

- N. B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions out of remaining **six** questions.  
 (3) Figures to the **right** indicate **full** marks.  
 (4) Assume any **suitable** data wherever **needed**.
1. (a) What is Blood Cell Counter ? Explain with neat diagram. 5  
 (b) Explain the basic principle of spectrophotometer with suitable diagram. 5  
 (c) Explain the principle of transmission and reflection used in oximetry. 5  
 (d) Explain dye dilution method for cardiac output measurement. 5
  2. (a) Explain the evoked response audiometry system with suitable block diagram. 10  
 (b) Explain basic Audiometer, general requirements of audiometer and masking in audiometry. 10
  3. (a) What is Heart Lung Machine ? Explain its working with constructional diagram. 10  
 (b) What is Ventilator ? Explain the classification and controls of ventilators in detail. 10
  4. (a) Draw and explain diagram of  $pO_2$  and  $pCO_2$  electrode. 8  
 (b) Draw and explain the circuit diagram for computation of the following used in complete blood gas analyzer. 12  
     (i) Bicarbonate ( $HCO_3^-$ )  
     (ii) Total  $CO_2$   
     (iii) Base excess.
  5. (a) What is Spirometry ? What are the Parameters determined with spirometer ? Draw its block diagram and give clinical significance of parameters measured. 10  
 (b) What is Impedance Plethysmography? Explain any one type of it with clinical applications. 10
  6. (a) What is Colorimeter ? Explain block diagram of colorimeter with its applications. 10  
 (b) What is Autoanalyser ? Explain autoanalyser with its suitable diagram. 10
  7. Write short notes on (any **four**) :— 20  
     (a) Chromatography  
     (b) ELISA Reader  
     (c) Electrophoresis  
     (d) Florescence microscope  
     (e) Centrifuge.