

Time: 2½ Hours

Total Marks: 75

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

Q.1 Select the correct alternative: (Any Fifteen)

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- 1 An example of a protein with quaternary structure is:
 - a. Myoglobin
 - b. Haemoglobin
 - c. Lysozyme
 - d. Insulin (monomeric form)
- 2 Denaturation of proteins leads to:
 - a. Loss of biological activity
 - b. Increase in enzyme activity
 - c. Conversion to primary structure
 - d. Formation of new amino acids
- 3 Which metal ion is responsible for oxygen binding in haemoglobin and myoglobin?
 - a. Cu^{2+}
 - b. Mg^{2+}
 - c. Fe^{2+}
 - d. Zn^{2+}
- 4 The contractile proteins of muscle are:
 - a. Actin and collagen
 - b. Myosin and keratin
 - c. Actin and myosin
 - d. Myosin and tropomyosin
- 5 Affinity chromatography separates proteins based on:
 - a. Charge
 - b. Size
 - c. Specific binding interaction with a ligand
 - d. Solubility differences
- 6 The essential intermediates in the pathway from acetate to cholesterol are:
 - a. Acetic acid
 - b. Ethylene
 - c. Isoprene units
 - d. Methane

- 7 Which is the first intermediate in cholesterol synthesis?
- Mevalonate
 - Isoprene
 - Squalene
 - Ethylene
- 8 Which of the following are major sites for glycogen storage?
- Adipose tissue
 - Bones
 - Muscle and liver
 - Kidney and liver
- 9 Name the pathway for glucose synthesis by non-carbohydrate precursors.
- Glycogenesis
 - Glycolysis
 - Gluconeogenesis
 - Glycogenolysis
- 10 Which of the following is the major point of regulation on the pathway to cholesterol?
- Thiolase
 - HMG co-A synthase
 - HMG co-A reductase
 - Pyruvate kinase
- 11 Which hormone regulates basal metabolic rate?
- Thyroxine
 - Cortisol
 - Insulin
 - Aldosterone
- 12 The adrenal medulla secretes:
- Cortisol and Aldosterone
 - Epinephrine and Norepinephrine
 - Testosterone and Estrogen
 - Oxytocin and Vasopressin
- 13 HCG hormone is secreted by:
- Ovary
 - Pituitary gland
 - Placenta
 - Adrenal gland
- 14 Deficiency of iodine in diet causes:
- Diabetes mellitus
 - Goiter
 - Cretinism
 - Dwarfism

- 15 Which of the following hormones maintains pregnancy?
a. Estrogen
b. Progesterone
c. LH
d. FSH
- 16 Bananas are a good source of which mineral?
a. Potassium
b. Sodium
c. Zinc
d. Calcium
- 17 Fluoride in drinking water mainly helps in:
a. Building muscles
b. Preventing dental cavities
c. Improving digestion
d. Increasing blood sugar
- 18 Which of the following is a form of protein-energy malnutrition (PEM)?
a. Rickets
b. Kwashiorkor
c. Scurvy
d. Night blindness
- 19 Pellagra is caused by a deficiency of which vitamin?
a. Niacin (Vitamin B3)
b. Thiamine (Vitamin B1)
c. Riboflavin (Vitamin B2)
d. Folic acid
- 20 Which vitamin is most closely associated with maintaining good vision, particularly in low-light conditions?
a. Vitamin C
b. Vitamin A
c. Vitamin D
d. Vitamin E

Q2A) Describe molecular chaperones assisted protein folding. 8

Q2B) Explain protein purification by- 7
a) salting out
b) Dialysis

OR

Q2C) Discuss the oxygen binding to hemoglobin molecules. 8

Q2D) Elaborate on Quaternary structure of protein. 7

- Q3A) List major steps involved in cholesterol biosynthesis and explain rate limiting enzymes in cholesterol biosynthesis 8
- Q3B) Illustrate with diagram the stages of peptidoglycan biosynthesis in Gram negative bacteria 7
- OR**
- Q3C) Differentiate between starch and sucrose synthesis pathway with respect to location, enzyme and regulation. 8
- Q3D) Explain the biosynthesis and regulation of glycogen in animals. 7
- Q4A) Explain the physiological functions of insulin and glucagon in detail. 8
- Q4B) Discuss the role and importance of growth hormone. 7
- OR**
- Q4C) Explain the transport and mode of action of Group I hormones. 8
- Q4D) Explain the role of the adrenal medulla and its hormones. 7
- Q5A) Discuss the sources, functions and deficiency disorders of vitamin D. 8
- Q5B) Write a note on sources, functions and disorders associated with Folic acid (B9) and Iodine. 7
- OR**
- Q5C) Explain the nutritional importance of Vitamin C. 8
- Q5D) Write a detailed note on Vitamin E. 7
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