RAN-2006000101030002

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First MBBS (New) Examination

January - 2021

Biochemistry - Paper-2

(New CBME Pattern)

સૂચના : / Instructions

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નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ First MBBS (New)

Name of the Subject :

☛ Biochemistry -Paper-2 (New CBME Pattern)

Subject Code No.: 2006000101030002

Seat No.:

Student's Signature

Section A: MCQ (Separate paper attached) **(20 marks)**

Instructions:

1. All questions are compulsory
2. Each MCQ has only one correct answer
3. One mark for correct answer. No negative marking
4. If more than one answer is ticked, it will be treated as wrong answer
5. Any tempering with answer will be treated as wrong answer
6. Use only ball point black pen. Pencil is strictly prohibited
7. Correct answer must be marked on OMR sheet with black pen & submit in first 30 minutes

1 A nucleoside can be composed of all of the following, EXCEPT

a) Purine base b) Pentose sugar
c) Phosphate group d) Pyrimidine base

2 The two strands of DNA double helix are held together by:

a) Ionic bond b) Hydrogen bond
c) Nonpolar covalent bond d) Polar covalent bond

3 Which of the following amino acid is exclusively ketogenic?
a) Leucine b) Phenylalanine
c) Threonine d) Isoleucine

4 Transaminase enzymes belongs to the class:
a) Hydrolases b) Transferases
c) Oxidoreductases d) Isomerases

5 Enzymes belongs to which group of biomolecules?
a) Carbohydrates b) Proteins
c) Lipids d) Phospholipids

6 Hemoglobin is a:
a) Monomeric protein b) Trimeric protein
c) Tetrameric protein d) Dimeric protein

7 In Maple syrup urine disease, which of the following compound is accumulated?
a) Homogentisate
b) Methylmalonyl-CoA
c) Branched chain alpha keto acid
d) Homocysteine

8 Cysteine is synthesized from methionine and
a) Serince b) Homoserine
c) Homocysteine c) Threonine

9 Beriberi is caused by a deficiency of:
a) Thiamine b) Thymine
c) Threonine d) Tyrosine

10 Increased prothrombine time is observed in the deficiency of
a) Vitamin K b) Vitamin D
c) Vitamin A d] Vitamin K

11 Plasma albumin performs the following function, EXCEPT:
a) Maintenance of osmotic pressure
b) Transport
c) Solubilization of glucose
d) Nutritive

12 Which of the following protein(s) is/are acute phase protein(s)?
a) C-Reactive protein b) Fibrinogen
c) Haptoglobin d) All of the above

13 Formation of okazaki fragments occur in the process of:
a) Transcription b) Translation
c) Replication d) Reverse transcription

14 Reverse transcriptase catalyses:
a) Synthesis of RNA from DNA
b) Breakdown of RNA
c) Synthesis of DNA from RNA
d) Breakdown of DNA

15 The site to which RNA polymerase binds of the DNA template prior to the initiation of transcription
a) Intron/exon junction b) Promoter
c) Terminator d) Initiator methionine code

16 Which of the following causes frame shift mutation?
a) Transition b) Transversion
c) Deletion d) Substitution of purine to pyrimidine

17 Anticodons are present on:
a) Coding strand of DNA b) mRNA
c) tRNA d) tRNA

18 An operon is best described by:
a) A constitutively expressed gene system
b) An unregulated gene system
c) A coordinately regulated gene system
d) A gene that produces a monocistronic mRNA

19 A particular RNA in a mixture can be identified by:
a) Western blotting b) Eastern blotting
c) Northern blotting d) Southern blotting

20 Which of the following chromatographic techniques is based on molecular size?
a) Gel filtration chromatography
b) Ion exchange chromatography
c) Paper chromatography
d) Affinity chromatography

Instructions for section B & C:

1. Use blue/black ball point pen only.
2. The numbers to the right indicates full marks.
3. Draw diagrams wherever necessary

Section B:

Q 2: Long Answer Questions (ANY TWO OUT OF THREE) (2 × 10 = 20)

a) Describe the Absorption, transport, food sources, RDA, biochemical functions, therapeutic use and deficiency manifestations of vitamin A.
b) Describe transcription mechanism in prokaryotes and add a note on difference between prokaryotic and eukaryotic transcription.
c) Describe in detail about different types of enzyme inhibitions with suitable examples.

Q 3: Brief Answer Questions (ANY TEN OUT OF ELEVEN) (10 × 2 = 20)

a) Ubiquitin
b) Differences between eukaryotic and prokaryotic ribosomes
c) Deficiency manifestations of folic acid
d) Denaturation of protein
e) Pellagra like sign and symptoms are seen in Hartnup disease.
f) Detoxification of ammonia
g) Structure of t-RNA
h) Persons with sickle cell trait are resistant to malaria caused by Plasmodium falciparum.
i) Applications of recombinant DNA technology
j) Oncogens and Oncogenes are different - Explain
k) Biochemical basis of Alkaptonuria

Section C: (40 Marks)

Q 4: Short answer questions (ANY FOUR OUT OF FIVE) (4 × 5 = 20)

a) Mutation
b) Post translational modifications
c) Principle and applications of chromatography
d) Gout
e) Catabolism of heme

Q 5: Clinical Cases (ALL COMPULSORY) (2 × 10 = 20)

Case 1

A 7 year old male child was brought to the dental OPD with spongy, swollen gums which bled on touch. He was also suffering from pain and swelling in right knee. His diet contain mainly milk & Rice. No vegetables or Fruits were given to him. On investigation, the child was found to be anemic, it was microcytic hypochromic anemia.

1. Deficiency of which substance will produce these symptoms? Name the condition
2. Explain the reason for bleeding gums and painful swollen joint
3. What is the cause of anemia in this case?
4. What are the dietary sources of vitamin C?
5. If excessive doses of vit C are given, can it produce toxic effects? What is the recommended daily allowance of vitamin C?

Case 2

52 years old patient was admitted to the casualty department of hospital in a serious condition. He had become increasingly depressed after the death of his wife. His daughter found him in an unconscious state when she had come to see him in the morning. One and a half empty bottles of alcohol were found in the room. When the alcohol was examined for its contents it was found to be containing high amount of methanol. Doctors on duty diagnosed that it was a case of methanol intoxication and decided to start the intravenous infusion of ethanol

1. Which class of enzymes is required to metabolize alcohols?
2. Name the specific enzyme which acts on methanol
3. Why methanol is toxic?
4. Ethanol infusion is based on the principle of competitive inhibition. What is competitive inhibition?
5. In competitive inhibition K_m is increased but V_{max} is not affected. Explain