1. 1.1. Describe the structural changes required to convert barbituric acid to an intravenous induction agent. (30%)

1.2. Outline the structural changes that occur in
   (a) Thiopentone (10%)
   (b) Midazolam (10%)
when given intravenously.
State the clinical relevance. (20%)

1.3. Describe the metabolism of the drugs mentioned in 1.2. (30%)

2. 2.1. Describe the changes in pharmacokinetics expected in
      (a) old age (35%)
      (b) renal dysfunction (35%)

2.2. State the modifications required when using morphine in renal dysfunction. Explain with reasons. (30%)

3. 3.1. Classify anticholine-esterases giving examples. (15%)

3.2. Describe the mechanism of action of neostigmine at the neuromuscular junction. (35%)

3.3. Explain how other pharmacological agents alter the action of non depolarizing muscle relaxants? (50%)
PART B – PHYSIOLOGY (BOOK ‘B’)

1.  
   1.1. Explain the systolic and diastolic functions of the heart. (30%)
   
   1.2. Draw a graph to show the left ventricular dynamic pressure volume relationship (25%)
   
   1.3. Describe with appropriate graphs the changes that occur to the above mentioned (1.2) relationship with increasing:
       
       (a) preload (15%)
       (b) contractility (15%)
       (c) afterload (15%)

2.  
   2.1. List the functions of the placenta. (30%)
   
   2.2. Describe the factors that affect oxygenation of the fetus. (70%)

3.  
   3.1. 
       (a) Draw a diagram to illustrate the cellular mechanism of hydrochloric acid formation in the stomach. (20%)
       (b) Describe the mechanism (60%)
   
   3.2. List the other substances secreted in the stomach indicating the relevant cells (20%)
1. What is an exponential process? (20%)

2. Describe exponential decay (20%)

3. Mention two instruments which exhibit exponential decay characteristic? (10%)

4. Describe the physical principles of the two instruments you mentioned in 1.3 (50%)

2. Describe the physical principles of transoesophageal Doppler ultrasonography in the measurement of cardiac output. (50%)

2.2. Outline the advantages and disadvantages of this method (30%)

2.3. List the other methods available to measure cardiac output (20%)

3. Write short notes

3.1. Temperature compensation in the modern TEC vaporizer (30%)

3.2. Skewed distribution (35%)

3.3. Hot water bath humidifier (35%)