

2019

**PHYSIOLOGY — HONOURS**

**Paper : CC-3**

**Full Marks : 50**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**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 functions 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  $\text{Ca}^{2+}$  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  $\text{K}^+$  leaky channels and  $\text{Na}^+-\text{K}^+-\text{ATPase}$  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

**Please Turn Over**

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
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