

**Madhya Pradesh Medical Science University,
Jabalpur
MBBS First Professional Examination April-2022
Subject- Biochemistry
Paper-I**

Maximum Marks :100

Time: 3:00 Hours

Instructions:

- a) All questions are compulsory
- b) Draw diagrams wherever necessary
- c) Answers of Questions and Sub-questions must be written strictly according to serial order of question paper.
- d) MCQ has to be answered in theory answer book
- e) Please write MCQ answer neatly and in serial order with black or blue pen in brackets; for example: - 1. (a) 2. (c)
- f) MCQ has to be answered only once, any kind of repetition or cutting or erasing or whitener will be considered as malpractice, such answers will not be counted in marks and action will be taken according to UFM rules of university.

Q1. Total MCQs: $20 \times 1 = 20$

1. Which of the following is not essential fatty acid
(a) oleic acid (b) linoleic acid (c) arachidonic acid (d) linolenic acid
2. An amino acid required for porphyrin synthesis is

(a) proline (b) glycine (c) serine (d) histidine

3. The main source of reducing equivalents NADPH for lipogenesis is

(a) pentose phosphate pathway (b) citric acid cycle (c) glycolysis (d) glycogenolysis

4. The hormones that bind to cell surface receptor and requires the second messenger action is

(a) thyroxine (b) estrogen (c) FSH (d) glucocorticoids

5. Uncoupling agent of oxidative phosphorylation is

(a) fructose 1,6 bisphosphate (b) 2,4 dinitrophenol (c) NADP (d) urea

6. Acute pancreatitis may be diagnosed by the estimation of following enzyme

(a) alanine transaminase (b) acid phosphatase (c) amylase (d) alkaline phosphatase

7. Which organelle is referred to as the 'incinerator' of the cell containing hydrolytic enzymes

(a) lysosome (b) ribosome (c) peroxisome (d) golgi apparatus

8. Phospholipid acting as lung surfactant

(a) phosphatidyl inositol (b) cephalin (c) dipalmitoyl lecithin (d) sphingomyelin

9. Pellagra occurs due to deficiency of vitamin

(a) B1 (b) B2 (c) B3 (d) B5

10. High K_m means enzyme's affinity for

(a) inhibitor is high (b) substrate is high (c) inhibitor is low (d) substrate is low

11. Von Gierke's disease occurs due to deficiency of the following enzyme

(a) muscle glycogen phosphorylase (b) glucose-6-phosphatase (c) debranching enzyme (d) glucose-6-phosphate dehydrogenase

12. Which of the following complexes is inhibited by cyanide

(a) complex I (b) complex II (c) complex III (d) complex IV

13. Which of the following mucopolysaccharide acts as a lubricant in joints

(a) chondroitin sulfate (b) keratan sulfate (c) dermatan sulfate (d) hyaluronic acid

14. Which of the following is a semi essential amino acid

(a) lysine (b) arginine (c) tyrosine (d) tryptophan

15. Normal range of serum cholesterol is

(a) 100-150 mg/dL (b) 150-200 mg/dL (c) 200-250 mg/dL (d) 250-300 mg/dL

16. Wilson's disease is due to excess of which mineral

(a) cobalt (b) iodine (c) copper (d) fluorine

17. Which of the following enzymes in glycolytic pathway is inhibited by fluoride

(a) glyceraldehyde-3-phosphate dehydrogenase (b) phosphoglycerate kinase (c) pyruvate kinase (d) enolase

18. The regulatory key enzyme of cholesterol synthesis is

(a) HMG CoA synthase (b) HMG CoA reductase (c) HMG CoA lyase (d) mevalonate kinase

19. Reference range of serum calcium is

~~(a) 3-4 mg/dL (b) 9-11 mg/dL (c) 4-5 mg/dL (d) 96-106~~

20. Which of the following hormone acts a physiological uncoupler

(a) cortisol (b) insulin (c) glucagon (d) thyroxine

Q2. Short Answer Questions 10 x 5 = 50

a. Enumerate any 5 phospholipids with their biochemical role

b. Mechanisms of enzymes inhibition

c. Describe calcium metabolism

d. Regulation of blood glucose

e. Explain the fluid mosaic model of cell membrane

f. Explain the phase I of xenobiotic metabolism

g. Mucosal block theory of iron absorption

h. Describe fatty liver and add note on lipotropic factors

i. Electron transport chain

j. A two-month-old child was brought to pediatrician with complaints of vomiting after each feed. Mother gave history of

failure to gain weight and frequent diarrhea for the last 1 month. On physical examination, child had jaundice and

cataract. Benedict's test was positive and glucose oxidase test was negative (1+1+3)

i. What is the most probable inborn error of metabolism

ii. Name the enzyme deficient

iii. Explain the biochemical basis of jaundice and cataract

Q3. Long Answer Questions 3 x 10 = 30

a. A sixty-year-old male was admitted in Medicine ICU with complaints of severe chest pain and profuse sweating. His ECG showed the changes of acute myocardial infarction. Mention different biochemical tests for confirming the above diagnosis along with its reference range. Describe the different diagnostic and prognostic enzymatic markers with their change in concentration with time in the above case. (4+6)

b. Describe biosynthesis of urea. How it is regulated, add a note on disorders related to it. (5+2+3)

C. 1. A 15-year-old high school boy had difficulty in performing his work in dim light. Dietary history revealed he does not like following foods -carrots, papaya and fish liver oil. Based on history and chief complaint the probable diagnosis would be? Name the biochemical compound which is responsible for the above condition. (2)

II. Discuss its metabolism under following headings (1+4+3)

i. Requirement

ii. Functions
