

**Scheme – I**  
**Sample Question Paper**

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fourth  
**Course Title** : Analytical Equipment  
**Marks** : 70

22435

**Time: 3 Hrs.**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1) Attempt any FIVE of the following.**

**10 Marks**

- a) List any two applications of auto analyzer.
- b) State the meaning of sterilization.
- c) Define chromatography.
- d) Suggest the meter to measure hydrogen ion concentration in the given solution.
- e) Draw a neat labeled diagram of non dispersive infrared analyzer for carbon monoxide measurement.
- f) Suggest suitable sterilizing equipments for sterilization of medical forceps, scissors.
- g) Write the significance of temperature compensation in conductivity measurement.

**Q.2) Attempt any THREE of the following.**

**12 Marks**

- a) Draw block diagram of general elements of an analytical instruments & describe function of each block.
- b) Describe incinerator with a neat labeled block diagram.
- c) Draw neat circuit diagram for direct reading type conductivity meter.
- d) Following are the full scale measurement range for various gas pollutant. Suggest measurement technique for following pollutants.
  - i) Carbon monoxide – 0 – 50 ppm
  - ii) Hydrocarbons – 0 – 80 ppm
  - iii) Sulphar oxide – 0 – 2 ppm

iv) Nitrogen oxide – 0 – 1 ppm

**Q.3) Attempt any THREE of the following.**

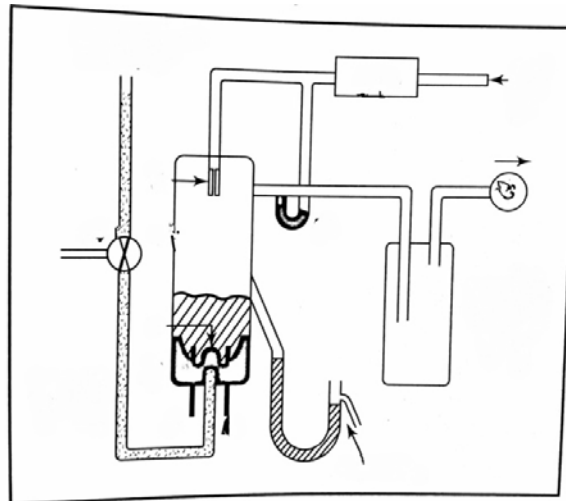
**12 Marks**

- a) Suggest sterilizing equipments used for following applications? Justify it.
  - (i) For removing micro dust, clots, and blood stains on the instrument.
  - (ii) For sterilizing medical waste.
- b) Describe working principles of electro conductive blood cell counter with a neat diagram.
- c) Draw labeled diagram for beat frequency method for measuring conductivity and give its working.
- d) List any four gas pollutants present in atmosphere and write its effect on health ( One effect of each pollutants ).

**Q.4) Attempt any THREE of the following.**

**12 Marks**

- a) Compare single beam spectrophotometer with dual beam spectrophotometer. (any four points)
- b) Explain hot air oven with a neat diagram.
- c) Describe gas chromatography with a neat labeled diagram.
- d) Explain the working of scanning electron microscope with neat diagram.
- e) Identify the following diagram used for measurement of pollutant and label it.



**Q.5) Attempt any TWO of the following.**

**12 Marks**

- a) State Beer Lambert's law. State its mathematical expression. List any two analytical Instruments based on Beer & Lambert's law.
- b) Draw labeled diagram of an autoclave .Describe its working. List any two applications of the same.
- c) Suggest the technique for separating ions or molecules that are dissolved in solvent and explain it with neat diagram.

**Q.6) Attempt any TWO of the following.**

**12 Marks**

- a) State two applications of the following analytical equipment.
  - i) Flame photometer
  - ii) Colorimeter
  - iii) Spectrophotometer
- b) Write significance of pH meter. Draw null detector type pH meter. Describe its working.
- c) List conductivity sensors for measuring conductivity. Describe direct method for conductivity measurement with a neat diagram.

**Scheme – I**  
**Sample Test Paper - I**

**Program Name : Diploma in Medical Electronics**

**Program Code : MU**

**Semester : Fourth**

**Course Title : Analytical Equipment**

**Marks : 20**

**22435**

**Time: 1 Hour**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) State Beer-Lambert's law.
- b) List any two analytical equipments.
- c) Draw labeled diagram of incinerator.
- d) Describe ultrasonic cleaner.
- e) Define centrifuge.
- f) List any two applications of auto analyzer.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Suggest sterilizing equipments used for sterilizing medical waste. State importance of sterilization
- b) List four applications of incinerator.
- c) Describe hot air Oven with a neat labeled diagram.
- d) Describe working of flame photometer with suitable diagram.
- e) Describe its working of colorimeter with a neat labeled diagram.
- f) List any four analytical equipments and write one application of each in detail.

**Scheme – I**  
**Sample Test Paper - II**

**Program Name : Diploma in Medical Electronics**

**Program Code : MU**

**Semester : Fourth**

**Course Title : Analytical Equipment**

**Marks : 20**

**22435**

**Time: 1 Hour**

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**Instructions:**

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR.**

**08 Marks**

- a) Define i) Chromatography ii) Electrophoresis
- b) State types of electronic microscope.
- c) State the working principle of PAGE.
- d) Draw neat labeled diagram of pCO<sub>2</sub> electrode.
- e) Write two specifications of capillary electrophoresis.
- f) Write the general equation for gas law.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Describe Null method for conductivity measurement with neat diagram.
- b) Draw a neat labeled diagram of Transmission Electron Microscope.
- c) Describe the Dark field blood cell counter to measure the amount of specified blood cell.
- d) Explain liquid chromatography with neat diagram.
- e) Describe beat frequency method for measuring conductivity with a labeled diagram.
- f) Draw diagram of automated wet-chemical air analysis.