The West Bengal University of Health Sciences
1st BMLT December, 2025 - January, 2026 Examination

Subject: Basic Biochemistry

Time: 3 hrs **Full Marks: 100**

*Attempt **all** questions*

1. Answer all questions : 20 x 1

a) Which among the following vitamins help in blood clotting?
i) Vitamin A. ii) Vitamin D. iii) Vitamin K. iv) Vitamin E.

b) Excessive intake of calcium in our diet results in which disorder?
i) Diarrhoea. ii) Kidney stone. iii) Constipation. iv) Stroke.

c) Gram equivalent weight per litre of solution of a substance is known as its :
i) Molality. ii) Molarity. iii) Normality. iv) Formality.

d) Potassium level in blood can be estimated by :
i) Flame photometer. ii) Colorimeter. iii) Incubator. iv) ELISA.

e) Phosporic Acid is an example of :
i) Triacidic base. ii) Tribasic acid. iii) Triacidic acid. iv) Tetrabasic acid.

f) Which of the following equipment is used to spin samples quickly to separate them based on density?
i) Autoclave. ii) Magnetic stirrer. iii) Incubator. iv) Centrifuge.

g) Which among the following is not a part of code of ethics in clinical lab?
i) Beneficience. ii) Respect for personse. iii) Maleficience. iv) Justice.

h) 500g of 5% w/w glucose is prepared by mixing :
i) 25g glucose and 475g water. ii) 25 ml glucose and 475 ml water.
iii) 5g glucose and 500g water. iv) 5 ml glucose and 500 ml water.

i) Which hormone is responsible for maintenance of calcium homoeostasis in body?
i) Insulin. ii) Cortisol. iii) Parathyroid Hormone. iv) Serotonin.

j) Beri-Beri is caused due to the deficiency of :
i) Niacin. ii) Ascorbic acid. iii) Riboflavin. iv) Thiamine.

k) Barfoed's solution is not reduced by :
i) Glucose. ii) Mannose. iii) Sucrose. iv) Ribose.

l) Hydroxyl group containing amino acid is :
i) Lysine. ii) Tryptophan. iii) Cystine. iv) Threonine.

m) The nitrogenous base present in lecithin :
i) Choline. ii) Ethanolamine. iii) Inositol. iv) Serine.

n) The protein part of enzyme is known as :
i) Holoenzyme. ii) Isoenzyme. iii) Apoenzyme. iv) Coenzyme.

o) β (1→3)glycosidic bond can be seen in :
i) Hyaluronic acid. ii) Cellulose. iii) Chitin. iv) Sucrose.

p) _____is the structural protein.
i) Hemoglobin. ii) Lecithin. iii) Collagen. iv) Insulin.

q) Myoglobin is a :
i) Protein with primary structure. ii) Protein with secondary structure.
iii) Protein with tertiary structure. iv) Protein with quaternery structure.

r) Disulphide bonds are formed between :
   i) Cysteine residues that are close together. ii) Cystine residues that are close together.
   iii) Proline residues that are close together. iv) Histidine residues that are close together.

s) This statement about enzymes is true :
   i) Enzymes accelerate reactions by lowering the activation energy.
   ii) Enzymes are proteins whose three-dimensional form is key to their function.
   iii) Enzymes do not alter the overall change in free energy for a reaction.
   iv) All of these.

t) Structural polysaccharides include :
   i) Cellulose, hemicellulose and chitin. ii) Cellulose, starch and chitin.
   iii) Cellulose, starch and glycogen. iv) Cellulose, glycogen and chitin.

2. Answer the following : 5 x 2
   a) Mention the different departments present in a clinical lab.
   b) What are the physiological buffers?
   c) What are the responsibilities of a clinical lab manager?
   d) Define mutarotation.
   e) How does a non-reducing sugar differ from a reducing one?

3. Write ***any six*** of the following : 6 x 5
   a) Pre analytical, analytical and post analytical errors.
   b) Vitamin A and Vitamin D (sources, RDA and biological functions).
   c) Calcium homeostatis.
   d) Confidentiality of reports.
   e) Principle and application of Flame Photometer.
   f) Structure of t-RNA.
   g) Heteropolysaccharides.

4. Answer ***any one*** of the following : 1 x 10
   a) Write a short note on colorimeter illustrating its working principle, maintenance and applications. Calculate the normality of a solution obtained by dissolving 6.3 g of hydrated oxalic acid in 250 ml water. 6+4
   b) Discuss about the Forces involved in stability of protein structure. Describe the structure of α-helix with suitable diagram. 5+5

5. Answer ***any two*** of the following : 2 x 15
   a) What is the normal level of iron in blood? Mention some dietary sources of iron. What are the biochemical functions of iron? Write a short note on iron absorption and transport and the factors affecting it. Explain any one disease associated with iron imbalance in the body. 1+1+3+7+3
   b) What are lab hazards? Mention some steps for prevention of lab hazards. Write a short note on lab first aid kit. Define molarity and molality with one formula of each. 2+5+5+3
   c) Discuss about saturated and unsaturated fatty acids with biological importance. Briefly describe the DNA structure proposed by Watson-Crick. 8+7