

2017

M.Sc.

1st Semester Examination

HUMAN PHYSIOLOGY

PAPER—PHY-104

Subject Code—30

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

(Unit—07)

Answer *all* questions from the following :

1. (a) Define neurotrophins..
(b) Discuss briefly about the signalling pathways associated with different neurotrophins.

(Turn Over)

- (c) What is Netrin? 1+3+1

Or

- (a) With a neat diagram describe the structure of neuromuscular junction.
- (b) Give examples of two drugs acting at the neuromuscular junction.
- (c) Describe the ultra-structural features of gap junction in electrical synapse. 2+1+2
2. (a) Discuss the role of basal ganglia in regulation of movement.
- (b) What are medium spiny neurones?
- (c) 'Disinhibition in the basis of expression of striatal function'—Explain. 2+1+2

Or

- (a) What is physiological nystagmus?
- (b) Discuss the mechanism of transduction of vestibular hair cells. 1+4
3. (a) Discuss the differences between classical conditioning and operant conditioning.

(b) What do you understand by positive and negative reinforcement in operant conditioning?

(c) What is gill withdrawal reflex (GWR) of *Aplysia* and how is this model used in describing habituation.

1+2+2

Or

(a) Discuss the cellular and molecular basis of memory.

(b) What are sleep spindles and K-Complex? 4+1

4. (a) Discuss the characteristics of endothelial cells lining the blood brain barrier.

(b) What are ABC transporters and mention their role in the blood brain barrier?

(c) What are the features associated with Glut-1 haploinsufficiency? 2+2+1

Or

(a) What is jet lag?

(b) CSF acts as hydraulic shock absorber—Explain.

- (c) Give examples of two physiological processes associated with circadian rhythm.
- (d) What do you understand by free running rhythm?
1+2+1+1

(Unit—08)

Answer *all* questions from the following :

1. (a) What is homeostasis ?
- (b) Describe the role of different effectors in response to low and high temperature. 1+(2+2)

Or

- (a) What is positive and negative feedback in homeostatic control ?
- (b) Describe the pathways that alter homeostasis. 2+3
2. (a) Discuss about vascular low-pressure volume sensors and hepatic sensors.
- (b) Mention the signals involved in the control of renal NaCl and water excretion. (1+1)+3

Or

(a) What is GALT?

(b) State the immune mechanisms that protect the GI tract mentioning the role of GALT, macrophages and dendritic cells.

1+4

3. (a) Write the role of platelet controlling hemostasis mechanism.

(b) What is Von Willbrand factor?

(c) Critically explain the process of secondary hemostasis.

2+1+2

Or

(a) Briefly describe the importance of low molecular wt. heparin.

(b) How does plasminogen maintain the anti-coagulant properties in circulatory system?

(c) What is coumarin?

2+2+1

4. (a) What is artificial G-force?

(b) Cite the factors which determine the tolerance to G-forces.

- (c) Discuss the effects of negative G-forces on physiological system. 1+2+2

Or

- (a) state the reactions of oxygen and nitrogen free radical in mammalian cells.
- (b) Discuss the regulation of redox-sensitive interacting proteins. 3+2
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