2025

(NEP—2020)

(4th Semester)

BIOCHEMISTRY (MAJOR/MINOR)

(Physiological Biochemistry)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. The antigens for ABO and Rh blood groups are present on the

(a) plasma ( ) *(b)* white blood cells ( )

(c) red blood cells ( ) *(d)* platelets ( )

2. Which among the following cells produces antibodies against a foreign antigen?

(a) Lymphocytes ( ) *(b)* Erythrocytes ( )

(c) Eosinophils ( ) *(d)* Platelets ( )

3. What is the difference between negative and positive feedback?

(a) In positive feedback, the output of the control system turns on a stimulus that had been switched off and negative feedback keeps a stimulus that has been turned on by positive feedback on ( )

(b) In positive feedback, the output of the control system reduces the original output stimulus and in negative feedback it increases the output stimulus ( )

(c) In negative feedback, the output of the control system reduces the original output stimulus and in positive feedback it shuts off the feedback temporarily ( )

(d) In negative feedback, the output of the control system reduces the original output stimulus and in positive feedback it increases the output stimulus ( )

4. Which of the following hormones increases sodium reabsorption in the kidney?

(a) Thyroxine ( ) *(b)* ADH ( )

(c) Atrial natriuretic hormone (*(d)*) Aldosterone ( )

5. The urine formed is expelled to the exterior by a process called

(a) diuresis ( ) *(b)* micturition ( )

(c) proteinuria ( ) *(d)* None of the above ( )

6. The most abundant cell type in the nervous system is

(a) sensory neuron ( ) *(b)* motor neuron ( )

(c) interneuron ( ) *(d)* Glial cell ( )

7. A brief interval of time during which nerve restimulation is not possible is called

(a) repolarization ( ) *(b)* depolarization ( )

(c) refractory period ( ) *(d)* hyperpolarization ( )

8. The cross-bridges of the sarcomere in skeletal muscle are made up of

(a) actin ( ) *(b)* myosin ( )

(c) troponin ( ) *(d)* tropomyosin ( )

9. All adrenal steroids originate from

(a) progesterone ( ) *(b)* calcitonin ( )

(c) cholesterol ( ) *(d)* parathyroid hormone ( )

10. The following are hormones of thyroid glands, except

(a) calcitonin ( ) *(b)* glucagon ( )

(c) T3 ( ) *(d)* thyroxine ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 15)

Write short notes on *five* of the following, taking at least *one* from each Unit : 3×5=15

UNIT—I

1. Blood cell types

2. Characteristics of homeostatic mechanisms

UNIT—II

3. Renal regulation of water balance

4. Hormonal regulation of electrolyte balance

UNIT—III

5. Sensory neurons

6. Smooth muscles

UNIT—IV

7. Biochemical functions of insulin

8. Biochemical functions of thyroid hormones

(SECTION : C—DESCRIPTIVE)

(*Marks* : 50)

Answer *five* questions, taking at least *one* from each Unit : 10×5=50

UNIT—I

1. What is blood? What are the components of blood? Explain in detail the blood clotting mechanism. 1+2+7=10

2. Write brief notes on the following : 5+5=10

(a) Transport of O_2 and CO_2 by hemoglobin

(b) Plasma proteins

UNIT—II

3. Discuss the structure and functions of kidney giving suitable diagram. 4+4+2=10

4. Write brief notes on the following : 5+5=10

(a) Glomerular filtration

(b) Acid-base balance

UNIT—III

5. What is synapse? Explain the mechanism of synaptic transmission with a neat-labelled diagram. 2+6+2=10

6. Write brief notes on the following : 5+5=10

(a) Sliding filament theory of muscle contraction

(b) Neurotransmitters

UNIT—IV

7. Define hormones. Explain the classification of hormones in detail. 2+8=10

8. Write brief notes on the following : 5+5=10

(a) Biochemical functions of estrogens

(b) Biochemical functions of catecholamines

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