DHANALAKSHMI SRINIVASAN ENGG. COLLEGE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGG.

SUBJECT CODE: EC 1351
SUBJECT NAME: MEASUREMENTS AND INSTRUMENTATION
SIXTH SEMESRER

UNIT I   BASIC MEASUREMENT CONCEPTS

(Part A questions)

1. What is measurement.
2. Define Accuracy.
3. Define precision.
4. Define resolution.
5. What are the types of drift.
6. Define sensitivity.
7. Define threshold.
8. Differentiate accuracy and precision.
9. What is scale span.
10. Define static response.
11. Define dynamic response.
12. What are the types of dynamic characteristics.
13. Define speed of response.
14. Define lag.
15. Define Fidelity.
16. Define Dynamic error.
17. Write the types of error.
18. Define limiting error.
19. What are derived units.
20. What is standard.
21. Write the different types of standard.
22. What is hysteresis.
23. Differentiate international and absolute standards.
24. Write the classification of static errors.
25. What is observational error.
26. What is instrumental error.
27. What is environmental error.

(Part B questions)

1. Explain the static characteristics.
2. Explain the dynamic characteristics.
3. Explain the dynamic inputs.
4. What are the types of errors. And explain them.
5. What are different types of standards.

6. Define a) precision. b) resolution c) sensitivity. d) threshold. e) Accuracy.
7. Explain systematic errors.
8. Write general expression for AC bridges.
9. Derive the quality factor expression for Hays Bridge.
10. Derive the quality factor expression for Maxwells Bridge.
11. Derive the quality factor expression for Anderson Bridge.
12. Derive the quality factor expression for Wein Bridge.
13. Derive the quality factor expression for Schering Bridge.
14. Write short notes on units.
15. Differentiate all types of standards.

UNIT II   BASIC ELECTRONIC MEASUREMENTS

(Part A questions)

1. Draw the block diagram general purpose CRO.
2. Draw the block diagram general purpose vertical amplifier.
3. State various front panel control of CRO.
4. Give the 2 types of delay line.
5. Which are the typical trigger sources.
6. What is the role of time base generator.
7. Why phosphor screen is provided with aluminium layer.
8. Give the characteristics of phosphor.
9. What is multimeter.
10. What is vector voltmeter.
11. What are the advantages of vector voltmeter.
12. What is true RMS meter.
13. Give the methods involved in true RMS meter.
14. Draw the block diagram of trigger generator.
15. What is TTL trigger mode.
16. What the block diagram of dual trace oscilloscope.
17. What the block diagram of dual beam oscilloscope.
18. Give the applications of CRO.
19. Give the advantages of sampling oscilloscope.
20. What is secondary emission.

(Part B questions)

1. Explain the front panel control of CRO.
2. Explain CRT with internal structure.
3. Explain vector voltmeter with neat block diagram.
4. Explain multimeter with neat block diagram.
5. Draw and explain the block diagram of dual trace oscilloscope.
6. Draw and explain the block diagram of dual beam oscilloscope.
7. Draw and explain the block diagram of types of dual trace oscilloscope.
8. Draw and explain the block diagram of mesh storage oscilloscope.

9. Draw and explain the block diagram of phospher storage oscilloscope.
10. Write short notes on sampling oscilloscope.
11. Write short note on powerscope.
12. Draw and explain the block diagram of digital read out oscilloscope.
13. Draw and explain the block diagram of high frequency oscilloscope.
14. Explain the use of CRO.
15. Write short notes on RF voltage measurement.
16. Write short notes on RF power measurement.

UNIT III   *SIGNAL GENERATORS AND ANALYZERS*

(Part A questions)

1. What is sweep generator.
2. Explain random noise generator.
3. Give the applications of frequency synthesizer.
4. On which factor the performance of beat frequency oscillator depends.
5. Give the various terminologies of pulse.
6. List the requirements of pulse generator.
7. Compare standard & modern signal generator.
8. What is real time spectrum analyzer.
9. What is FFT analyzer.
10. Draw the block diagram of sweep frequency generator.
11. Give the elements of a function generator.
12. What are signal sources.
13. Give the modes used in logic analyzer.
14. What is marker generator.
15. What is wobbluscope.
16. What is harmonic distortion.
17. Define distortion factor.
18. What is known as window in FFT analyzer.
19. Define total harmonic distortion.
20. Give the need of wave analysis.

(Part B questions)

1. Define and explain the following terms related to a spectrum analyzer: Frequency resolution, Sensitivity.
2. Draw and explain the block diagram of basic spectrum analyzer.
3. With the help of block diagram explain the operation of logic analyzer.
4. Draw and explain the block diagram of digital FFT analyzer.
5. Explain various application of spectrum analyzer.
6. With the help of block diagram explain the operation of heterodyne wave analyzer.
7. Explain the principle of operation of a wavemeter with the help of suitable diagrams.

8. With the help of block diagram explain the elements of a function generator.
9. Sketch the complete block diagram of a sweep frequency generator. Explain the operation of the instrument.
10. Sketch the block diagram and waveforms for a function generator.
11. With the help of block diagram explain the operation of Harmonic distortion analyzer.
12. With the help of block diagram explain the operation of RF signal generators.
13. With the help of block diagram explain the operation of types of RF signal generators.
14. Explain the principle of operation of a Sweep generators with the help of suitable diagrams.

UNIT IV   DIGITAL INSTRUMENTS

(Part A questions)

1. State the advantages of digital voltmeters.
2. Give the classification of digital voltmeters.
3. Compare the linear and staircase ramp techniques.
4. Compare various ADC techniques.
5. What is a vector voltmeter.
6. What is digital phase meter.
7. Give the atomic frequency standards.
8. Give the methods of input guarding.
9. Give various frequency and time standards.
10. What is conductively coupled interference.
11. Give the concept of ground loop.
12. Give the concept of ground loop interference.
13. Give the use of doubly shielded cables.
14. What is the function of gatye control flip flop.
15. What are the essential parts of a ramp type digital voltmeter.
16. What is the principle of ramp type digital voltmeter.
17. What are the additional features of individual digital multimeters.
18. What is the use of Schmitt trigger in digital frequency meter.
19. What is common mode voltage.
20. What is cesium beam resonator.

(Part B questions)

1. Explain the working principle of vector voltmeter with the help of a neat blopck diagram.
2. Draw and explain digital phase meter.
3. Explain the principles employed in phase meter.
4. Discuss atomic frequencystandards.
5. Explai the method of input guarding.
6. Explain with neat diagram, the working of servo potentiometric type DVM.

7. Explain with neat diagram, the working of successive approximation type DVM.
8. Explain with neat diagram, the working of linear ramp type DVM.
9. Explain with neat diagram, the working of staircase ramp type DVM.
10. Explain with neat diagram, the working of Voltage to frequency converter type integrating DVM.
11. Explain with neat diagram, the working of interpolating integrating DVM.
12. Explain with neat diagram, the working of potentiometric integrating type DVM.
13. Explain with neat diagram, the working of dual scope integrating type DVM.
14. State various specifications of DMM.
15. Draw ane explain the basic block diagram of DMM.

UNIT V DATA ACQUISITION SYSTEMS AND FIBER OPTIC MEASUREMENTS

(Part A questions)

1. What is IEEE 488 bus system.
2. What is data aqusition system.
3. Draw the diagram of optical power measurement.
4. What is LED.
5. Explain OTDR.
6. Define system loss.
7. Give the applications of OTDR.
8. Draw the block diagram of auto ranging poer meter.
9. Give the applications of LED.
10. Draw the cable construction.
11. Define numerical aperature.
12. Define refractive index.
13. Give the applications of fiber optical cable.
14. Give the advantages of fiber optical cable.
15. Give the disadvantages of fiber optical cable.
16. Write down the electrical characteristics of IEEE 488 bus.
17. Give the advantages of IEEE 488 bus.
18. Give the disadvantages of IEEE 488 bus.
19. Draw the block diagram for testing a radio receiver.
20. Draw the IEEE 488 bus structure.
21. What is multiplexing.

(Part B questions)

1. Explain ATE setup for testing signal generator.
2. Write short note on IEEE 488 bus.
3. Write short note on data aqusition system.
4. Explain computer based ATE.

5. With neat block diagram explain audio amplifier test setup.
6. Explain electrical, mechanical and functional specification of IEEE 488 bus.
7. Write note on LED.
8. Explain in detail the system loss.
9. Explain with neat diagram optical power measurement.
10. Write notes on OTDR.
11. Explain ray theory.
12. Draw and explain IEEE 488 bus structure.
13. Write notes on computer controlled instrumentation.
14. Explain DAC and ADC multiplexing in detail.
15. Explain the components in analog data aqusition system.
16. Explain the components in digital data aqusition system.