

NUTRITIONAL BIOCHEMISTRY

Questions carry two mark:

1. What do you mean by the terms food, nutrition and nutrients?
2. What do you mean by the balanced diet?
3. Write a method for the analysis of the following ingredients of food:
 - a) Crude protein
 - b) Crude fat
 - c) Digestible carbohydrate
 - d) Crude fibers.
4. What ingredients in food can be determined from the ash of food?

Questions carry four marks:

1. Explain the three food groups.
2. How is water content of the food material determined?
3. What are the steps to be followed in planning a balanced diet?
4. Mention the characters of a balanced diet.

DIGESTION

Questions carry two marks:

1. Write short notes on the accessory organs of the body.
 - a) Salivary glands
 - b) liver
 - c) pancreas
2. What are the functions of the following GIT organs?
 - a) Mouth and pharynx
 - b) esophagus
 - c) stomach
 - d) small and large intestine
3. Write short notes on the following
 - a) Metabolic port
 - b) nitrogen balance
 - c) lactose intolerance
 - d) Co-transportation
4. Give the composition and functions of saliva.
5. How does secretion of saliva takes place?
6. Give the composition of gastric juice.
7. Explain the functions of gastric juice.
8. Explain the mechanism of HCl secretion in the stomach.
9. What is the composition of pancreatic juice?
10. Explain the secretion of pancreatic juice.
11. Explain various functions involved in pancreatic juice.
12. What is the composition of intestinal juice?
13. What are the functions of intestinal juice?
14. How is digestion of nucleoprotein takes place in the intestine?
15. What is the digestive function of pepsin and rennin in the stomach?
16. Write short note on oxyntic glands

Questions carry four marks:

1. Describe the anatomy of human digestive system.
2. How are carbohydrates digested and absorbed?
3. Discuss the absorption and digestion of lipids.

4. Write short notes on the transport of lipids and proteins.
5. Discuss the absorption and digestion of proteins.
6. Explain the digestion that takes place in the intestine.
7. How does digestion of proteins starch and fats takes place in the
8. pancreatic digestion?
9. How is intestinal juice secreted and regulated?

ENERGY BALANCE

Questions carry two marks:

1. Define calorific value of food.
2. Define the following terms.
a) calorie b) kilocalorie
3. What is the significance of respiratory quotient?
4. What is meant by SDA? Give an example.
5. Discuss the energy requirement and diet for children.
6. Discuss in detail diet requirement for women during pregnancy state.
7. Explain the dietary requirement in case of lactating women.

Questions carry four marks:

1. Define calorific value. How calorific value of a fuel is measured using Bomb-calorimeter?
2. What is RQ? How do we calculate the calorific value Of carbohydrates and lipids?
3. What is meant by BMR? Explain the determination of BMR by using Benedict-Roth spirometer.
4. What are the factors that affect BMR? physical activities.
5. Explain the energy requirement and RDA for
a) Different physical activities.
b) Pregnant women.
c) Lactating mother.
d) Children upto 12 years.

MACRONUTRIENTS

Questions carry two marks:

1. What are macronutrients? Why are they called so?
2. Mention important storage forms of carbohydrates.
3. Explain the protein sparing action of carbohydrates and lipids.
4. What is dietary fiber? Mention the beneficial effects of dietary fibres.
5. Write four important dietary sources of lipids.
6. Explain the role of lipids as fuel molecules.
7. What are PUFA? Write their nutritional importance.
8. What are essential fatty acids? Why are they called so?
9. How do you say the protein is complete?
10. Explain the role of proteins in the diet.
11. Short notes on: • Nutritive value of proteins, • PER, • Biological value of proteins.
12. Write the clinical features of kwashiorkor.
13. What is marasmus? How is it identified?

14. What do you mean by fortification?
15. What are the advantages of fortification?
16. Explain how mutual supplementation improves the quality of proteins.

Questions carry four marks:

1. Give an account on protein requirement for different categories of people.
2. What is nitrogen balance? What is its importance?

MICRONUTRIENTS

Questions carry two marks:

1. Name the fat soluble vitamins.
2. Mention the provitamin A.
3. Why B-carotene gives 2 moles of vitamin A where as other carotenoids give only one molecule of vitamin A?
4. What is Rhodopsin?
5. State the deficiency manifestations of vitamin A.
6. Mention the different types of vitamin D.
7. Why vitamin D₃ is called prohormone?
8. What are the deficiency manifestations of vitamin D? Explain.
9. State the biochemical functions of vitamin E.
10. What are the deficiency manifestations of vitamin E?
11. What are the biochemical functions of vitamin K?
12. How is vitamin K deficiency produced?
13. Why is a new born baby more prone to develop vitamin K deficiency and hypoprothrombinaemia?
14. How to prevent the development of vitamin K deficiency in a new born baby?
15. State the sources and daily requirements of fat soluble vitamins.
16. Name the sulphur containing vitamins.
17. Explain the deficiency manifestations of thiamine.
18. What is the relation of Vitamin B₂ intake with diet?
19. What are the biological active forms of riboflavin?
20. Explain the co enzyme role of niacin.
21. Name one fat soluble vitamin and one water soluble vitamin synthesized in the body.
22. What is this deficiency disease produced by Niacin?
23. Why is Pellagra more common in Maize eaters?
24. What are the different forms of Vitamin B₆?
25. State the coenzyme role of PLP.
26. Explain the metabolic role of pantothenic acid
27. Explain the coenzyme role of Biotin.
28. What is folic acid? What is its active form?
29. What is Vitamin B₁₂? What is its chemical name?
30. Why are people strictly on vegetarian diet more prone to develop B₁₂ deficiency ?
31. Write the chemical name and structure of Vitamin C.
32. Why is vitamin C not synthesized in humans?
33. State the importance roles of Vitamin C.
34. What are the sources of Vitamin C?
35. State the clinical manifestations of scurvy.
36. Define Macro and trace elements
37. Write about the deficiency diseases associated with Calcium and Phosphorous.

38. Give an account of sources and requirement of Magnesium.

Questions carry four marks:

1. What are vitamins? How will you classify them?
2. State the functions of vitamin D.
3. What is hypervitaminosis? Explain with respect to fat soluble vitamins.
4. Explain the absorption and transportation of fat soluble vitamins.
5. List the water soluble vitamin B-complex group.
6. What is TTP? Write two reactions where it acts as a co enzyme.
7. State the sources and daily requirements of B complex group of vitamins.
8. Explain the coenzyme role of water soluble vitamins.
9. Write the biochemical importance of Calcium and Phosphorous.
10. Give an account of biological importance of sodium, potassium and chlorine.
11. Write an account of sources, requirement and deficiency diseases of iron, cobalt and fluoride.

CELLS AND TISSUES

Questions carry two marks:

1. Write a brief note on cell-cell junctions.
2. List the various levels of cellular organization.
3. Describe the structure of epithelial tissue.
4. What are the functions of epithelial tissues?
5. Write a note on the shape of epithelial cells.
6. What is meant by simple and stratified epithelia? Give examples.
7. What is a connective tissue? Give its broad functions.
8. How are connective tissues classified?
9. What is a loose connective tissue? Give example.
10. What is a dense connective tissue? Give example.
11. Write a note on cartilage.
12. Write briefly on functions of bone
13. What is the composition of bone?
14. Write a short note on bone remodeling.
15. List the hormones important in bone physiology.

Questions carry four marks:

1. What are prokaryotes? Explain with a neat diagram.
2. Write an account on eukaryotic cell structure.
3. Compare the animal and plant cells.
4. Name the cell organelles found in animal cells. Write a brief note on their functions.
5. Give the structure of mitochondria. Give its functions
6. Write a short note on microtubules
7. Prepare a list of organ system and their functions
8. Describe the structure of bone with a neat labeled diagram.

BODY FLUIDS

Questions carry two marks

1. What are the different compartments in which water is distributed?
2. Give the composition of human blood.
3. Which are the different cellular components of blood?

4. Give the composition of blood plasma.
5. What are the functions of erythrocytes?
6. What are the characteristics of lymphatic fluid?
7. Give the characteristics of cerebrospinal fluid.
8. What is fibrinolysis? What is its function in the body?
9. What is the role played by hemoglobin of RBC in gas transport?
10. Explain the dependence of oxygen affinity on hemoglobin
11. What is blood-brain barrier? Give its importance.

Questions carry four marks:

1. What are plasma proteins? What are their functions?
2. Describe the process of coagulation.
3. Draw the oxygen disassociation curve of hemoglobin. What is the information obtained from it?
4. Draw the oxygen disassociation curve of myoglobin. What is the information obtained from it?
5. Mention the three methods by which carbon dioxide is transported from tissues to lungs.
6. Describe the transportation of carbon dioxide from tissues to capillaries
7. Describe the transportation of carbon dioxide from tissues to lungs.

LIVER

Questions carry two marks:

1. Write short notes on
 - a) Bile
 - b) Hepatic lobule
 - c) Liver function test
2. What are the limitations of liver function test?

Questions carry four marks:

1. With the help of neat labeled diagram, explain the structure of liver.
2. Discuss the different types of liver function test.
3. What are the functions of liver?

KIDNEY

Questions carry two marks:

1. Give the composition of urine.
2. Write short notes on:
 - a) DCT
 - b) Bowman's capsule
 - c) Renal failure
 - d) Formation of urine glomerular filtration
 - e) Loop of Henle
3. Write a note on:
 - a) Haemodialysis
 - b) Peritoneal dialysis

Questions carry four marks:

1. Describe the general structure of kidney.
2. With the help of neat labeled diagram discuss the structure of nephron.
3. Explain dialysis in detail.

ACID BASE BALANCE

Questions carry two marks:

1. Maintenance of pH in body is crucial to the body. Explain.
2. Which are body sources of acids?
3. Give sources of bases in body.
4. Make a list of buffer systems found in plasma and blood cells.
5. Blood pH is maintained at 7.4 constantly .How?

Questions carry four marks:

1. List the general mechanisms for acid -base balance.
2. How do proteins behave as buffers in body?
3. What is the role of lungs in maintenance of acid-base balance?
4. Bicarbonate/CO₂ buffer is an important buffer for body. Explain.
5. Briefly write on the role of kidney in acid-base balance.
6. Explain the role of phosphate buffer in the body.

ENDOCRINE SYSTEM

Questions carry two marks:

1. What are endocrine and exocrine glands? Give examples for each.
2. What is a hormone? Give the examples.
3. Classify the hormones by their structure.
4. Give the functions of endocrine system.
5. Give two examples for peptide hormones.
6. Give two examples for steroid hormones.
7. List the hormones derived from tyrosine.
8. How do hormones function?
9. Hormones alter the gene expression. Explain
10. Give the functions of hormones of posterior pituitary.
11. List the hormones of adrenal medulla. What are the functions in the body?
12. Give the function of hormones produces by parathyroid glands.
13. Which are the endocrine hormones produced by pancreas? What is their function?
14. List of functions of hormones of ovary?
15. List the functions of hormones of testes.
16. What is placenta? List important hormones of placenta and their functions?
17. Which hormones are elaborated by kidneys? Give their functions?

Questions carry four marks:

1. Give the mechanism of action of polypeptide hormone.
2. Give the mechanism of action of steroid hormones.
3. Explain the second messenger concept.
4. List the hormones elaborated by anterior pituitary .Give functions each.

5. Give the functions of hormones secreted by adrenal cortex? What are their functions in the body?
6. List three hormones of thyroid glands. What are their functions?
7. Prepare a list of endocrine hormones with their functions.

NERVOUS SYSTEM

Questions carry two marks:

1. Give an account of neuron classification based on their location.
2. What is meant by resting potential?
3. What is an action potential?
4. Give the characteristics of nerve impulse.
5. Describe the role of myelin sheath in impulse transmission.
6. What is a synapse?
7. What are neurotransmitters?
8. What are excitatory and inhibitory neurotransmitters? Give examples for each.
9. Give the Nernst equation. What is its significance?
10. What is Goldman equation? What is it used for?

Questions carry four marks:

1. Briefly describe the general structure of neuron.
2. Explain the structural features of neurons with a neat diagram.
3. Give the structural classification of neurons.
4. Give the mechanism of impulse transmission.
5. Describe the events occurring at the synaptic cleft.
6. What is the mechanism of action of neurotransmitters?

MUSCLE

Questions carry two marks:

1. What are the protein – components in muscles?
2. How is muscle contraction controlled?

Questions carry four marks:

1. Give essential features of skeletal muscle tissue.
2. Write a note on smooth muscles.
3. Describe the mechanism of muscle contraction.
4. Explain the muscle structure with a neat diagram.
5. What is a sarcomere? Describe its structure.
6. Give the structure and function of actin and myosin.
7. Explain the sliding filament theory for muscle contraction.
8. What are the characteristics of cardiac muscle?