M.Sc. 3rd Semester Examination, 2015

HUMAN PHYSIOLOGY

PAPER – H.PHY-303(Unit-29 & 30)

Full Marks : 40

Time : 2 hours

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

Write the answers to questions of each Unit in separate books

UNIT — 29

1. What do you know about 'Mathematical modelling of metabolism' in system biology? How 'Metabolic networks analysis' can accomplished? 2 + 3

(Turn Over)
Or

Write a note on 'Cell Signalling Pathways Models'. State the 'Functional Modules in Signalling Pathways'.

2. What is intrinsic heart rate? Describe the effects of four equal doses of atropine and propranolol on the heart rate with a suitable diagram.

Or

What is respiratory sinus arrhythmia? Describe its generation with proper diagram.

3. State the vasoactive roles of prostaglandins and thromboxanes, nitric oxide and endothelins.

Or

Describe flow and diffusion-limited transport from capillaries to tissue.

4. Discuss the role of lungs as a lymphoid tissue.
Or

Describe the role of lungs in muco-ciliary clearance. What is pneumoconiosis? 3 + 2

UNIT – 30

1. (a) What is aversion learning? Why it is called one-trial learning?

(b) Discuss the molecular basis of habituation in Aplysia? 1 + 1 + 3

Or

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

(b) How does the NMDA-receptor act as a coincidence-detector during long-term potentiation (LTP)? 3 + 2

2. (a) What are REM-ON and REM-OFF cells?

(b) What are PGO waves? What is its physiological significance?
(c) What is narcolepsy?  

\[ 2 + 2 + 1 \]

Or

(a) Discuss in brief the molecular mechanisms governing circadian clocks in mammals.

(b) What are Zeitgebers?  

\[ 3 + 2 \]

3. (a) What are "Pleasure Centres" and "Punishing Centres"?

(b) State Kluver-Bucy syndrome?

(c) What is septum pellucidum?  

\[ 2 + 2 + 1 \]

Or

(a) Describe the role of tight junction proteins at the blood-brain barrier.

(b) Discuss the different types of transport mechanisms at the blood-brain barrier.  

\[ 2 + 3 \]

4. (a) Discuss how cerebellum is involved in motor learning.
(b) Discuss the role of cerebellum in adaptability of vestibulo-ocular reflex.  

Or

Discuss briefly the anatomical organization and functions of medial column of reticular nuclei. What is raphe nuclei?