NEET PG 2025

Biochemistry Previous Year Questions with Solutions

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Biochemistry

Question 1

Clinical question

A labourer was stuck in a tunnel for 5 days without food. Which of the following processes serves as the primary source of energy for the brain during this time?

Options:

A) Glycogenolysis
B) Gluconeogenesis
C) Ketogenesis
D) Lipolysis

Correct answer: C) Ketogenesis

Question 2

Clinical question

Under an experimental condition, blood glucose level is spiked to 2-3 times the normal level and is sustained at this level. Which of the following describes the pattern of insulin levels in the blood?

Options:

A) Sudden rise in insulin followed by a slower, sustained drop in insulin
B) Continuous increase in insulin until a maximum concentration
C) Increase in insulin followed by a decrease below the baseline level
D) Sudden initial increase followed by a delayed but higher and continuing increase in insulin levels

Correct answer: D) Sudden initial increase followed by a delayed but higher and continuing increase in insulin levels

Question 3

Non-clinical question

A patient presents with ataxia, anaemia, and sensory neuropathy. Laboratory tests show elevated

total homocysteine and methylmalonic acid levels. Production of which of the following amino acids could be affected?

Options:

A) Tyrosine
B) Glutamine
C) Cysteine
D) Methionine

Correct answer: D) Methionine

Question 4

Clinical question

A patient on long-term hydrochlorothiazide presents with features of heart failure, horizontal nystagmus, and peripheral neuropathy. There is no history of alcohol use or smoking. Which of the following deficiencies can cause this presentation?

Options:

A) Thiamine
B) Selenium
C) Zinc
D) Vitamin B12

Correct answer: A) Thiamine

Question 5

Clinical question

A 10-year-old boy presents with coarse facial features, organomegaly, corneal opacity, and peripheral neuropathy. A deficiency of the enzyme alpha-L-iduronidase is found. Which of the following is accumulated in this condition?

Options:

A) Dermatan sulfate and heparan sulfate
B) Dermatan sulfate
C) Keratan sulfate and chondroitin sulfate
D) Sphingolipids

Correct answer: A) Dermatan sulfate and heparan sulfate

Question 6

Clinical question

A 10-year-old presents with multiple freckles and hyperpigmentation that worsens with sun exposure. Examination reveals two basal cell carcinomas on the face. Which of the following DNA repair mechanisms is defective?

Options:

A) Base excision repair
B) Nucleotide excision repair
C) DNA mismatch repair
D) DNA double-strand break repair

Correct answer: B) Nucleotide excision repair

Question 7

Clinical question

A 10-month-old boy presents with recurrent oral lesions and respiratory infections. Laboratory investigations reveal reduced B cell, T cell, and NK cell counts along with reduced adenosine deaminase levels. Which of the following is the most likely diagnosis?

Options:
A) Agammaglobulinemia
B) Alpha-1 antitrypsin deficiency
C) DiGeorge syndrome
D) Severe combined immunodeficiency

Correct answer: D) Severe combined immunodeficiency

Question 8

Non-clinical question

Which of the following molecular diagnostic tests is useful in syndromic conditions like meningitis?

Options:

A) Uniplex PCR
B) Multiplex PCR
C) Nested PCR
D) Arbitrarily primed PCR

Correct answer: B) Multiplex PCR

Question 9

Non-clinical question

A frameshift mutation was introduced into the coding sequence of an mRNA. If this occurs at the 4th position in an mRNA with 900 nucleotides, which of the following is most likely to happen?

Options:

A) No biological change
B) Partial loss of protein and function
C) Complete loss of protein and function
D) No change in function as it will be removed in post-translational modification

Correct answer: C) Complete loss of protein and function

Question 10

Clinical question

A 40-year-old woman who underwent ileal resection presents with features of anaemia despite a balanced diet. Her RBC count is 2.8 million/mm^3, and serum iron is 164 mcg/dL. Which of the following is most likely to be found in her?

Options:

A) Iron deficiency anaemia
B) Megaloblastic anaemia
C) Aplastic anaemia
D) Hemolytic anaemia

Correct answer: Megaloblastic anaemia

Question 11

Non-clinical question

Which of the following, if given in large volumes, can lead to hyperchloremic metabolic acidosis?

Options:

A) Dextrose in NS (DNS)
B) Normal saline
C) 5% dextrose in water
D) Ringer's lactate

Correct answer: B) Normal saline

Question 12

Clinical question

A patient presents with bleeding symptoms and factor 9 deficiency that resolve after administration of a vitamin K injection. Which of the following is the most likely underlying condition?

Options:

A) Classical haemophilia
B) Biliary obstruction
C) Pernicious anaemia
D) Hepatitis A

Correct answer: B) Biliary obstruction

Question 13

Clinical question

A child presents with elevated concentrations of phenylalanine. Phenylalanine hydroxylase activity is found to be normal. Which of the following coenzymes, also required for tyrosine metabolism, could be deficient in this child?

Options:

A) Biopterin
B) Pyridoxal phosphate
C) Adenosylcobalamin

D) Dihydrofolic acid

Correct answer: A) Biopterin

Question 14

Clinical question:

An 8-year-old boy presents to the OPD for evaluation of a subcutaneous xanthoma on his right elbow. His father recently died of a myocardial infarction, and there is a family history of similar findings. Laboratory investigations reveal total cholesterol of 480 mg/dL, triglycerides of 146 mg/dL, and LDL cholesterol of 300 mg/dL. Which of the following types of
Familial hyperlipoproteinemias is the most likely underlying condition?

Options:

A) Type I
B) Type IIa
C) Type IIb
D) Type III

Correct answer: B) Type IIb

Question 15

Clinical Question:

A 70-year-old man presents with a fracture following trivial trauma. He also has perifollicular haemorrhages, lusterless hair, and dry skin. He is on an exclusive diet of toast and buns and has microcytic hypochromic anaemia. Which of the following enzymes is most likely affected in this patient?

Options:

A) Prolyl hydroxylase
B) ALA synthase
C) Glutathione peroxidase
D) Dihydrofolate reductase

Correct answer: A) Prolyl hydroxylase

Question 16

Clinical question:

A 7-month-old infant presents with developmental delay, seizures, and a cherry-red spot on fundoscopy. The mother has a history of an abortion at 8 weeks. Genetic testing reveals a deficiency of hexosaminidase A. Which of the following accumulates in this condition?

Options:

A) GM1 ganglioside
B) GM2 ganglioside
C) Galactocerebroside
D) Sphingolipids

Correct answer: B) GM2 ganglioside

Question 17

Clinical question:

A boy presents with orange-colored tonsils and a family history of multiple cardiovascular-related deaths. Laboratory investigations show total cholesterol of 80 mg/dL, triglycerides 146 mg/dL, HDL <5 mg/dL, and LDL 90 mg/dL. Which of the following is the most likely diagnosis?

Options:

A) Niemann-Pick disease type C
B) Tangier disease
C) Familial abetalipoproteinemia
D) Familial hyperlipoproteinemia type I

Correct answer: B) Tangier disease