

Printing Pages:2
Enrollment No.

Paper Code: MBBS 131

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M.B.B.S.
First Professional Examination, 2023
BIOCHEMISTRY -I

[Time:Three Hours]

[Max. Marks :100]

Note: Attempt all the questions. Use separate answer sheets for Section A & Section B. Parts of a question must be attempted in sequence. Draw well labeled diagrams wherever necessary. MCQs (separate sheet will be provided) [01x20=20]

SECTION - A

1. A 62-year male with long standing hepatitis C [2+2+6=10]
with liver cirrhosis was admitted with features of encephalopathy.
 - a. What are the biochemical investigations that will aid diagnosis of this case?
 - b. What is the cause of coma in this condition?
 - c. How is ammonia detoxified in liver?
Explain step-wise.
2. Describe in brief: [5x5=25]
 - a. Acute intermittent porphyria (AIP)
 - b. Therapeutic enzymes
 - c. Amphibolic nature of TCA cycle
 - d. Maple syrup urine disease
 - e. Roles and responsibilities of a doctor
3. Describe the various inborn errors of carbohydrate metabolism. [5]

[P.T.O.]

SECTION - B

1. A 35 year old municipality cleaner had gone [2+2+6=10]
down a manhole to relieve a blockage in the
sewer line which was causing drainage issues
in the locality. Apparently, he hadn't used any
protective gear in a hurry. He came back after
1 hour in a delirious condition and soon
succumbed before he could be taken to the
hospital.
 - a. What is the likely cause of poisoning
in this case?
 - b. Describe the electron transport chain
in brief.
 - c. Write in detail the complex IV of
ETC and its inhibitors.
2. Write short notes on: [5x6=30]
 - a. Role of lipids in respiratory distress
syndrome
 - b. Electrophoretic picture of
hypergammaglobulinemia
 - c. Catabolism of odd chain fatty acids
 - d. Pyruvate dehydrogenase complex
 - e. Left shift of the oxygen dissociation
curve
 - f. Metabolic alkalosis

Enrollment No.

MBBS131

Invigilator's Signature

M.B.B.S.
FIRST PROFESSIONAL EXAMINATION 2023
BIOCHEMISTRY -I
Multiple Choice Questions

Time: 15 Minutes

Max. Marks: 20
 Marks Obt.:

Note: Write your Enrollment Number on the question paper. Each MCQ carries 01 mark. Each question has only one best correct response. Encircle the correct answer letter. More than one encircle, or any overwriting, will be considered as wrong answer. There is no negative marking. DO NOT use pencil for writing.

1. All are essential amino acids except:
 - a) Valine b) Isoleucine c) Methionine d) Glycine
2. In which one of the following tissues is glucose transport into the cell insulin sensitive?
 - a) Brain b) Lens of eye c) Red blood cells d) Adipose tissue
3. Increased formation of ketone bodies during fasting is a result of:
 - a) Decreased levels of circulating glucagon
 - b) Decreased formation of acetyl CoA in the liver
 - c) Increased levels of free fatty acids in blood
 - d) Decreased activity of hormone-sensitive lipase in adipose tissue
4. In deoxy hemoglobin (Hb), the Fe (II) is 5-coordinated to:
 - a) Four nitrogens of heme and to the proximal His of Hb
 - b) Four nitrogens of heme and to a water molecule
 - c) Four nitrogens of heme and to an O₂ molecule
 - d) Two nitrogens of heme and to three His residues in Hb
5. Which of the following is found abundantly in collagen?
 - a) Tryptophan b) Alanine c) Glycine d) Serine
6. When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained?
 - a) Straight line with negative slope b) Straight line with positive slope
 - c) Parabola d) Hyperbolic curve
7. Which of the following is a choline-containing lipid?
 - a) Phosphatidylethanolamine b) Phosphatidylserine c) Sphingomyelin d) Phosphatidylglycerol
8. Which of the following enzyme is responsible for the conversion of glucose 1-phosphate to glucose 6-phosphate?
 - a) Epimerase b) Phosphoglucomutase c) Glycogen phosphorylase d) Isomerase
9. Complex IV is also known as:
 - a) Cytochrome oxidase b) NADH dehydrogenase
 - c) Succinate dehydrogenase d) Cytochrome bc₁ complex
10. Why is the TCA cycle the central pathway of metabolism of the cell?
 - a) It occurs in the centre of the cell
 - b) Its intermediates are commonly used by other metabolic reactions
 - c) All other metabolic pathways depend upon it
 - d) None of the above

[P.T.O.]

11. Urea cycle occurs in the:
 a) Cytoplasm b) Mitochondria c) Both cytoplasm and mitochondria d) Endoplasmic reticulum
12. A medical student was admitted to hospital following a hunger strike. Which of the following **cannot** be used for gluconeogenesis by his body?
 a) Tyrosine b) Leucine c) Phenylalanine d) Tryptophan
13. Which one of the following statements concerning the peptide shown below is correct?
 Gly-Cys-Glu-Ser-Asp-Arg-Cys
- The peptide contains glutamine.
 - The peptide contains a side chain with a secondary amino group.
 - The peptide contains a majority of amino acids with side chains that would be positively charged at pH 7.
 - The peptide is able to form an internal disulphide bond.
14. Mucopolysaccharidoses are inherited lysosomal storage diseases. They are caused by:
- An increased rate of synthesis of the carbohydrate component of proteoglycans.
 - The synthesis of polysaccharides with an altered structure.
 - Defects in the degradation of the GAGs in proteoglycans.
 - The synthesis of abnormally small amounts of protein cores.
15. A tentative diagnosis of medium-chain fatty acyl CoA dehydrogenase (MCAD) deficiency is made. In patients with MCAD deficiency, the fasting hypoglycemia is a consequence of:
- Decreased acetyl CoA production.
 - Decreased ability to convert acetyl CoA to glucose.
 - Increased conversion of acetyl CoA to acetoacetate.
 - Increased production of ATP and NADH.
16. After profuse vomiting, what type of an acid-base disturbance is reflected in the ABG:
- Respiratory alkalosis
 - Respiratory acidosis
 - Metabolic alkalosis
 - Metabolic acidosis
17. Rate limiting enzyme of heme synthesis is:
- Heme synthase
 - ALA dehydrase
 - ALA synthase
 - Uroporphyrinogen synthase
18. Which one of the following amino acids participates in the synthesis of creatine and nitric oxide?
- Methionine
 - Glycine
 - Histidine
 - Arginine
19. Calcium absorption is interfered by:
- Protein in diet
 - Phytic acid in cereals
 - Alkaline intestinal pH
 - Vitamin D
20. Which of the following urine samples is preferred for steroid hormone estimation?
- Early stream specimen
 - Midstream specimen
 - Catheter specimen
 - 24-hour specimen

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M.B.B.S.

First Professional Examination, 2023

BIOCHEMISTRY -II

[Time: Three Hours]

[Max. Marks:100]

Note: Attempt all the questions. Use separate answer sheets for Section A & Section B. Parts of a question must be attempted in sequence. Draw well labeled diagrams wherever necessary.

MCQs (separate sheet will be provided)[01x20=20]

SECTION - A

1. PBQ

[10]

After a bout of alcohol consumption at night, a 40-year-old male presented to the emergency with severe pain, redness, and swelling at the base of the first metatarsophalangeal joint. He had woken up with a severe pain in his right big toe. The patient denies any trauma to his toe. His uric acid level was 10.6 mg/dL.

- What is the probable diagnosis? (1)
- Which drug will be prescribed in this condition and what is its mode of action? (3)
- What is the pathogenesis of this condition? (3)
- What is Von Gierkes disease and how does it cause similar symptoms as in this case? (3)

2. Describe in brief:

[5x5=25]

- Mode of action of hormones
- Biochemical role of vitamin B12
- Cell cycle and its regulation
- Role of the physician in health care system
- Post-translational modifications in protein biosynthesis

3. Describe the process of replication in prokaryotes.

[5]

[P.T.O.]

SECTION - B

1. PBQ

[10]

A 50-year-old patient visited the OPD due to difficulty in seeing objects at night. He also complained of dryness of his eyes. There was no history of diabetes, hypertension, smoking, or any eye injury. On physical examination his conjunctiva was found to be dry and wrinkled with greyish spots on it.

- a. What is the most probable diagnosis? (1)
- b. What are the greyish spots called and why are they formed? (2)
- c. What is the visual cycle? Explain it with the help of a diagram. (4)
- d. What are the other ocular and epithelial manifestations that can be caused if the deficiency persists? (3)

2. Write short notes on:

[5x6=30]

- a. PCR
- b. Tumor markers
- c. Phase II reaction of xenobiotics
- d. PEM
- e. Diagnostic enzymes
- f. Immunoglobulins

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MBBS-132

Invigilator's Signature

M.B.B.S
FIRST PROFESSIONAL EXAMINATION 2023
BIOCHEMISTRY -II
Multiple Choice Questions

Time: 15 Minutes

Max. Marks: 20
Marks Obt.:

Note: Write your Enrollment Number on the question paper. Each MCQ carries 01 mark. Each question has only one best correct response. Encircle the correct answer letter. More than one encircle, or any overwriting, will be considered as wrong answer. There is no negative marking. **DO NOT** use pencil for writing.

1. Which complex is involved in translation?
 - a. Polysome
 - b. Nucleosome
 - c. Spliceosome
 - d. Lysosome
2. All the following can lead to deficiency of iron **except**:
 - a. Hookworm infection
 - b. Pagets's disease
 - c. Lead poisoning
 - d. Repeated pregnancies
3. Which one of the following enzymes is involved in detoxification?
 - a. Cytochrome P450 enzymes
 - b. Transaminases
 - c. Dehydrogenases
 - d. Decarboxylases
4. Which enzyme protects DNA from ageing?
 - a. DNA polymerase
 - b. Topoisomerase
 - c. Deoxyribonuclease
 - d. Telomerase
5. Which of the following post-translational events is defective in mad cow disease?
 - a. Amino terminal modification
 - b. Protein folding
 - c. Phosphorylation of serine residues
 - d. Glycosylation of asparagine
6. Post translational modifications include all the following **except**:
 - a. Glycosylation
 - b. Hydroxylation
 - c. Decarboxylation
 - d. Phosphorylation
7. Which enzyme is used for preparing a recombinant DNA molecule?
 - a. Restriction endonucleases
 - b. RNA polymerase
 - c. DNA polymerase
 - d. Topoisomerase
8. Which of the following immunoglobulin is involved in the primary immune response?
 - a. IgG
 - b. IgM
 - c. IgA
 - d. IgD
9. Zinc is present in all the following enzymes, **except**:
 - a. Alkaline phosphatase
 - b. Amylase
 - c. Carbonic anhydrase
 - d. RNA polymerase
10. The most important biological role for vitamin E is:
 - a. To produce clotting factors
 - b. As antidote of selenium poisoning
 - c. As an anticoagulant
 - d. As an antioxidant

[P.T.O.]

11. Pellagra is due to the deficiency of:
a. Niacin
b. Thiamine
c. Vitamin B₁₂
d. Riboflavin
12. The DNA polymerase used in PCR is derived from the following bacteria:
a. Haemophilus aegypticus
b. Thermus aquaticus
c. Escherichia coli
d. Haemophilus influenza
13. Hormone-receptor complex binds to DNA at:
a. Promoter element
b. TATA box
c. Operator site
d. HRE
14. Northern blotting technique is used for the detection of:
a. RNA
b. DNA
c. Proteins
d. All the above
15. The receptor of the following hormone has intrinsic tyrosine kinase activity:
a. Insulin
b. ADH
c. Steroids
d. Thyroid hormone
16. Initiation codon is recognized in eukaryotic translation with the help of:
a. eIF-4F
b. Shine-Dalgarno sequence
c. Kozak consensus sequence
d. eIF-2
17. One of the following amino acids has six codons:
a. Tryptophan
b. Methionine
c. Serine
d. Lysine
18. Which one of the following antibiotics inhibits the enzyme peptidyl transferase?
a. Puromycin
b. Erythromycin
c. Chloramphenicol
d. Tetracyclin
19. Which of the following is an example of phase I detoxification?
a. Sulfation
b. Acetylation
c. Methylation
d. Oxidation
20. Lysine is deficient in:
a. Cereals (rice, wheat)
b. Maize and corn
c. Pulses
d. Tapioca
