucagon.
b) Estrogen, TSH, GnRH.
c) Thyroxin, retinoic acid, LH.
d) Estrogen, cortisol, testosterone.