

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Time : 3:00 Hours]

[Maximum Marks : 80

NOTES:

- i) Attempt all parts.
- ii) Students are advised to specially check the Numerical Data of question paper in both versions. If there is any difference in Hindi Translation of any question, the students should answer the question according to the English version.
- iii) Use of Pager and Mobile Phone by the students is not allowed.

PART - A

(Long Questions)

Attempt any six questions. Each question carries equal marks.

[6 × 5 = 30]

- Q1) Define carbohydrates. Classify carbohydrates with examples.
- Q2) What are proteins? Classify proteins with suitable examples.
- Q3) What are triglycerides? Give properties of triglycerides.
- Q4) What is DNA? Describe structure of DNA (Watson and Crick model).
- Q5) What are enzymes? Discuss the different factors affecting enzymatic actions.
- Q6) Describe Krebs cycle.
- Q7) Write in short the various tests to assess the functions of liver.

PART - B

(Short Questions)

Attempt any ten questions. Each question carries equal marks.

[10 × 3 = 30]

- Q1) Why is the mitochondria called the powerhouse of the cell?
- Q2) Write a note on qualitative tests for carbohydrates.
- Q3) Write about diseases related to malnutrition of proteins.
- Q4) Give therapeutic and pharmaceutical importance of enzymes.
- Q5) Give the functions and deficiency disorder of cyanocobalamin.
- Q6) Write a note on urea cycle.
- Q7) What are Ketone bodies? Write a note on Ketogenesis.
- Q8) Define and classify minerals with suitable examples.

Q9) Write a note on oral rehydration therapy✓

Q10) What is blood? Write functions of blood✓

Q11) How sugar is detected in urine?✓

PART-C

(Objective Type Questions)

Answer all questions. Each question carries equal marks.

120 × 1 = 2

Q1) Which of the following monosaccharide is not an aldohexose?

- | | |
|--------------|------------|
| a) fructose | b) glucose |
| c) galactose | d) mannose |

Q2) Which of the following amino acids is not an essential amino acid:

- | | |
|---------------|------------|
| a) valine | b) leucine |
| c) histidine✓ | d) glycine |

Q3) Cholesterol is a

- | | |
|-----------------|----------------|
| a) Phospholipid | b) Steroid✓ |
| c) Fatty acids | d) Glycolipid✓ |

Q4) The major component of biological membrane is.

- | | |
|-----------------|----------------|
| a) steroid | b) fatty acid✓ |
| c) phospholipid | d) glycolipid |

Q5) _____ are the major purine bases found in the nucleic acids.

- | | |
|-------------------------|------------|
| a) Adenine | b) Guanine |
| c) Adenine and guanine✓ | d) Thymine |

Q6) Enzymes that split the molecules with water.

- | | |
|--------------|----------------|
| a) Lipase | b) Hydrolases✓ |
| c) Isomerase | d) None |

Q7) Coenzymes are organic but _____ molecules.

- | | |
|------------------|------------|
| a) Nonprotein | b) Protein |
| c) Both A and B✓ | d) None |

Q8) The process of blood clotting is initiated by

- a) fibrinogen ✓
 b) thrombin ✗
 c) prothrombin
 d) thromboplastin ✗

Q9) Beriberi is caused by the deficiency of _____

- a) riboflavin
 b) niacin ✓
 c) folic acid
 d) thiamine

Q10) Phosphoglyceraldehyde is an important intermediate stage in the breakdown of

- a) carotene
 b) starch
 c) glucose ✓
 d) haemoglobin

Q11) Glycogenesis is the synthesis of _____

- a) glucose
 b) glycogen ✓
 c) glyceral
 d) starch ✓

Q12) β -oxidation is the breakdown of

- a) polypeptides
 b) longchain fattyacids ✓
 c) aminoacids and sugar
 d) polysaccharides

Q13) Which of the following element is required for constriction of muscles.

- a) Ca^{++}
 b) Na^+
 c) Mg^{++}
 d) Mn^{++} ✓

Q14) Goitre is caused by the deficiency of

- a) chloride
 b) fluorine
 c) iodine ✓
 d) sulphide ✓

Q15) An adult human contains about _____ of water.

(60% / 80%)

Q16) Vaccine is the product of _____

(biotechnology/biological science) ✓

Q17) High density lipoprotein cholesterol (HDL cholesterol) is a _____ cholesterol ✗

(good/bad) ✓

Q18) Urea is the end product of _____ metabolism.

(Carbohydrate/protein) ✓

Q19) _____ is a condition where blood appears in the urine.

(Haematuria/Pyuria) ✓

Q20) _____ is a hereditary disease, also known as bleeding disease.

(Haemophilia/Purpura) ✓

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Code No. : 2608

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PART-A

[6 × 5 = 30]

Answer any six questions. Each question carries equal marks.

- Q1) Write a brief note on scope of biochemistry in pharmacy.
- Q2) Write the structure and functions of mitochondria.
- Q3) Give the classification of amino acids based on chemical nature with suitable examples.
- Q4) Discuss the applications of biotechnology in medicine & vaccine development.
- Q5) Discuss the functions of calcium, sodium, iron and zinc in our body.
- Q6) Discuss the mechanism of action of enzymes.
- Q7) Write in brief about biological oxidation and obesity.

PART-B

[10 × 3 = 30]

Answer any ten questions. Each question carries equal marks.

- Q1) Discuss in brief about abnormal constituents of urine.
- Q2) Write the Molisch's test.
- Q3) Define clearance. Give note on creatinine clearance.
- Q4) Write the biological role of fatty acid.
- Q5) Describe the functions of the following electrolytes-phosphorus and chloride.
- Q6) Discuss the disease related to malnutrition of proteins.
- Q7) Discuss the components of nucleic acids.
- Q8) Discuss the absorption & excretion of iron.
- Q9) List the various enzymes used for diagnostic purpose.
- Q10) Write the causes, symptoms and treatment of dehydration.
- Q11) Write a short note on vitamin C.

PART-C

[20 × 1 = 20]

Answer all questions. Each question carries equal marks.

(Multiple Choice Questions / Fill in the blanks / one word or one sentence questions)

- Q1) Which one is the heaviest particulate component of the cell?
- Q2) Explain the term polycythemia.
- Q3) Mention the functional unit of kidney.
- Q4) Bile is secreted by which organ?
- Q5) Yellow biotechnology deals with _____.
- Q6) General formula of Polysaccharide is _____.
- Q7) Mention the name of carbohydrate deficiency disease.
- Q8) All the following are important electrolytes in the body except :
 - a) Potassium ions
 - b) Carbon ions
 - c) Chloride ions
 - d) Sodium ions
- Q9) Give biochemical role of sodium.
- Q10) Write deficiency symptoms of vitamin D.
- Q11) Glycogenesis takes place in :
 - a) Cytosol
 - b) Mitochondria
 - c) Ribosomes
 - d) Endoplasmic reticulum
- Q12) Iodine value is related to which of the following?
 - a) Fats and oils
 - b) Alcohols
 - c) Esters
 - d) Hydrocarbons

F - 4978

(P.T.O.)

- Q13) When the rate of synthesis of ketone bodies is more than its utilization, it leads to :
 a) Colour blindness
 b) Diabetes
 c) Anaemia
 d) Ketonemia
- Q14) Write the two functions of RNA.
- Q15) Define enzyme inhibition.
- Q16) Define the term Pathology.
- Q17) Mention the name of two fat soluble vitamins.
- Q18) Mention the therapeutic application of Streptokinase and Urokinase.
- Q19) The attachment between the base and sugar in a nucleotide is through which bond.
- Q20) Deficiency of _____ causes a disease known as beriberi.

(हिन्दी अनुवाद)

नोट : सभी खण्डों को हल कीजिए ।

खण्ड - (अ)

[6 × 5 = 30]

किन्हीं छः प्रश्नों के उत्तर दीजिए । प्रत्येक प्रश्न के अंक समान हैं।

- प्र.1) फार्मसी में बायोकेमिस्ट्री के कार्यक्षेत्र (scope) पर संक्षेप में एक टिप्पणी लिखिए ।
- प्र.2) माइटोकॉन्ड्रिया की संरचना एवं कार्यों को लिखिए ।
- प्र.3) उपयुक्त उदाहरण देते हुए रसायनिक प्रकृति के आधार पर अमीनो एसिड का वर्गीकरण कीजिए ।
- प्र.4) ओषधि और टीका विकास में जैव प्रौद्योगिकी के अनुप्रयोगों पर चर्चा कीजिए ।
- प्र.5) हमारे शरीर में कैल्शियम, सोडियम, लोहा एवं जिंक के कार्यों पर चर्चा कीजिए ।
- प्र.6) इन्जाइम्स के कार्य की क्रिया विधि पर चर्चा कीजिए ।
- प्र.7) जैविक आक्सीकरण एवं मोटापा के बारे में संक्षेप में लिखिए ।

खण्ड - (ब)

[10 × 3 = 30]

किन्हीं दस प्रश्नों के उत्तर दीजिए । प्रत्येक प्रश्न के अंक समान हैं।

- प्र.1) मूत्र के असामान्य घटकों के बारे में संक्षेप में चर्चा कीजिए ।
- प्र.2) मोल्टिच परिक्षण को लिखिए ।
- प्र.3) क्लीयरेंस को परिभाषित कीजिए । क्रिएटिनिन क्लीयरेंस पर टिप्पणी दीजिए ।
- प्र.4) फेटी एसिड की जैविक भूमिका लिखिए ।
- प्र.5) निम्नलिखित इन्फेक्टोलाइड्स के कार्य का वर्णन करें : लिप्सोसोम तथा क्लोफ़ेड
- प्र.6) प्रोटीन के कुपोषण से संबंधित रोग पर चर्चा कीजिए ।
- प्र.7) न्यूक्लियोटाइड्स के घटकों पर चर्चा कीजिए ।
- प्र.8) लोहे के अवशोषण और उत्सर्जन पर चर्चा कीजिए ।
- प्र.9) वैद्यनिक उद्देश्य के लिए उपयोग किये जाने वाले विभिन्न एन्जाइमों की सूची बनाइए ।
- प्र.10) निर्जलीकरण के कारण, लक्षण और उपचार लिखिए ।
- प्र.11) विटामिन C पर संक्षिप्त टिप्पणी लिखिए ।

खण्ड - (ग)

[20 × 1 = 20]

सभी प्रश्नों के उत्तर दीजिए । प्रत्येक प्रश्न के अंक समान हैं।

(बहुविकल्पीय प्रश्न/रिक्त स्थानों की पूर्ति/एक शब्द अथवा एक वाक्य के प्रश्न)

- प्र.1) कोशिका का सबसे भारी कणीय घटक कौन सा है ?
- प्र.2) पालीमिथेमिया शब्द की व्याख्या कीजिए ।
- प्र.3) श्वेत की क्रियात्मक इकाई का उल्लेख कीजिए ।
- प्र.4) पित्त किस अंग द्वारा स्रावित होता है ?
- प्र.5) येलो बायोटेक्नोलॉजी से संबंधित है ?
- प्र.6) पोली मेके राइड का सामान्य मूत्र है ।
- प्र.7) कार्बोहाइड्रेट की कमी से होने वाले रोग का नाम लिखिए ।

प्र.8) निम्नलिखित सभी शरीर में महत्वपूर्ण इलेक्ट्रोलाइट्स हैं सिवाय :

अ) पोटेशियम आयन

ब) कार्बन आयन

स) क्लोराइड आयन

द) सोडियम आयन

प्र.9) सोडियम की जैव रसायनिक भूमिका दीजिए ।

प्र.10) विटामिन डी की कमी के लक्षण लिखिए ।

प्र.11) ग्लाइकोजेनेसिस में होता है :

अ) साइटोसोल

ब) माइटोकॉन्ड्रिया

स) राइबोसोम

द) इंडोप्लाज्मिक रेटिकुलम

प्र.12) निम्नलिखित में से कौन आरबीडीन वैल्यू से संबंधित है?

अ) वसा और तेल

ब) एल्कोहल

स) एस्टर

द) हाइड्रोकार्बन

प्र.13) जब कीटोन निकायों के संश्लेषण की दर इसके उपयोग से अधिक होती है, तो यह होता है :

अ) रंग अंधापन

ब) मधुमेह

स) एनीमिया

द) केटोनीमिया

प्र.14) RNA के दो कार्य लिखिए ।

प्र.15) एन्जाइम संदमन को परिभाषित कीजिए ।

प्र.16) पैथोलॉजी शब्द को परिभाषित कीजिए ।

प्र.17) वसा में घुलनशील दो विटामिनों के नाम लिखिए ।

प्र.18) स्ट्रेप्टोकिनेज और यूरोकाइनेज के चिकित्सीय अनुप्रयोग का उल्लेख कीजिए ।

प्र.19) एक न्यूक्लियोटाइड में शर्करा और चीनी के बीच लगाव किस बाण्ड के माध्यम से होता है ।

प्र.20) की कमी से बेरी-बेरी नामक रोग होता है ।

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Part - A**Note :** Answer any six questions. Each question carries equal marks.

[6x5=30]

- Q.1. Define Carbohydrates and discuss its classification with example.
 Q.2. Write down the definition and classification of Amino-acids with example.
 Q.3. Discuss type, functions, recommended daily requirements of Minerals along with the diseases caused by their deficiency
 Q.4. Discuss Electrolyte composition of the body Fluids. Write a note on dietary intake of electrolytes and Electrolyte balance.
 Q.5. Discuss the role of Lymphocytes and Platelets in health and disease.
 Q.6. Discuss functions of Kidney and Routinely performed test to assess the functions of Kidney and their clinical significance.
 Q.7. Define Purine and Pyrimidine bases. Draw the structure of DNA and discuss its functions.

Part - B**Note :** Answer any ten questions. Each question carries equal marks.

[10x3=30]

- Q.1. Write short note on Biotechnology.
 Q.2. Write short note on Cell and its Biochemical organisation.
 Q.3. Define erythrocytes and its significance.
 Q.4. Define Co-enzymes and its functions.
 Q.5. Functions of Cholesterol in the body.
 Q.6. Discuss diseases related to Malnutrition of Protein.
 Q.7. Write short note on Oral Rehydration Therapy.
 Q.8. Write short note on Urea cycle.
 Q.9. Discuss Enzymes in short.
 Q.10. Abnormal constituents of Urine and their significance.
 Q.11. Write short note on Protein Deficiency diseases.

Part - C**Note :** Multiple Choice Questions/Fill in the blanks. Answer all questions. Each question carries equal marks.

[20x1=20]

Q.1. Common table sugar is :

- (a) Sucrose
 (c) Glucose

- (b) Lactose
 (d) Fructose

- Q.2. Glycogen in animals are stored in :
 (a) Liver and Bile (b) Liver and Spleen
 (c) Liver and Adipose tissue (d) Liver and Muscles
- Q.3. How many amino acids made up a protein ?
 (a) 20 (b) 10
 (c) 30 (d) 50
- Q.4. On hydrolysis protein give :
 (a) Alcohol (b) Fatty acid
 (c) Amino acid (d) Carboxylic acid
- Q.5. In which solvent lipids are insoluble ?
 (a) Chloroform (b) Water
 (c) Ether (d) All of the above
- Q.6. Ferritin is :
 (a) Milk protein (b) Iron storage protein
 (c) Egg white protein (d) None of the above
- Q.7. Which of the following is a saturated Fatty acid ?
 (a) Palmitic acid (b) Oleic acid
 (c) Linolenic acid (d) Linoleic acid
- Q.8. Vitamin is essential for formation of Rhodopsin :
 (a) Vitamin E (b) Folic acid
 (c) Retinol (d) Vitamin C
- Q.9. Symptoms of Gaucher's disease :
 (a) Liver and Spleen enlargement (b) Bone erosion
 (c) Mental retardation (d) All of the above
- Q.10. Function of Chlorine :
 (a) Acid-base balance (b) Osmotic balance
 (c) Both (a) and (b) (d) None of the above

Fill in the blanks :

- Q.11. Rickets and Osteomalacia is caused due to deficiency of.....
- Q.12. Qualitative test for lipid.....
- Q.13. Microcytic anaemia has.....sized RBCs.
- Q.14. RNA stands for.....
- Q.15. Carnuba wax is.....wax.

True/False :

- Q.16. Hepatic porphyria is caused due to deficiency of Zinc. (True/False)
- Q.17. Fats are liquid at room temperature. (True/False)
- Q.18. Kwashiorkor occurs due to Protein deficiency. (True/False)
- Q.19. Protein is a Sulphur containing B complex vitamin. (True/False)
- Q.20. Thrombocytopenia is defined as increased platelets. (True/False)