

Group - A

1. Answer *any five* questions :

2×5

- (a) Write down the full form of JAK-STAT. (b) Which signal transduction pathway is used by CO at the cellular level of its action? (c) State any two function of astrocytes. (d) Does the MEPP develop due to the non-quantal release of neurotransmitter? Explain your answer. (e) Why does not the regeneration of neurones occur in the central nervous system? (f) What do you understand by the triad of skeletal muscle? (g) Mention the function of nebulin. (h) What is meant by relative refractory period?

Group - B

2. Answer *any two* questions

5×2

- (a) Discuss briefly how the cycling of Ca^{2+} can act as the intracellular messenger.
 (b) Describe with diagram the processes of myelinogenesis in central and peripheral nervous system.
 (c) Discuss the role of K^+ leaky channels and $Na^+-K^+-ATPase$ in the development and maintenance of resting membrane potential.
 (d) Describe the phenomena of 'summation of stimuli' and 'summation of contractions'.

Group - C

Answer *any three* questions.

10×3

3. (a) Describe the SMAD pathway of signal transduction. (b) State the role of Ras, Raf, Sos and MAP kinase in cellular actions.

6+4

4. (a) What physico-chemical attributes should a biomolecule have to call it a neurotransmitter? (b) Describe briefly the process of neurotransmitter release from the presynaptic neuronal endings.

3+7

5. (a) Describe the length-tension and force-velocity relationship that occur during isotonic contraction of skeletal muscle. (b) What is Fenn effect? (5+3)+2

6. (a) What is transneuronal degeneration? Give an example. (b) What do you understand by denervation hypersensitivity? (c) State any four characteristics of motor units. (2+1)+3+4

7. (a) Describe the localization and functions of dihydropyridine receptors and myosin light chain kinase.

(b) How does the external length of skeletal muscle remain constant during isometric contraction? (3+3)+4

PHYSIOLOGY—HONOURS—2019

2nd Semester—Paper : CC-4

Full Marks : 50

Group - A

1. Answer *any five* questions : 2×5

- (a) What are climbing and mossy fibres? (b) What is referred pain?
 (c) Explain "alpha block". (d) What is meant by ephaptic transmission?
 (e) What is Bell-Magendie Law? (f) What is evoked potential? (g) What is foramen of Luschka? (h) Explain "summation" and "subliminal fringe" properties of reflex action. (i) What is meant by "Consolidation of Memory"? (j) What is Blood-Brain barrier ?

Group - B

2. Answer *any two* questions from the following :

(a) Discuss how cardiac functions and gastro-intestinal functions are regulated through Autonomic Nervous System. 5

(b) Describe the analgesic neural pathway modulating the pain sensation. 5

(c) Write note on intercollicular decerebrate rigidity. 5

(d) Describe the structure and functions of different types of GABA receptors. 2+3

(e) Name the Extrapyramidal tracts and mention their function. 2½+2½

Group - C

3. Answer *any three* questions from the following : 5+5

(a) (i) Explain the neurological basis of EEG.

(ii) Distinguish between explicit and implicit memory.

(b) (i) What is gamma motor neurone?

(ii) How cerebellum helps in the act of locomotion? 4+6

(c) Describe the principles of CT scan, MRI and PET scan. 3+3+4

(d) (i) Describe formation, circulation and functions of C.S.F.

(ii) What is Hydrocephalus? (4+2+2)+2

(e) (i) State the location of sensory and motor speech area. 4+2+4

(ii) What is Aphasia?

(iii) Classify different types of Aphasia. 4+2+4

(f) (i) Write the sensory-motor changes that occur after hemisection of spinal cord below the level of section.

(ii) Differentiate between REM and NREM sleep. 6+4

(g) Write short notes on *any two* of the following : 5×2

(i) Dopamine Receptor (ii) Acetylcholine Receptor (iii) Serotonin Receptor (iv) Glutamate Receptor.