

**Madhya Pradesh Medical Science University,
Jabalpur**
MBBS First Professional Examination April-2022
Subject- Biochemistry
Paper-II
(NEW SCHEME)

Time: 3:00 Hours

Maximum Marks :100

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

20 x 1 = 20

1. Rate limiting enzyme in heme synthesis is

~~(a) heme synthase~~

- (b) ALA dehydratase
 - (c) ALA synthase
 - (d) uroporphyrinogen synthase
2. Normal range of albumin is
- (a) 3.5-5.5 gm/dL
 - (b) 6-8 gm/dL
 - (c) 3.5-5.5 mmol/dL
 - (d) 6-8 mmol/dL
3. Conjugated hyperbilirubinemia with increased alkaline phosphatase level is present in
- (a) viral hepatitis
 - (b) obstructive jaundice
 - (c) hemolytic jaundice
 - (d) physiological jaundice
4. The first protein to be excreted in urine in glomerular damage is
- (a) albumin
 - (b) transferrin
 - (c) hemoglobin
 - (d) Bence jones protein
5. Major intracellular cation is
- (a) sodium
 - (b) potassium
 - (c) magnesium
 - (d) calcium
6. Basal metabolic rate is increased by all the following EXCEPT
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- (a) fever
 - (b) thyroxine
 - (c) starvation
 - (d) cold climate
7. The normal range of plasma bicarbonate is
- (a) 5-7 mEq/L
 - (b) 10-15 mEq/L
 - (c) 21-26 mEq/L
 - (d) 30-37 mEq/L
8. Which of the following hormones affects fluid and electrolyte balance
- (a) epinephrine
 - (b) glucagon
 - (c) thyroxine
 - (d) aldosterone
9. RNA in a mixture can be identified by
- (a) southern blotting
 - (b) northern blotting
 - (c) western blotting
 - (d) none
10. Specific dynamic action for protein is
- (a) 5%
 - (b) 13%
 - (c) 30%
 - (d) 60%
11. Tumour suppressor gene are sometimes called
- ~~(a) antioncogenes~~
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- (b) proto-oncogenes
- (c) oncogene
- (d) proximate carcinogen

12. Serum urea and creatine are markers of

- (a) liver function
- (b) renal function
- (c) pancreatic function
- (d) gastric function

13. Immunoglobulins are classified on basis of

- (a) light chains
- (b) heavy chains
- (c) carbohydrate content
- (d) electrophoretic ability

14. In a 70 kg adult, the total body water content is

- (a) 42L
- (b) 28L
- (c) 14L
- (d) 3.5L

15. Which of the following separates DNA like a zip opener

- (a) DNA ligase
- (b) DNA polymerase
- (c) DNA helicase
- (d) DNA topoisomerase

16. Human genome map where genes are visualized as bands with the help of a chemical dye is

- (a) cytogenetic map
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- (b) gene linkage map
- (c) restriction fragment length
- (d) physical map

17. All of the following are terminating codons EXCEPT

- (a) UAA
- (b) UGG
- (c) UAG
- (d) UGA

18. All of the following are anti-oxidant enzymes EXCEPT

- (a) superoxide dismutase
- (b) catalase
- (c) glutathione peroxidase
- (d) cytochrome p450 mono-oxygenase

19. A boy was stung by an unknown insect. He experienced respiratory distress within minutes and lapsed into unconsciousness. This may be mediated by

- (a) IgG
- (b) IgE
- (c) sensitized T cells
- (d) complement

20. DNA synthesis or extension is the third step of PCR, which is carried out at

- (a) 95°C
- (b) 55°C
- (c) 72°C
- (d) room temperature

Q2. Short Answer Questions

10 x 5 = 50

- a. 50-year-old male came in medicine OPD with chief complaint of swelling in joint of great toe. On biochemical laboratory investigations, physician noticed the increased serum uric acid. Physician diagnosed him to be suffering with gout. Explain the metabolic pathways steps along with enzymes that is affected in above patient with its biochemical correlation.
- b. Explain acid base disorders with their compensatory mechanism
- c. Applications of recombinant DNA technology
- d. A 60-year-old male is admitted in medicine ICU with complaints of increased micturition and abdominal pain. He was known case of chronic kidney disease (CKD). Describe different tests which can be performed in above patient for the measurement of glomerular filtration rate (GFR).
- e. Define replication. Write a note on DNA repair mechanism
- f. Free radicals and antioxidants
- g. Write the features of primary and secondary dehydration
- h. Quality control in clinical laboratory
- i. Describe the disorders of heme synthesis
- j. ~~Balanced diet and specific dynamic action~~

Q3. Long Answer Questions

3 x 10 = 30

- a. A 45-year-old man had acute pain in the right abdomen. He was diagnosed with gall stones
- What are the various types of jaundice? Which type of jaundice do gall stones cause
 - What investigations can be done in the blood and urine to find out the severity and type of jaundice
 - What is the relationship of cholesterol in bile to development of gall stones? Why do bile acids help to prevent development of gall stones
- b. A 5-year-old child with chief complaints of acute onset of pain both lower limbs and past history of painful episodes of abdomen, upper limb presented to casualty. He is pale and febrile. On examination spleen is palpable and icterus is present. History reveals he is known case of sickle cell disease.
- What is the etiopathogenesis of sickle cell disease
 - Explain polymerization of HbS in deoxygenated state
 - Explain electrophoresis findings in sickle cell disease
 - Enlist the complications of sickle cell disease
- c. Describe the process of protein synthesis in prokaryotes. How does it differ from protein synthesis in eukaryotes
