Regn. No. .....

Paper Code: MBBS102

M.B.B.S. FIRST PROFESSIONAL EXAMINATION, JULY/AUGUST- 2018

BIOCHEMISTRY

PAPER - FIRST

[Time allotted: Three hours] **SET - A** **[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. Tetracycline inhibits protein synthesis by inhibiting:
   a. Binding of aminoacyl tRNA to ribosome
   b. Initiation of translation
   c. Peptidyl transferase
   d. Translocase enzyme
2. Microfilaments in the cell are made up of:
   a. Myosin
   b. Actin
   c. Chitin
   d. Keratin
3. Which of the following has highest calorific value?
   a. Glucose
   b. Albumin
   c. Palmitic acid
   d. Ethanol
4. A method used to amplify the DNA:
   a. Electrophoresis
   b. Use of reverse transcriptase
   c. Restriction fragment length polymorphism
   d. Polymerase chain reaction
5. If salt is added to DNA it will:
   a. Not affect the Tm
   b. Both increase or decrease the Tm depending on the amount of salt
   c. Increase the Tm
   d. Decrease the Tm
6. Which of the following best describes the tertiary structure of a protein?
   a. The α-helical portion of a protein
   b. The β-pleated sheet portion of a protein
   c. A discrete region of a polypeptide chain that has folded into a self-contained three-dimensional structure
   d. The arrangement of two or more polypeptide subunits into a single functional complex
7. Optically inactive amino acid is:
   a. Alanine
   b. Serine
   c. Glycine
   d. Cysteine
8. Methionine, valine and isoleucine are linked to TCA cycle through which of the following:
   a. Pyruvate
   b. Citrate
   c. α-Ketoglutrate
   d. Succinyl CoA
9. Atoms 4, 5 & 7 of purine nucleus are provided by:
   a. Aspartate
   b. Glutamine
   c. Glycine
   d. Methionine
10. The coenzyme for transamination reaction is:
    a. TPP
    b. FMN
    c. FAD
    d. PLP
11. Substrates required for hemoglobin biosynthesis are:
    a. Active acetate and glycine
    b. Active succinate and lysine
    c. Glycine and formate
    d. Active succinate and glycine
12. An important derivative of histidine is the local hormone named as:
    a. Adrenaline
    b. Histamine
    c. Epinephrine
    d. Serotonin
13. In oxidative phosphorylation the oxidation of one molecule of $FADH_2$ produces:
    a. 1 ATP molecule
    b. 2.5 ATP molecules
    c. 1.5 ATP molecules
    d. 3 ATP molecules
14. Unusual nucleotide pseudouridylic acid is present in:
    a. mRNA
    b. tRNA
    c. rRNA
    d. hnRNA
15. An uncoupler of oxidative phosphorylation such as dinitrophenol:
    a. Inhibits electron transport and ATP synthesis
    b. Allows electron transport to proceed without ATP synthesis
    c. Inhibits electron transport without affecting ATP synthesis
    d. Specifically inhibits cytochrome b
16. Mitochondria are associated with all of the following **except**:
    a. Oxidation of carbohydrates and lipids
    b. Urea and heme synthesis
    c. Hydrolysis of various macromolecules at low pH
    d. Energy conservation
17. The amino acid containing guanidine group is:
    a. Arginine
    b. Histidine
    c. Tyrosine
    d. Tryptophan
18. Which of the following is a natural uncoupler?
    a. Cortisol
    b. Thyroxine
    c. Prolactin
    d. Biotin
19. The principal plasma protein responsible for exerting colloidal osmotic pressure is:
    a. Haemoglobin
    b. Globin
    c. Albumin
    d. Haptoglobin
20. Some enzymes covalently bind a non-protein organic molecule to the active site. The organic molecule concerned is required if the enzyme is to catalyze a reaction on a substrate. What is the term used for such a molecule?
    a. Coenzyme
    b. Cofactor
    c. Modulator
    d. Prosthetic group

BIOCHEMISTRY

PAPER- FIRST

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

Q. 2. Give reasons why: **(5 x 1= 05)**

a. Cholesterol is an essential component of the cell membrane
b. Isoenzymes have different Km values
c. The genetic code is unambiguous in nature
d. Heme synthesis is up-regulated by drugs like barbiturates
e. Clay coloured stools occur in post-hepatic jaundice

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

A child is suffering from protein malnutrition. He is advised to take a protein rich diet and a mixture of nutritionally essential amino acids.

a. Why some of them are called nutritionally essential and others semi essential amino acids?
b. Name an essential amino acid which is sulfur containing.
c. Is hydroxy-lysine present in proteins? Has it got its specific codon(s)?
d. What is Kwashiorkar?
e. What is the role of vitamin C in the formation of certain amino acids? State with examples.

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

a. Phenylketonuria
b. Competitive and noncompetitive inhibition
c. Electron transport chain and the sites of its inhibition
d. Lac-operon

Q. 5. Structured questions:

(i). Describe the process of replication and add a note on DNA repair mechanisms. **(3+2 = 05)**

(ii). Classify enzymes giving two examples of each class. Explain mode of action of enzymes in terms of activation energy with the help of a diagram. **(3+2 = 05)**

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

a. Types of porphyrias
b. Draw the structure of an immunoglobulin
c. Hyperuricemia
d. Post-translational modifications

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BIOCHEMISTRY

PAPER - SECOND

SET – A

[Time allotted: Three hours] [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. Some amount of free glucose is produced in glycogenolysis by the action of:
   a. Glycogen phosphorylase
   b. Debranching enzyme
   c. Phospho glucomutase
   d. None of the above
2. The defect in muscle glycogen phosphorylase causes:
   a. Cori's disease
   b. Mc Ardle's disease
   c. Pompe's disease
   d. Anderson's disease
3. Transketolase is dependent on the following coenzyme:
   a. Coenzyme A
   b. NAD^+
   c. Tetrahydrofolate
   d. TPP
4. Wernicke-Korsakoff syndrome may occur due to:
   a. Deficiency of G6PD
   b. Defective transketolase
   c. Defective glutathione
   d. None of the above
5. Deficiency of the following enzyme causes hereditary fructose intolerance:
   a. Aldolase B
   b. Aldolase A
   c. Fructokinase
   d. Glycerol kinase
6. Humans cannot synthesize vitamin C due to the deficiency of the following enzyme:
   a. UDP-glucose dehydrogenase
   b. Glucuronidase
   c. L-gulonolactone oxidase
   d. Xylitol dehydrogenase
7. Pancreatic secretions are rich source of:
   a. Phospholipase A1
   b. Phospholipase A2
   c. Phospholipase C
   d. Phospholipase D
8. The defect in enzyme hexosaminidase causes:
   a. Gaucher's disease
   b. Farber's disease
   c. Tay-Sach's disease
   d. Krabbe's disease
9. Which one of the following enzymes is inhibited by aspirin?
   a. Lipoxygenase
   b. Cycloxygenase
   c. Phospholipase C
   d. Phospholipase A2
10. The eskimos in Greenland are protected from heart attacks because their staple diet is marine fish, which contains large quantities of one of the following PUFA:
    a. Arachidonic acid
    b. Linoleic acid
    c. Linolenic acid
    d. Eicosapentaenoic acid
11. Fatty acids released from adipose tissue by lipolysis are transported in the blood in a bound form to:
    a. Globulin
    b. Albumin
    c. LDL
    d. HDL
12. Which one of the following compounds inhibits the carnitine shuttle?
    a. Acetyl CoA
    b. Acyl CoA
    c. Malonyl CoA
    d. Propionyl CoA
13. The conversion of propionyl CoA to succinyl CoA requires the following vitamins:
    a. Thiamine and pantothenic acid
    b. Niacin and riboflavin
    c. Folic acid and cobalamin
    d. Biotin and cobalamin
14. Absence of peroxisomes in the tissue results in:
    a. Refsum's disease
    b. Zellweger's syndrome
    c. SCID
    d. Methyl malonic aciduria
15. The activity of LCAT is associated with:
    a. LDL
    b. VLDL
    c. Chylomicron
    d. HDL
16. Which one of the following apoprotein activates lipoprotein lipase?
    a. Apo A-1
    b. Apo B-48
    c. Apo C-II
    d. Apo E
17. Elevated circulating levels of one of the following lipid is associated with pancreatitis:
    a. Total cholesterol
    b. LDL cholesterol
    c. HDL cholesterol
    d. Triacylglyerol
18. Which of the following glycosaminoglycans is unsulphated?
    a. Chondroitin sulphate
    b. Heparin
    c. Hyaluronic acid
    d. Keratan sulphate
19. Which of the following lipid is deficient in infants with respiratory distress syndrome?
    a. Cephalin
    b. Cardiolipin
    c. Leukotrienes
    d. Dipalmitoyl lecithin
20. Which of the following is **not** required for fatty acid synthesis:
    a. Niacin
    b. Cobalamin
    c. Pantothenic acid
    d. Biotin

BIOCHEMISTRY

PAPER- SECOND

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

Q. 2. Give reasons why: **(1 x 5= 5)**

a. TCA cycle is important for fatty acid biosynthesis
b. Congenital cataract occurs in galactosemia
c. Severe hyperglycemia and liver damage are features of hereditary fructose intolerance
d. Hepatic coma occurs in terminal stages of cirrhosis of the liver
e. Prophylactic intramuscular injection of vitamin K is given to new born babies in a single 1 mg dose

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

A chronic alcoholic is suffering from ataxia, loss of memory, confusion, vestibular disturbance, ocular motility disturbances. The clinical diagnosis is Wernicke-Korsakoff syndrome.

a. Deficiency of which vitamin causes this disease?
b. What is the coenzyme form of the vitamin?
c. Write two metabolic reactions utilizing this coenzyme form.
d. Explain dry Beri-Beri, wet Beri-Beri and infantile Beri-Beri.
e. How can the condition be reversed?

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

a. Phase II detoxification
b. Isomerisms exhibited by glucose
c. Cell membrane receptor mechanism of hormone action
d. Radioisotopes

Q. 5. Structured questions:

(i) Describe structure of HDL and explain its role in reverse transport of cholesterol. **(2+3=05)**

(ii) List the normal ranges for fasting & post prandial glucose. How is blood glucose regulated in the body? Add a note on glycosylated haemoglobin. **(1+3+1=05)**

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

a. Tests for renal tubular function
b. Ocular manifestations of mild, moderate & severe vitamin A deficiency
c. Diagrammatic representation of a proteoglycan aggregate
d. Diagramatically show the renal mechanisms for regulation of acid base balance