3 Hours **Total Marks: 100**

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.

Q1. (a) Do as directed: (Any Six) **06**

1. What are globular proteins?
2. State true or false:
   4- hydroxyproline plays an essential role in the folding of collagen
3. Define protein motifs.
4. What is salting out of proteins?
5. Name the calcium binding protein of skeletal muscle.
6. Fill in the blank:
   The transition between T state to R state of hemoglobin is triggered by _____binding.
7. State true or false:
   Myoglobin is an oxygen storage protein
8. What is sarcomere?
9. Explain Bohr effect.

(b) Answer the following: (Any Two) **14**

1. Describe tertiary structure of α keratin
2. Explain chromatography techniques with reference to protein purification
3. Describe molecular chaperons assisted protein folding

Q2. a) Name the <u>Enzyme</u> catalyzing the following reactions: (Any Six) **06**

1. Sucrose 6 phosphate to sucrose
2. $Glycogen_n$ to glycogen $_{n+1}$
3. Squalene to squalene 2,3 epoxide
4. UDP –Glucose to Sucrose 6 phosphate
5. Geranyl pyrophosphate to farnesyl pyrophosphate
6. Glycogen synthase a to glycogen synthase b

7. Starch $_n$ to Starch $_{n+1}$
8. Mevalonate to 5-phosphomevalonate
9. Acetyl-CoA to AcetoacetylCoA

b) Give an account on the following: (Any Two) **14**

1. Peptidoglycan biosynthesis in bacteria
2. Steps involved in formation of squalene from isoprenes
3. Mechanism action of starch synthase on starch biosynthesis

Q3. (a) Do as Instructed: (Any Six) **06**

1. Name the hormone that controls the production of progesterone.
2. State true or false:
   Glucagon is secreted by α-cells of pancreas and opposes the action of insulin.
3. Name the hormone produced by human placenta.
4. Fill in the blank:
   _____ is associated with elevated TSH levels and an abnormal increase in the size of thyroid gland.
5. Give one function of PTH.
6. Mention the name of the proteins associated with the transport of thyroid hormones.
7. Give one function thyrotropin releasing hormone.
8. Name the hormone which induces contraction of uterus during labour pain.
9. Name the hormone associated with Cushing's syndrome.

(b) Answer the following: (Any Two) **14**

1. What are estrogens? Discuss on physiological and biochemical functions of estrogen.
2. Discuss on the biochemical functions of glucocorticoids.
3. Elaborate on the posterior pituitary hormone – ADH.

Q4. (a) Name the following: (Any Six) **06**

1. Functionally active form of Vitamin D
2. Provitamin A is _____.
3. Compound excreted in urine during deficiency of Thiamine.
4. The vitamin derived hormone that regulates calcium homeostasis.
5. The inorganic element found in the structure of majority of high-energy compounds
6. The principal cation of extracellular fluid.
7. Element present in thyroid hormone.
8. Deficiency of calories leads to.
9. Vitamin that is known as anti-pernicious anemia factor

(b) Answer the following questions (Any Two) **14**

1. Explain the role of Vitamin K in our body functions
2. Write briefly about significance of trace elements
3. What is Obesity? Explain its connection with adipose tissue.

Q5. Write short notes (Any Four) **20**

(a) Normal and sickle cell hemoglobin

(b) Atherosclerosis

(c) Role of glycogenin in glycogenesis

(d) Disorders associated with insulin.

(e) Five functions of Vitamin C

(f) Marasmus

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