[This question paper contains 6 printed pages ]

*Your Roll No* . . .

**5803** **J**

**B.Sc. (Hons.)/II**

BIOCHEMISTRY—Paper VIII

(Human Physiology and Endocrinology)

(Admissions of 2000 and onwards)

*Time* 3 *Hours* *Maximum Marks* 60

*(Write your Roll No on the top immediately on receipt of this question paper )*

*Attempt* **Five** *questions in all, including Q No.* 1 *which is compulsory*

1. (a) Name the following molecule/condition

$0.5 \times 12 = 6$

(i) The domain that allows binding to phosphotyrosine residues

(ii) Epinephrine, norepinephrine and dopamine belong to this class of molecules

(iii) The molecule responsible for decreasing FSH secretion only

(iv) The molecule used to detect the GFR

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(v) The condition of increased RBC numbers in circulation

(vi) A plasma functional enzyme indicative of liver damage.

(vii) A detached blood clot flowing free in circulation.

(viii) Irregular heart beat

(ix) Movements in the small intestine and oesophagus

(x) Irregular menstrual flow

(xi) Production of hormone by the wrong tissue

(xii) The measurement of the electrical activity of the heart

(b) Explain in brief .

(i) Kidney is also considered as an endocrine organ 2

(ii) SA node is the pacemaker of the heart 1 5

(iii) Hyperglycemia is not a confirmatory symptom of Diabetes Mellitus 2

(iv) Deficiency of Vitamin K can lead to clotting disorders 1

(v) Cholera leads to acute diarrhoea and vomitting 2

(vi) Goitre is a symptom of both hyper and hypo thyroidism 1 5

2 (a) Comment on the following $1.5 \times 6 = 9$

(i) Deficiency of Ceruloplasmin can precipitate Fe deficiency.

(ii) Lesions in the hypothalamus leads to hyper prolactenemia

(iii) Cholecalciferol injections are administered to post menopausal osteoporotic women.

(iv) Renal failure is seen in patients with chronic Diabetes Mellitus.

(v) Some receptors cross talk to each other

(vi) The pancreas also has an exocrine function.

(b) An accident trauma victim suffering from acute haemorrhage is brought to a hospital. Unfortunately blood is not available for immediate transfusion The doctor in-charge advised a saline drip with reconstituted Albuminas an immediate life saving measure Explain the Rationale. 2

3 (a) Explain the biochemical basis for the following $15 \times 6 = 9$

(i) Myxedema in hypothyroidism

(ii) Bow legs in Rickets.

(iii) Hypo phosphatemia in hyper parathyroidism.

(iv) Polydepsia in Diabetes insipidus.

(v) –ve Nitrogen balance during chronic stress

(vi) Palpitations and cold feet during acute stress

(b) The Gastrointestinal tract can be considered a mini neuroendocrine system. Explain. 2

4 (a) Differentiate between the following

$1\frac{5}{2} \times 4 = 6$

(i) Pre and Post hepatic Jaundice.

(ii) Blood Brain Barrier and Blood Testis Barrier

(iii) $V_1$ & $V_2$ receptors for ADH.

(iv) NIDDM and IDDM

(b) Draw the Juxta glomerulus Apparatus What role do the cells of this apparatus play in regulating the Asterial blood pressure ? 3

(c) An old addage states that lactation in women can act as a temporary contraceptive Is there any scientific basis to such a statement Justify your answer 2

5 (a) Inner medullary osmolarity in the kidney is responsible for regulating urine volume Elaborate 3

(b) Developmentally and functionally the Pituitary gland could be considered a dual gland It can no longer be classified as a master gland Comment on these statements 3

(c) What is the basis for the automacity of the heart beat ? Correlate the conduction of a cardiac impulse with the cardiac cycle 3

(d) CAMP can also act as a transcriptional regulator 2

6 (a) Oxytocin response during Pasturition is an example of feed forward response What role does estrogen play in this cycle? 3

(b) Using Epinephrine as an example, explain how a hormone response is terminated. 2.5

(c) Growth hormone is now considered a trophic hormone and thyroxine can be called a prehormone Explain 2 5

(d) The mechanism of Xenobiotic Phenobarbital metabolism is the liver 3

7 (a) Explain $\Delta^5$ pathway for testosterone biosynthesis 3

(b) Insulin Receptor is an excellent example of divergence of different signalling pathways. Elaborate 3

(c) Explain the role of hormones in the changes observed in the endometrium during a menstrual cycle 3

(d) The placenta is called a feto maternal unit Explain. 2

8 (a) Briefly explain the following terms and their physiological relevance $1.5 \times 4 = 6$

(i) Signal Amplification

(ii) End Diastolic volume

(iii) LH surge

(iv) Sperm Capacitation

(b) What is the difference between Respiratory and Metabolic Acidosis ? What role does the kidney play in regulating blood pH ? 3

(c) Explain how Aspirin, EDTA and heparin act as anticoagulants ? Which of them cannot be used to clot blood in vitro ? Why ? 2