

Code No: RT41025

R13

Set No. 1

IV B.Tech I Semester Regular Examinations, November - 2016

INSTRUMENTATION

(Open Elective)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define Accuracy with an example. [3]
- b) What is linearity of a transducer? Explain with an example. [4]
- c) What is strain? Explain. [3]
- d) What is a digital voltmeter? Explain the features. [4]
- e) Explain about vertical amplifier in CRO. [4]
- f) Write short notes on Q meters. [4]

PART-B (3x16 = 48 Marks)

2. a) Explain in detail about the dynamic characteristics of an instrument. [8]
- b) Define periodic and aperiodic signals. Explain the properties. [8]
3. a) Draw the resistance vs temperature graph of a thermistor and explain in detail. [8]
- b) Explain the construction of a capacitive transducer in detail. [8]
4. a) What are the different instruments that are used to measure torque? Explain about anyone. [8]
- b) What is angular velocity? Explain how it is measured. [8]
5. a) Draw the block diagram of continuous balance type digital voltmeters and explain. [8]
- b) What is meant by successive approximation? Explain its applications in digital voltmeters. [8]
6. a) What are the applications of CRO? Explain. [8]
- b) A CRO with a sensitivity of 10 V/cm is used. AC voltages of different magnitudes are applied to the y-input each time. Determine the AC voltages if the length of the straight lines observed are (i) 10 cm (ii) 20 cm [8]
7. a) What are the different types of Harmonic distortion analyzers? Explain. [8]
- b) Explain the working principle of RMS voltmeters in detail. [8]



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Set No. 2

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Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define Resolution with an example [3]
- b) What is meant by active transducer? Explain with an example. [4]
- c) Define gauge sensitivity with an example. [3]
- d) What are the advantages of digital voltmeters over analog meters? [4]
- e) Explain about horizontal amplifier in CRO. [4]
- f) What are the applications of Wave analyzers? [4]

PART-B (3x16 = 48 Marks)

2. a) What is an error? Derive the expression for error in measurements. [8]
- b) What is meant by sampling? Discuss about sampled data. [8]
3. a) Define gauge factor? Derive the expression for it. [8]
- b) Explain the construction of LVDT with the help of neat sketch. [8]
4. a) Draw the structure of a turbine flow meter and explain the construction. [8]
- b) What are the different instruments that are used to measure Vacuum? Explain about anyone. [8]
5. a) What is the basic principle of dual slope type digital voltmeter? Explain. [8]
- b) Explain in detail about the resolution and sensitivity of digital meters. [8]
6. a) Explain in detail about Sampling oscilloscope. [8]
- b) What is meant by Lissajous pattern? The Lissajous pattern on a CRO is stationary and has five horizontal and two vertical tangencies. The frequency of horizontal input is 1000 Hz. Determine the frequency of vertical input. [8]
7. a) Draw the block diagram of Heterodyne Wave analyzer and explain the operation. [8]
- b) Explain the working principle of Peak reading voltmeters with necessary waveforms. [8]



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Set No. 3

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INSTRUMENTATION

(Open Elective)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define Precision with an example. [3]
- b) What is dynamic range of a transducer? Explain with an example. [4]
- c) What are the different ways of measuring displacement? Explain. [3]
- d) Explain the terms half digit and over range. [4]
- e) Explain about trigger circuit in CRO. [4]
- f) What is meant by total harmonic distortion? Explain the significance. [4]

PART-B (3x16 = 48 Marks)

2. a) Explain in detail about the types of static errors. [8]
- b) What is meant by modulation? Explain in detail about modulation techniques. [8]
3. a) Explain the advantages and disadvantages of potentiometers. [8]
- b) What is a synchro? With the help of neat sketch explain the operation. [8]
4. a) What are the different instruments that are used to measure pressure? Explain about anyone. [8]
- b) Explain in detail about the working principle of magnetic flow meter. [8]
5. a) Draw the block diagram of Ramp type Digital voltmeter and explain. [8]
- b) Explain how phase angle is measured with the help of an example. [8]
6. a) What is a transient recorder? Explain in detail. [8]
- b) What is meant by Lissajous pattern? The Lissajous pattern on a CRO is stationary and has ten horizontal and four vertical tangencies. The frequency of horizontal input is 2000 Hz. Determine the frequency of vertical input. [8]
7. a) Draw the block diagram of a frequency selective wave analyzer and explain its operation. [8]
- b) Explain the working principle of vector impedance meters in detail. [8]

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Set No. 4

IV B.Tech I Semester Regular Examinations, November - 2016

INSTRUMENTATION

(Open Elective)

Time: 3 hours

Max. Marks: 70

Question paper consists of Part-A and Part-B

Answer ALL sub questions from Part-A

Answer any THREE questions from Part-B

PART-A (22 Marks)

1. a) Define Sensitivity with an example. [3]
- b) What is meant by passive transducer? Explain with an example. [4]
- c) What are the different ways of measuring velocity? Explain. [4]
- d) What is the function of sample and hold circuit? [3]
- e) What is meant by delay line in CRO? Explain. [4]
- f) Write short notes on Harmonic distortion. [4]

PART-B (3x16 = 48 Marks)

2. a) Explain in detail about the static characteristics of an instrument. [8]
- b) With an example, explain in detail about the pulse code modulation. [8]
3. a) What are the factors that should be considered while selecting a transducer? Explain. [8]
- b) With the help of neat sketch, explain in detail about Piezo electrical transducer. [8]
4. a) Explain the working principle of resistance temperature detector (RTD). [8]
- b) Explain in detail about the liquid level measurement with the help of an example. [8]
5. a) Explain the performance characteristics of Digital voltmeters. [8]
- b) Explain the working of a digital frequency meter with the help of a neat diagram. [8]
6. a) What is a data logger? Explain in detail. [8]
- b) A CRO is set to a time base of 0.2 ms/cm with 10 cm amplitude. Sketch the display of the pulse signal waveform with a pulse repetition rate of 1000 Hz and a duty cycle of 30%. [8]
7. a) Draw the structure of a basic wave analyzer and explain its operation. [8]
- b) What are the basic spectrum analyzers available? Explain. [8]

