

# M.B.B.S. 1<sup>st</sup> Prof.

(New Scheme w.e.f. 2019 admission onwards)

BF/2022/06

## Biochemistry – B

M.M. : 100

Time : 3 Hours(First30 Min. for MCQs)

- Note: 1. **Use OMR Sheet to answer Multiple Choice Questions(MCQs).**  
2. Attempt all questions. Illustrate your answers with suitable diagrams  
3. **NO SUPPLEMENTARY SHEET SHALL BE ALLOWED/PROVIDED**  
4. **The student must write O.P. Code in the space provided on OMR Sheet and the Title page of the Answer Book.**

Q.1 **MCQs** (Attempt on OMR sheet) [1x20]  
Tick the most appropriate answer:

- Frameshift mutation results from:
  - Substitution of a single base
  - Deletion of a single base
  - Addition of a codon
  - Deletion of a codon
- Immune response is suppressed by:
  - Natural killer cells
  - Helper T cells
  - Regulatory T cells
  - B cells
- The end product of purine metabolism in human is:
  - Xanthine
  - Uric acid
  - Urea
  - Allantoin
- Which hemoglobin derivative is normally found in blood?
  - Deoxyhemoglobin
  - Sulfhemoglobin
  - Acid hematin
  - Cyanmethemoglobin
- The ration of plasma bicarbonate to carbonic acid is:
  - 5:1
  - 10:1
  - 20:1
  - 40:1
- An increase in serum unconjugated bilirubin occurs in:
  - Hemolytic jaundice
  - Obstructive jaundice
  - Defect in intestinal absorption
  - Glomerulonephritis
- Retention of sodium in the body leads to:
  - Water retention
  - Potassium retention
  - Water loss
  - Potassium loss
- Chaperons are the molecules required during:
  - Protein folding and translocation
  - DNA repair
  - Post-transcriptional modifications
  - None of the above

9. Kwashiorkor usually occurs in :
- The post weaning period
  - Pregnancy
  - Lactation
  - Old age
10. Extracellular matrix has:
- Same composition in all the tissues
  - No interaction between the ground substance and cellular components
  - A stable inert structure
  - The composition to suit the biochemical and mechanical properties of the tissues
11. A 10 year old child presents with history of rashes self mutilation family history positive. Which of the following investigation do you think may be suggestive of valuable for diagnosis?
- Lead
  - Alkaline phosphatase
  - LDH
  - Uric acid
12. Ehler-Danlos syndrome results in abnormal crosslinks among tropocollagen molecules. Individuals affected with this anomalous condition possess abnormal collagen fibers that result in hypermobile joints and hyperextensive skin. It can occur due to deficiency of:
- Neuraminidase
  - Lysyl hydroxylase
  - Iduronidase
  - G6PD
13. Respiratory quotient after heavy carbohydrate meal is:
- 1.2
  - 0.8
  - 1.0
  - 0.7
14. DNA replication is:
- Conservative
  - Non-conservative
  - Semi-conservative
  - None
15. A person was admitted in coma. Analysis of the arterial blood gave the following values : pCo<sub>2</sub> 16mmHg, HCO<sub>3</sub><sup>-</sup> 5mmol/L and PH7.1. What is the underlying acid base disorder?
- Metabolic acidosis
  - Metabolic alkalosis
  - Respiratory acidosis
  - Respiratory alkalosis
16. Cushing's syndrome (overactivity of the adrenal cortex) may be diagnosed by:
- Hypokalaemia
  - Hyperkalaemia
  - Hyponatraemia
  - Hypernatraemia
17. During DNA replication, '5'-GTCAAT-3' strand produces a new complementary DNA strand with the following structure:
- 5'-CAGTTA-3'
  - 5'-ATTGAC-3'
  - 5'-ACACCG-3'
  - 5'-GCCAAC-3'
18. Detection of Bence Jones protein (a non-blood protein) in urine is diagnostic importance in case of:
- Multiple myeloma and myelogenic osteosarcoma
  - Typhoid fever
  - Thalassaemia
  - AIDS

19. Tubular maximum (TmG) for glucose:

- a. 180 mg/dl
- b. 280 mg/dl
- c. 350 mg/dl
- d. 450 mg/dl

20. Which of the following is an anticancer drug:

- a. Zidovudine
- b. 6-mercaptopurine
- c. Allopurinol
- d. Acyclovir

Q.2. An eight year old boy is brought to the OPD with complaints of swelling around the eyes and ankles. The urine was frothy. On examination pedal edema was observed. Routine investigations showed:

S. protein: 5.9 gm/dL  
S. albumin: 2.2 gm/dL  
Cholesterol: 329 mg/dL  
Urine protein: +++

- a. What is the most probable diagnosis in this case? Justify.
- b. What is the biochemical role of albumin in blood?
- c. What is the biochemical basis of hypercholesterolemia in this case? [4x3]

Q.3. Write short notes on:- [5x4]

- a. Describe features of the genetic code.
- b. Differentiate between glycoproteins and proteoglycans.
- c. Enumerate the clinical significance of any five nucleotide analogues.
- d. Explain the role of tumor suppressor genes in cancer.

Q.4. Explain why:- [3x5]

- a. Hypocalcemia occurs in pancreatitis
- b. Steatorrhea is observed on obstructive jaundice
- c. Anemia occurs in lead poisoning
- d. Negative nitrogen balance is observed in cancer
- e. Anion gap is high in diabetic ketoacidosis

Q.5. Write short notes on:- [6x3]

- a. Explain the biochemical tests performed to assess liver function
- b. Describe gene regulation in eukaryotes
- c. Differentiate between primary and secondary immune response

Q.6. Write short notes:- [5x3]

- a. Describe the different blood buffers
- b. Explain the biochemical significance of glycemic index
- c. What is the ideal method of breaking bad news to a patient's relative?

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