Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

D. Pharm Second year- University Examination, May 2024

BIOCHEMISTRY and CLINICAL PATHOLOGY [PBT-ER20-23T-S1]

Marks: 80   **Duration: 180 mins.**

MCQs

Answer all the questions.   Section Duration: 30 mins

20 Q x 1 mark = 20 marks

1)   Which of the following is known as power house of the cell?   (1)

   Lysosomes
   Mitochondria
   Ribosomes
   Nucleus

2)   Which of the following is a homopolysaccharide?   (1)

   Sucrose
   Glycosaminoglycans
   Ribose
   Starch

3)   Which of the following amino acids contain amide side chain among all the naturally occurring   (1)
           amino acids?

   Aspartate
   Tyrosine
   Methionine
   Asparagine

4)   Which of the following amino acids is acidic in nature?   (1)

   Valine
   Proline
   Lysine
   Glutamate

5)   Which of the following is true for **fats**?   (1)

   Have lower melting point than oils
   Have a higher iodine number than oils
   Have a higher proportion of saturated fatty acids than oils
   Fats liquefy at room temperature

6)   Which of the following is **not** a type of RNA?   (1)

   tRNA

  siRNA
  miRNA
  fRNA

7)   Which of the following is a water-soluble vitamin?   (1)

  Vitamin E
  Vitamin D
  Vitamin K
  Vitamin B

8)   Which of the following mineral prevents softening of bones?   (1)

  Calcium
  Iron
  Phosphorous
  Sodium

9)   Which of the following enzymes cause intra-molecular rearrangement?   (1)

  Hydrolases
  Isomerases
  Transferases
  Lyases

10)   Which type of Jaundice gives a direct positive reaction with Van den Berg reaction?   (1)

  Cerebral
  Hemolytic
  Hepatic
  Obstructive

11)   Which formula is used to determine standard urea clearance to assess kidney function?   (1)
Where, U= Urea concentration in urine (mg/ml); V= Urine excreted per minute in ml; P= Urea concentration in plasma (mg/ml), and Cm = Maximum urea clearance.

$Cs = U \times \sqrt{V/P}$
$Cs = V \times \sqrt{U/P}$
$Cs = U \times \sqrt{P/V}$
$Cs = V \times \sqrt{P/U}$

12)   Who invented the rabies vaccine?   (1)

Edward Jenner
Alexander Fleming
Robert Koch
Louis Pasteur

13)   Which component of blood plays a crucial role in preventing blood loss by initiating the clotting process?   (1)

Red blood cells
  Platelets
White Blood Corpuscles
Lymphocytes

14)   What factors typically alter plasma osmolality?   (1)

  Calcium
  Iron
  Sodium

Magnesium

15) Where does glycolysis occur in eukaryotic cells? (1)

Cytoplasm
Mitochondria
Endoplasmic reticulum
Nucleus

16) How many carbons are removed during each round of beta-oxidation of fatty acids? (1)

1 carbon
2 carbons
3 carbons
4 carbons

17) What is the primary function of the urea cycle? (1)

Synthesis of amino acids
Breakdown of amino acids
Detoxification of ammonia
Synthesis of glucose

18) Which of the following enzymes causes Phenylketonuria (PKU)? (1)

Arginosuccinate synthase
Arginase
Homogentisate oxidase
Phenylalanine hydroxylase

19) What is the primary treatment approach for individuals with Hartnup disease? (1)

Dietary supplementation with tryptophan
Corticosteroid therapy
Anticoagulant medications
Liver transplantation

20) What is the primary pigment responsible for the yellow discoloration seen in jaundice? (1)

Melanin
Bilirubin
Hemoglobin
Chlorophyll

Long Answers

Answer all the questions.

6 Q x 5 marks = 30 marks

1) Explain the classification of amino acids based on R group. (5)
2) Explain the chemical properties of fats. (5)
3) Write about the food sources, physiological functions and deficiency diseases of vitamin A. (5)
4) Explain the functions of blood and types of anaemia. (5)
5) Write a note on Glycolysis pathway. (5)
6) Explain steps involved in beta-oxidation of fatty acids. (5)

Short Answers

Answer all the questions.

10 Q x 3 mark = 30 marks

1)	Explain the classification of carbohydrates with suitable examples.	(3)
2)	Mention any three differences between DNA and RNA.	(3)
3)	Mention the food sources, function and deficiency of Iron.	(3)
4)	Explain the water turnover and water balance in humans.	(3)
5)	Explain the Van der Berg test to assess the liver function.	(3)
6)	Explain the lock and key model of enzyme action.	(3)
7)	Write a note on steps involved in ketogenesis.	(3)
8)	Define β-oxidation. Draw the carnitine shuttle system associated with the β-oxidation of fatty acid.	(3)
9)	Write a note on urea cycle.	(3)
10)	What is black urine disease?	(3)

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