PG/II/HP./VI/07

2007

HUMAN PHYSIOLOGY

PAPER-VI

Full Marks : 100

Time : 4 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 whenever necessary

Write the answers to Questions of each Unit **in a separate books**

UNIT-11

Answer Q. No. 1 and any two from the rest

1. Write short notes on any *two* of the following : 5x2

(a) Somatostatin.

(b) Physiological importance of hypothalamo-hypophyseal-portal system of vessels.

(c) The role of melatonin in the regulation of reproductive axis.

(d) LATS.

2. **(a) Elaborate the synthesis and release of vasopressin.**

(b) Discuss the role of vasopressin in volume (osmotic) and pressure regulation.

(c) Write briefly about the cellular autoimmune mechanism in type-**I diabetes mellitus** $(4+3)+(4\frac{1}{2}+2\frac{1}{2})+6$

3. (a) Discuss the molecular mechanism of thyroid peroxidase in iodide organification.

(b) Differentiate between paracellular and transcellular routes of calcium transport.

(c) `Parathyroid hormone plays an important role in calcium homeostasis.'-justify it.

(d) What do you mean by primary **and secondary osteoporosis** ? 6+4+6+4

4. **(a) State the** effect of fructose 2, 6-bisphosphate on the activity of PFK1 and Fructose-bis-phosphatase 1.

(b) Describe how pancreatic hormones regulate carbohydrate metabolism through Fructose-2, 6-bis-phosphate

(c) Describe the role of mineralocorticoid in sodium and potassium metabolism. What is aldosterone escape? 2+(3+5)+(8+2)

S. (a) Write a brief note on maturation of sperm during epididymal transport.

(b) What do you mean by capacitation of sperm?

(c) What biochemical modification the spermatozoa undergo during the process of capacitation?

(d) Discuss the specific roles played by different zona pellucida proteins in the process of fertilization. 3+3+6+8

UNIT-12

Answer Q. **No. 1 and any two from the rest**

1. Answer any *two* of the following : 5×2

(a) Describe the countercurrent multiplier system in kidney.

(b) Discuss the mechanism of chemorereptor stimulation in carotid body with **emphasis on 02 sensitive K' channels.**

(c) Describe the structure of nAChR with the mechanism of its gating.

(d) Discuss the neural regulation of gastric emptying.

2. **(a) What do you mean by feedback and feedforward regulation ? Describe the basic components of these systems with the functions of each component.**

(b) What is adaptive control system ?

(c) What are the factors affecting the stability of feedback control system ? Discuss the role of different types of sensors in controlling stability of the system. (2+8)+2+(3+5)

3. **(a) What are meant by oxygen toxicity at reduced and increased atmospheric pressure ? Describe the effects of oxygen toxicity on lung and eyes.**

(b) Discuss the mechanism of acclimatization in extreme hot and cold environment. (2+6+2)+(5+5)

4. **(a) What do you mean by oxidative stress? Describe the changes in DNA molecule due to oxidative stress.**

(b) How do the vit-C and vit-E act as antioxidant?

(c) Name the non-radial reactive nitrogen species. (2+8)+(4+4)+2

5. **(a) State the role of biophysical factors in the dyamic exchange of body fluid across blood capillaries with special reference to plasma protein. Why edema can be seen on the skin surface due to blunt injury?**

(b) How is the basal vascular tone developed? Discuss different characteristics of vasoconstrictor nerves that affect vascular tone.

(c) Discuss how metabolic, neurohumoral and endothelial factors modulate coronary circulatior. (4+1)+(2+3)+(3+4+3)