

**Scheme - I**  
**Sample Question Paper**

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

22436

**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 four technical specification of digital blood pressure meter.
- b) Define any two respiratory parameters.
- c) State Beer Lambert law.
- d) List any four technical specification of Respiration Rate Meter.
- e) Identify the instrument in which right leg drive circuit is used and write it's importance.
- f) Mention any two possible faults which can occur in EMG machine and write remedies for it.
- g) State the concept of speech audiometer.

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

**12 Marks**

- a) Differentiate between direct and indirect blood pressure measurement techniques (any four).
- b) Describe the concept of fetal heart rate.
- c) Write four technical specifications of Phonocardiography.
- d) Draw block diagram of Bekesy audiometer and explain it.

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

**12 Marks**

- a) Suggest the instrument for measuring the volume of air inspired and expired by the lungs and explain the working principle of it.

- b) Describe the generation of ECG signal.
- c) Draw the preamplifier circuit of EEG.
- d) List any four technical specification of audiometer.

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

**12 Marks**

- a) Draw block diagram of ultrasonic FHR meter and give the function of RF oscillator in it.
- b) Suggest the method of recording the magnitude and direction of the electrical forces that are generated by the heart and describe it.
- c) Give any four technical specifications of EEG Machine.
- d) Describe generation of EMG signal.
- e) Choose the audiometer used for testing of the middle ear and explain it.

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

**12 Marks**

- a) Draw a block diagram of digital temperature meter and describe it.
- b) An ECG machine is received with following problems. State remedies to eliminate it.
  - 1. ECG trace too dark
  - 2. ECG trace too light
  - 3. ECG signal is noisy
  - 4. ECG baseline is shifting
  - 5. ECG trace not available
- c) Choose the instrument used to evaluate the electrical activity in the brain and give its principle of operation with neat diagram.

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

**12 Marks**

- a) Identify the instrument to measure the no-invasive blood pressure and explain the working of it.
- b) Explain unipolar and bipolar lead configurations for ECG with neat diagram.
- c) Describe the 10-20 electrode system with its neat sketch.

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

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fourth  
**Course Title** : Diagnostic Equipment  
**Marks** :20

22436

**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) Draw the blood pressure waveform and define Dicrotic notch.
- b) Write the normal value of healthy person for Heart rate and Respiration rate.
- c) State the Beer Lambert's law.
- d) List any four specification of digital temperature meter.
- e) Choose the instrument to measure oxygen saturation in blood and give its two technical specifications.
- f) Define any two respiratory volumes.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Draw the standard Spirogram.
- b) Compare direct and indirect blood pressure measurements.
- c) Explain systemic temperature and skin temperature.
- d) Choose the instrument for measurement of fetus heart rate and draw its block diagram.
- e) Write the technical specification of digital blood pressure meter with respect to following.
  - i) Pressure measurement range
  - ii) Display
  - iii) Power supply
  - iv) Measuring method
- f) Explain following methods of calculation of heart rate.
  - i) Average
  - ii) bit to bit

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

**Program Name** : Diploma in Medical Electronics  
**Program Code** : MU  
**Semester** : Fourth  
**Course Title** : Diagnostic Equipment  
**Marks** :20

22436

**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 Mark**

- a) List unipolar and bipolar leads.
- b) Define galvanic skin reflex.
- c) Draw the block diagram of EMG machine.
- d) Define air conduction.
- e) Draw the 10-20 electrode system.
- f) Write the importance of 1mV calibration circuit in ECG machine.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Explain four heart sounds generated by the heart with respect to its origin.
- b) State the steps for maintenance of ECG machine.
- c) Describe the generation of EMG signal.
- d) Draw the EEG Spectrum.
- e) Identify the instrument used for evaluating hearing acuity and give its four technical specifications.
- f) Write the specification of ECG machine with respect to following parameters.
  - i) Recording channels
  - ii) Printing speed
  - iii) Power
  - iv) Sensitivity