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The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
February – March 2026

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

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

1. A 5 year old child was admitted to the hospital with symptoms of diphtheria, a disease caused by Corynebacterium diphtheriae. It is known that diphtheria toxin inhibits the translation process.
   i) State the mechanism of action of diphtheria toxin in inhibiting the translation process.
   ii) Name two other inhibitor of translation process in bacteria.
   iii) Enumerate the different post translational modification process.
   iv) Describe with the help of diagram initiation phase of translation in bacteria. 3+2+4+6

2. **Explain the following statements:** 5×3

   i) Vitamin B-12 deficiency is associated with increased excretion of methylmalonic aciduria.
   ii) Vitamin-E is a chain breaking antioxidant.
   iii) Cytochrome P450 is responsible for microsomal hydroxylation process.
   iv) DNA gyrase inhibitors can act as effective antibiotic against bacterial infection.
   v) Maturation of collagen is dependent on the vitamin-C status of the individual.

3. **Short questions (Applied aspect):** 4×5

   i) BMI is an index for assessment of nutritional status of the individual.
   ii) ELISA: Procedure and clinical importance.
   iii) CAMP (Cyclic AMP): Role as second messenger of hormone.
   iv) Diagnostic role of acute phase reactant proteins.

4. **Short notes:** 3×6

   i) DNA Polymerase in E.Coli.
   ii) Activation of post-oncogene to oncogene.
   iii) Role of cytochrome C in apoptosis.

5. **Write short notes on the following:** 4×5

   i) Wald's visual cycle.
   ii) Point mutation.
   iii) Doctor is a lifelong learner.
   iv) Classical pathway for activation of complement.

6. **Choose the correct option among each of the following :** 12×1

   i. A 52 year old woman undergoes a Thyroid scan. The scan shows a cold nodule with reduced iodine uptake in the right lobe. What is the most likely interpretation?
   a) Hypothyroidism b) Hyperthyroidism c) Thyroid malignancy d) Goitre

ii. Which one of the following enzymes has an intrinsic proof-reading activity?
a) DNA topoisomerase b) DNA helicase c) RNA polymerase d) DNA polymerase

iii. A patient with colorectal cancer is most likely to have elevated levels of:
a) Beta HCG b) CEA c) CA-125 d) AFP

iv. A person with Inflammatory Bowel disease underwent small bowel resection involving jejunum. Which of the following nutrient deficiency is expected?
a) Ascorbic acid b) Methyl cobalamin
c) Folic acid d) Iron

v. A body builder consumes whey protein to maintain muscle mass. What is the specific dynamic action of the protein diet?
a) 30% b) 20% c) 50% d) 40%

vi. A 3 year old child was brought to the clinic with severe sunburns even with brief sun exposure, and had developed multiple freckle-like spots on their face and arms. He had Photophobia and was observed squinting frequently. Most probable diagnosis is:
a) Xeroderma Pigmentosum b) Cockayne Syndrome
c) Cerebro-oculo-facio-skeletal (COFS) syndrome d) Rothmund-Thomson Syndrome

vii. A 45-year-old female presented with enlargement of thyroid gland and diagnosed with hyperthyroidism. What will happen to the Basal Metabolic Rate (BMR) in this case?
a) Increases b) Decreases c) Remains same d) Moderately High

viii. A 3 year old boy presented with failure to thrive, oedema and distended abdomen. Laboratory findings showed hypoalbuminemia and severe protein deficiency. The mother reports he is on predominantly carbohydrate diet. Which nutritional disorder is suggested by these features?
a) Kwashiorkor b) Marasmus c) Obesity d) Anorexia nervosa

ix. DNA replication occurs during which phase of the cell cycle?
a) S phase b) M phase c) G1 phase d) G2 Phase

x. A 33 year old second gravida delivered a male neonate, but the child has blue sclera, conductive hearing loss due to otosclerosis, high arched plate, scoliosis and hyperlaxity of ligaments and skin, multiple malunited fractures of bones. He may be suffering from:
a) Defective Type-1 Collagen b) Defective fibrillin c) Defective laminin d) Defective GAGs

xi. A 60 year old man with central obesity, moon face, hypertension has cortisol level that does not suppress with low dose dexamethasone. ACTH is low. The probable diagnosis is:
a) Cushing's syndrome b) Adrenal adenoma c) Adrenal carcinoma d) Ectopic ACTH production

xii. All newborns are administered intramuscular injection of Vitamin K shortly after birth to facilitate which of the clotting factor?
a) Factor VII b) Factor V c) Factor I d) Factor XI