

001/25

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
October - November 2025

Subject: Biochemistry**Paper: II****Full Marks: 100****Time: 3 hours**

Attempt all questions. The figures in the margin indicate full marks.

1. A 15 year old high school boy had difficulty in performing his work in dim light. Dietary history revealed that he thrives on fast food like noodles, cakes and biscuits. Based on the history, 1+1+2+3+(4+4)
 - i) What is your probable diagnosis?
 - ii) Name the biochemical compound which may be deficient in the above condition.
 - iii) What is the recommended daily allowance of it for children and adults?
 - iv) Mention the different functions of this compound.
 - v) Explain the aforementioned clinical condition. Describe the cycle associated with the compound with diagram.
2. Explain the following statements: 5×3
 - i) Topoisomerase inhibitors work as antibacterial and anticancer agents.
 - ii) P₅₃ is known as "Guardian of genome" as well as "Guardian of cell."
 - iii) Renal calculi are formed in hyperparathyroidism.
 - iv) Blue light phototherapy is effective in neonatal jaundice.
 - v) Telomerase is involved in aging process and cancer.
3. Short questions(applied aspect): 4x5
 - i) Define xenobiotic. Explain the role of Cytochrome P450 in Xenobiotic mechanism. 2+3
 - ii) Glycemic index: Its relevance in Diabetes and Obesity. 3+2
 - iii) Effect of folic acid deficiency on pregnant mother and developing foetus. 3+2
 - iv) Name the proteins related to iron absorption and transport mentioning function of each one. 2+3
4. Short notes: 3×6
 - i) Post translational modification of protein with example of their function.
 - ii) Immunoglobulin M: Structure and functions.
 - iii) Tumor markers and their importance.
5. Write short notes on the following: 4x5
 - i) RNA Interference
 - ii) Frame shift mutation and its consequences.
 - iii) Role of Self directed learning for medical students.
 - iv) Types of Hypersensitivity reaction.
6. Choose the correct option among each of the following: 12x1
 - i) A 65 year old man presents with fatigue, recurrent infections and back pain. Serum electrophoresis reveals a M spike, urine shows light chains that precipitate at 50 degree centigrade and redissolves on boiling. What is the most likely biochemical finding?
 - a) Bence Jones proteinuria
 - b) IgG deficiency
 - c) IgA Hypergammaglobulinemia
 - d) Hypocomplementemia
 - ii) A 60 year old woman with frequent fractures and back pain is found to have vitamin D level of 8ng/ml. What is the likely diagnosis?
 - a) Osteomalacia
 - b) Osteoporosis
 - c) Osteogenesis Imperfecta
 - d) Paget's disease

- iii) A 2 year old child is brought with poor weight gain, pedal edema and distended abdomen. He was weaned early and fed on carbohydrate rich porridge with little protein. What is the most likely diagnosis?
- a) Marasmus b) Celiac disease c) Nephrotic syndrome d) Kwashiorkor
- iv) A young boy came with ulceration, extensive pigmentation and wrinkling of skin of face and arms. His family complains of severe sun sensitivity of the boy even within minutes of exposure. The following is true for the boy:
- a) It is a defect of Nucleotide excision repair and autosomal dominant in nature.
 b) It is a defect of Mismatch repair and autosomal recessive in nature.
 c) It is a defect of Nucleotide excision repair and autosomal recessive in nature.
 d) It is a defect of Mismatch repair and autosomal dominant in nature.
- v) The following is true for an enzyme that synthesizes bond during protein synthesis:
- a) Needs energy as GTP b) A ligase type of enzyme
 c) Is a ribozyme and part of 30S sub unit in prokaryotes
 d) Is a ribozyme and part of 50S sub unit in prokaryotes
- vi) A patient receiving antiviral therapy for HIV infection undergoes periodic testing to monitor viral load. Which test is appropriate in this case?
- a) Western blot b) RT-PCR c) Quantitative PCR(qPCR) d) RFLP
- vii) A 5 year old boy with a family history of Duchenne muscular dystrophy is being evaluated for carrier status. Which test is most suitable to detect deletion in the dystrophin gene?
- a) Southern blot with dystrophin probe b) ELISA
 c) Microarray d) Real time PCR
- viii) All are true regarding structure of DNA except:
- a) High GC content has high melting temperature b) Z DNA has major and minor groove
 c) B-DNA has right handed helix d) Deoxyribose binds with phosphate
- ix) The specialized structures located at the ends of the eukaryotic chromosomes related to aging are called:
- a) Terminators b) Telomeres c) Stop signal d) Terminal sequence
- x) A 10 year old boy presented with tremor, slurred speech, psychiatric disturbance. On examination, Kayser Fleischer rings were visible around corneas. The following may be true about his underlying condition:
- a) Low serum iron with low ferritin
 b) Raised bilirubin and hepatic enzymes
 c) Abnormally low ceruloplasmin, raised bilirubin and hepatic enzymes
 d) Low ferritin, low ceruloplasmin with abnormal KFT
- xi) If glycine is replaced by serine at every third position of collagen alpha chain, the strength of collagen wall will:
- a) Increase
 b) Decrease
 c) Remain unaffected
 d) Increase in some types of collagen, but decrease in some types of collagen
- xii) Regarding Kwashiorkor, all are true except:
- a) Oedema and hypoalbuminemia are always associated
 b) Liver is shrunken
 c) Serum zinc, iron, vitamins are low
 d) Ineffective and improper weaning is one of the risk factors