

**BIOCHEMISTRY
PAPER- FIRST**

Note: Attempt all questions.
Draw suitable diagrams (wherever necessary)

- Q. 2. Give reasons why:** (1 x 5 = 05)
- Ammonia is toxic
 - Folate and B₁₂ deficiency can cause homocystinuria
 - Inulin is used to measure GFR
 - Pellagra like symptoms are seen in Hartnup's disease
 - IgA is called a secretory antibody
- Q. 3. Problem based question:** (1 x 5 = 05)
- A patient presented with recurrent urolithiasis, hematuria and associated recurrent UTI. On renal stone analysis cystine stones were detected. Chromatography and electrophoresis were done on the urine sample to study the amino acid excretion pattern.
- What is the probable diagnosis?
 - What is the biochemical basis of this defect?
 - Which other dibasic amino acids are excreted in the urine?
 - Name two important compounds formed from cysteine.
 - How is cysteine synthesized from homocysteine?
- Q. 4. Write short notes on:** (2.5 x 4 = 10)
- Primary and secondary causes for gout
 - Amphibolic role of TCA cycle
 - Define PCR and its applications
 - Types of RNA and the structure of t RNA
- Q. 5. (i)** Describe isoenzymes with two suitable examples. Write the importance of serum enzymes in the diagnosis of liver disease. (3+2 = 05)
- (ii)** Write the process of prokaryotic transcription. What are the post transcriptional modifications? (3+2 = 05)
- Q. 6. Write in brief:** (2.5 x 4 = 10)
- Conjugated hyperbilirubinemia
 - Functions of nucleotides
 - Protein energy malnutrition
 - Alkaptonuria

M.B.B.S. FIRST PROFESSIONAL EXAMINATION, AUGUST-2019

BIOCHEMISTRY

PAPER - FIRST

[Time allotted: Three hours]

SET - B

[Max Marks: 50]

Q. 1. Multiple choice questions (attempt all MCQs in the allotted first 20 minutes in the OMR sheet) (½ x 20 = 10)

1. Glycine in combination with which of the following amino acids forms glutathione?
 - a. Glutamate and cysteine
 - b. Glutamine and cysteine
 - c. Aspartate and methionine
 - d. Asparagine and tyrosine
2. The method employed in the analysis of products of polymerase chain reaction:
 - a. Isoelectric focusing
 - b. Immuno electrophoresis
 - c. Capillary electrophoresis
 - d. PAGE
3. The ratio between the distance travelled by the substance and the distance travelled by solvent front is known as:
 - a. Rf
 - b. Rs
 - c. pH
 - d. pI
4. Substrate level phosphorylation in TCA cycle occurs during the following:
 - a. Oxidative decarboxylation of isocitrate to α -ketoglutarate
 - b. Oxidative decarboxylation of α -ketoglutarate to succinyl CoA
 - c. Formation of succinate from succinyl CoA
 - d. Oxidation of succinate to fumarate
5. Which statement is **not** true regarding albumin?
 - a. Synthesized by liver
 - b. Has maximum buffering capacity
 - c. Transports bilirubin
 - d. Excreted in urine
6. The enzyme responsible for preventing super coiling of DNA, produced during unwinding of DNA in-replication is:
 - a. Helicase
 - b. Primase
 - c. Topoisomerase
 - d. Ligase
7. Which one of the following amino acids occurs most frequently in active site?
 - a. Glycine
 - b. Proline
 - c. Serine
 - d. Valine
8. Aldolase belongs to which class of enzymes:
 - a. Lyases
 - b. Dehydrogenases
 - c. Oxidoreductases
 - d. Transferases
9. Site in ETC which is **not** coupled to ATP synthase reaction:
 - a. NADH - CoQ reductase
 - b. Succinate - CoQ reductase
 - c. Cytochrome bc1 reductase
 - d. Cytochrome oxidase
10. All the following statements about thalassemias are true, **except**:
 - a. When one α gene is deleted the condition is considered as silent carrier state
 - b. β thalassemia major is a heterozygous state
 - c. When two α gene are deleted the condition resembles as β -thalassemia minor
 - d. All four α gene are deleted in Bart's Hb
11. All the following amino acids contain hydroxyl group, **except**:
 - a. Serine
 - b. Lysine
 - c. Threonine
 - d. Tyrosine
12. TCA is operative only in the presence of O₂ because:
 - a. O₂ is consumed in the cycle
 - b. O₂ is essential for the synthesis of acetyl CoA
 - c. O₂ is required for the substrate level phosphorylation
 - d. O₂ acts as the electron acceptors in respiratory chain and regenerates NAD⁺ and FAD
13. Endoplasmic reticulum is site for:
 - a. Biologic oxidation
 - b. Drug detoxification
 - c. Lipid synthesis
 - d. Both b & c
14. Hyperuricemia can result from defect in all of the following enzymes **except**:
 - a. Carbamoyl phosphate synthetase II
 - b. HGPRTase
 - c. PRPP synthase
 - d. Glucose-6-phosphatase
15. All of the following lipids are present in cell membranes **except**:
 - a. Lecithin
 - b. Sphingomyelin
 - c. Cholesterol
 - d. Triacylglycerol
16. The SDA is the highest for the following nutrient:
 - a. Proteins
 - b. Fats
 - c. Carbohydrates
 - d. Vitamins
17. A diabetic diet should contain:
 - a. Refined carbohydrates
 - b. Foods with high glycemic index
 - c. Foods with low glycemic index
 - d. Large quantities of roots and tubers
18. Which immunoglobulin has the highest serum concentration?
 - a. IgG
 - b. IgM
 - c. IgA
 - d. IgD
19. Peptidyl transferase activity of 50 S RNA is inhibited by:
 - a. Rifampicin
 - b. Cycloheximide
 - c. Chloramphenicol
 - d. Erythromycin
20. ALA dehydratase is present in:
 - a. Mitochondria
 - b. Cytoplasm
 - c. Peroxisomes
 - d. Golgi apparatus

BIOCHEMISTRY
PAPER- SECOND

Note: Attempt all questions.
Draw suitable diagrams (wherever necessary)

- Q. 2. Give reasons:** (1 x 5 = 05)
- a. Ineffectiveness of salivary amylase in stomach
 - b. Steatorrhea leads to fat soluble vitamin deficiency
 - c. Insulin therapy in diabetic coma leads to hypokalemia
 - d. Chronic alcoholics may develop Wernicke Korsakoff syndrome
 - e. Lactase enzyme deficiency leads to diarrhea in infants after breast feeding

- Q. 3. Problem based question:** (1 x 5 = 05)

A 24 year old male was admitted to hospital with history of jaundice. Lab results are as follows:-

S. Total Bilirubin = 22.0 mg/dl, Conjugated Bilirubin = 16 mg/dl, Unconjugated Bilirubin = 6 mg/dl, AST= 80 IU/L, ALT= 90 IU/L, ALP = 140 KAU/L,

Urine - Bile salts - Present
 Bile pigments - Present
 Urobilinogen - Negative
 Feces - Stercobilinogen - Negative

- a. What is the type of jaundice?
- b. Write the different causes of this type of jaundice.
- c. Comment on the results.
- d. What will be the color of urine & stool?
- e. Define 1 KAU.

- Q. 4. Write short notes on:** (2.5 x 4 = 10)

- a. Oncogenes
- b. Mechanism of steroid hormone action
- c. Metabolic acidosis and its compensation
- d. Phase-I reactions of detoxification

- Q. 5. (i) Describe β -oxidation of palmitic acid in detail. Write its energetics.** (4+1 = 5)

(ii) Write RDA, rich sources and biochemical functions of calcium. Describe in detail the homeostasis of plasma calcium level (1+1+3 = 5)

- Q. 6. Write in brief about:** (2.5 x 4 = 10)

- a. Renin angiotensin system
- b. Wald's visual cycle
- c. Metabolic changes during starvation
- d. Significance of HMP shunt pathway

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M.B.B.S. FIRST PROFESSIONAL EXAMINATION, AUGUST-2019

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[Max Marks: 50]

SET - A

[Time allotted: Three hours]

Q. 1. Multiple choice questions (attempt all MCQs in the allotted first 20 minutes in the OMR sheet) (½ x 20 = 10)

1. Following is a non-reducing carbohydrate:
 - a. Maltose
 - b. Galactose
 - c. Lactose
 - d. Sucrose
2. Uronic acid is absent in following GAG:
 - a. Keratan sulphate
 - b. Dermatan sulphate
 - c. Hyaluronic acid
 - d. Heparan sulphate
3. End product of glycolysis in RBC is:
 - a. Pyruvate
 - b. Lactate
 - c. Acetyl CoA
 - d. CO₂ and H₂O
4. Glucose and galactose are:
 - a. Anomers
 - b. Epimers
 - c. Enantiomers
 - d. None of the above
5. Respiratory distress syndrome in premature infants is due to the deficiency of:
 - a. Plasmalogen
 - b. Dipalmitoyl lecithin
 - c. Cardiolipin
 - d. Cephalin
6. All of the following are amphipathic except:
 - a. Cholesterol
 - b. Phospholipids
 - c. Glycolipids
 - d. Triacylglycerols
7. Rapaport-Leubering cycle is associated with the synthesis of:
 - a. 1, 3-bisphosphoglycerate
 - b. 2, 3-bisphosphoglycerate
 - c. Phosphoenol pyruvate
 - d. Glyceraldehyde-3phosphate
8. All the following substances serve as precursors for gluconeogenesis, except:
 - a. Lactate
 - b. Glycerol
 - c. Pyruvate
 - d. Leucine
9. All steroid hormones are formed from:
 - a. Cholesterol
 - b. Purines
 - c. Glycerol
 - d. Protein
10. The concentration of the following enzyme is elevated in rickets:
 - a. ALT
 - b. AST
 - c. ALP
 - d. None of the above
11. Fatty acid is activated to acyl CoA by the enzyme:
 - a. Thiokinase
 - b. Acyl transferase
 - c. Pancreatic lipase
 - d. Lipid esterase
12. The following molecule is considered to be the common metabolic end product of carbohydrates, lipids and proteins:
 - a. Pyruvate
 - b. Succinyl CoA
 - c. Acetyl CoA
 - d. Lactate
13. The de novo biosynthesis of fatty acids occurs in:
 - a. Mitochondria
 - b. Cytosol
 - c. Nucleus
 - d. Plasma membrane
14. All the following substances promote Ca²⁺ absorption, except:
 - a. Vitamin D
 - b. Parathyroid hormone
 - c. Lysine and arginine
 - d. Phytates
15. Which of the following is the major contributor of plasma osmolality?
 - a. Na⁺ and associated anions
 - b. K⁺ and associated anions
 - c. Glucose
 - d. Urea
16. Angiotensin-converting enzyme (ACE) inhibitor drugs are used in the treatment of:
 - a. Diabetes mellitus
 - b. Nephrotic syndrome
 - c. Congestive cardiac failure
 - d. All of the above
17. Which of the following will be elevated in the bloodstream about 1 to 2 hours after eating a high-fat meal?
 - a. Chylomicrons
 - b. High density lipoproteins
 - c. Ketone bodies
 - d. Non-esterified fatty acids
18. Deficiency of which one of these vitamins may lead to megaloblastic anaemia?
 - a. Vitamin B6
 - b. Vitamin B12
 - c. Vitamin D
 - d. Vitamin E
19. Which of the following types of oxygen radical damage may lead to the development of atherosclerosis and coronary heart disease?
 - a. Chemical modification of DNA bases in somatic cells
 - b. Oxidation of amino acids in cell membrane proteins
 - c. Oxidation of amino acids in mitochondrial proteins
 - d. Oxidation of unsaturated fatty acids in plasma lipoproteins
20. Which of the following best explains the difference between creatinine clearance and inulin clearance as tests of renal function?
 - a. Creatinine clearance is higher than inulin clearance because creatinine is actively secreted in the distal renal tubules
 - b. Creatinine clearance is higher than inulin clearance because inulin is actively secreted in the proximal renal tubules.
 - c. Creatinine clearance is higher than inulin clearance because inulin is actively secreted in the distal renal tubules.
 - d. Creatinine clearance is lower than inulin clearance because creatinine is actively secreted in the distal renal tubules