1. Write any three
   a) What is buffer? Describe various buffer systems for maintenance of acid base balance.
   b) Biological hazards in the clinical laboratory
   c) Various units of measurements
   d) Thin layer chromatography- principle, procedure and applications

2. Write any three
   a) First aid measures in the laboratory
   b) What are the differences in composition between plasma and serum with respect to various biochemical parameters?
   c) Write principle, types of electrophoresis. Write technique of paper electrophoresis and its application.
   d) Components, principle, applications of blood gas analyzer

3. Write any three
   a) Reference Material
   b) Chemical hygiene plan (CHP)
   c) Write the principle, types and application of centrifuges in the laboratory
   d) Poly acrylamide gel electrophoresis (PAGE)
4 Write any four
   a) Metabolic alkalosis and its compensatory mechanism
   b) Effect of strenuous exercise on specimen/s sample
   c) Role of kidney in acid base balance
   d) Commonly used urine preservatives
   e) Various anticoagulants used for sample collection