

**Scheme - I**

**Sample Question Paper**

**Program Name** : **Digital Electronics, Medical Electronics and Instrumentation**  
**Engineering Program Group**

**Program Code** : **DE/IE/IS/IC/MU**

**Semester** : **Third**

**Course Title** : **Electronic Instruments and Measurement**

**Marks** : **70**

22331

**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) Define the term 'Measurement'.
- b) Write the specifications of an analog multimeter.
- c) State significance of lissajous figure.
- d) Define Transducers.
- e) Sketch block diagram of Instrumentation system.
- f) State the applications of Bourdon Tube.
- g) List application of Data Acquisition System.

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

**12 Marks**

- a) Describe the different types of errors occurs in measurement with one example.
- b) Explain the role of shunt resistor connect across PMMC movement.
- c) Describe the function of each block of CRO.
- d) Explain with sketches the working principle of LVDT.

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

**12 Marks**

- a) Explain with sketches the working of analog ohm meter
- b) Calculate horizontal to vertical frequency ratio for Lissajous figures as shown in figure no.1

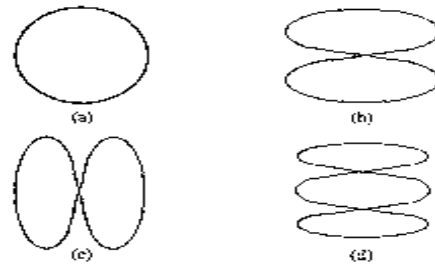


Figure no.-1

- c) Explain significance of transducer in instrumentation system.
- d) Sketch labeled DC signal conditioning circuits used for Pressure measurement

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

**12 Marks**

- a) Convert the PMMC movement into a dc-ammeter of the range 0 to 100mA.
- b) Sketch labeled equivalent circuit diagram of practical ammeter and voltmeter.
- c) Suggest instrument to measure unknown frequency above 5 MHz and store result. Justify it.
- d) Convert 520 mm of Hg into bar.
- e) Sketch AC signal conditioning circuit for level measurement.

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

**12 Marks**

- a) Determine the smallest measureable change in the voltage of an analog voltmeter having range 0-200V with resolution of 0.15% of full scale
- b) Sketch and describe pressure measurement system for 800mm pressure, that contain Bourdon tube and LVDT.
- c) Describe functions of the each block of DAS.

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

**12 Marks**

- a) Sketch the DC signal conditioning circuit for pressure measurement using strain gauge. Justify it.
- b) For the parameters accuracy, linearity and range, suggest the name of the temperature transducer to measure human body temperature. Justify it.
- c) (i) Calculate the resistance of PT-100 for 40°C.  
  
(ii) Sketch characteristics of PT-100 and compare it with that of thermocouple.

**Scheme - I**

**Sample Test Paper - I**

**Program Name** : Digital Electronics, Medical Electronics and Instrumentation  
Engineering Program Group  
**Program Code** : DE/IE/IS/IC/MU  
**Semester** : Third  
**Course Title** : Electronic Instruments and Measurement  
**Marks** : 20

22331

**Time: 1 Hour**

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**Instructions:**

- (1) All questions are compulsory.
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- (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) Differentiate analog and digital multimeter (any two points).
- b) Define the term measurement.
- c) List application of DSO.(any four)
- d) Define Resolution and accuracy.
- e) List type of Errors.
- f) State significance of Lissajous figure.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Identify the standards for calibration of the multimeter instrument with justification
- b) Describe error in measurement and classify it..
- c) List different display device and explain PMMC meter.
- d) Convert the PMMC with 100 ohm internal resistance with 10mA maximum deflection to 0- 10V range voltmeter.
- e) Compare DSO and CRO with four features.
- f) Sketch Block diagram of function generator and state function of each block.

**Scheme - I**

**Sample Test Paper - II**

**Program Name** : Digital Electronics, Medical Electronics and Instrumentation  
Engineering Program Group  
**Program Code** : DE/IE/IS/IC/MU  
**Semester** : Third  
**Course Title** : Electronic Instruments and Measurement  
**Marks** : 20

**22331**

**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 Transducer.
- b) Identify following transducer as active and passive
  - i) Thermocouple ii) LDR iii) LVDT iv) Bellows
- c) Sketch .Burdon Tube and Bellows schematic.
- d) List transducers used in level measurement.
- e) Define signal conditioning.
- f) State need of DAS.

**Q.2 Attempt any THREE.**

**12 Marks**

- a) Explain selection criteria of transducer.
- b) Sketch basic building blocks of instrumentation system and state function of each block.
- c) Explain working principle of orifice plate for flow measurement.
- d) Convert 1bar pressure to pascal, psi, Hg mm.
- e) Sketch pressure transducer system using DC bridge and instrumentation amplifier.
- f) Describe basic DAS with neat and labeled sketch.