

AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS & COMMUNICATION

EC2351 MEASUREMENTS AND INSTRUMENTATION

MODEL QUESTION PAPER (SET-I)

Year:III

Time : Three hours

Sem:VI

Maximum : 100 marks

Answer ALL questions

PART A — ($10 \times 2 = 20$ marks)

1. Mention the significance of measurements.
2. Compare Moving coil with Moving iron instruments.
3. Draw the internal structure of CRT and list its functions.
4. What are the two significant problems with diodes when used for RF rectification?
5. What is Barkhausen Criteria for sustained oscillation?
6. Draw the block diagram of spectrum analyzer.
7. What are the advantages of digital instruments over analog instruments?
8. What are the different types of Digital Voltmeter?
9. Draw the block diagram of Digital Data Acquisition System.
10. What are the key features of fully automatic digital instruments?

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) What is the need for standards of measurements? How they are classified? Explain (8)
(ii) How the unknown frequency is measured using Wien bridge method? (8)

Or

- (b) (i) What are the different types of errors in measurement? Explain. (8)
(ii) How do you measure the unknown inductance using Hay's Bridge? (8)

- 12.(a) (i) Explain the types of storage oscilloscope with a neat block diagram. (16)

Or

(b) (i) Discuss the measurement of DC and AC voltages and currents using an Electronic Multimeter. (8)

(ii) Draw the block diagram of True RMS reading voltmeter and explain its operation. (8)

13. (a) (i) Explain how function generator generates sine wave, triangular wave and square wave. (8)

(ii) Draw the block diagram of sweep-frequency generator and explain. (8)

Or

(b) (i) What is wave analyzer? How it analyzes the harmonics? Explain. (8)

(ii) Explain the vector network analyzer and list its application. (8)

14. (a) (i) How computer controlled measurement system is used for testing radio receiver? (8)

(ii) What is virtual instrument? List the advantages of virtual instrument over conventional instrument (8)

Or

(b) (i) With necessary diagrams explain Ramp type digital voltmeter. (8)

(ii) Draw the block diagram of digital frequency meter and explain. (8)

15. (a) (i) What are the factors to be considered while interfacing transducers to electronic control and measuring systems? (10)

(ii) Explain data loggers(6)

Or

b. Explain the working operation of

(i) optical time domain reflectometer(6)

(ii)Auto ranging power meter(10)

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EC2351 MEASUREMENTS AND INSTRUMENTATION
MODEL QUESTION PAPER(SET-II)

Year:III

Time : Three hours

Sem:VI

Maximum : 100 marks

Answer ALL questions

PART A — ($10 \times 2 = 20$ marks)

1. A set of independent current measurements were recorded as 10.03,10.10,10.11,10.08.Calculate the range of an error.
2. How is international standard of length is defined?
3. Compare analog storage oscilloscope with digital.
4. What is the function of an electron gun?
5. Define sweep
6. What is intermodulation distortion?
7. Why Schmitt trigger is used in digital frequency meter?
8. Draw the block diagram of Integrated DVM
9. What is the need for data loggers’
10. List the elements of digital data acquisition’

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Explain the working operation for PMMC & derive it’s torque equation. (8)

(ii) Explain the types of errors (8)

Or

(b) (i) What are the conditions for bridge balance? (8)

(ii) How do you measure the unknown inductance using Maxwell’s Bridge & also draw the phasor diagram? (8)

12.(a) (i) Draw the block diagram of sampling oscilloscope and explain the principle. (8)

(ii) How to measure large Capacitors& small coils using Q-meter. (8)

Or

(b) (i) Explain vector impedance meter with a neat block diagram(8)

(ii) How to measure RF voltage & power using RF millivoltmeter? (8)

13. (a) (i) Explain RF signal generator. (8)

(ii) Draw the block diagram of Digital spectrum analyzer and explain. (8)

Or

(b) (i) Explain frequency selective wave analyzer?

(ii) How the fundamental frequency is suppressed using fundamental suppression distortion analyser. (8)

14. (a) (i) Explain how to extend the frequency range of counter?(8)

(ii) How to make automatic polarity indication & automatic ranging in digital instrumentation(8)

Or

(b) (i) With necessary diagrams explain types of digital voltmeter. (16)

15. (a) (i) With neat diagram explain the Shaft encoders(8)

(ii) Draw the block schematic representation of the IEEE 488 instrumentation bus and explain it.(8)

Or

b. Explain the following

i. A/D multiplexing(5)

ii. D/A multiplexing(5)

iii. Isolation amplifier(6)

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EC2351 MEASUREMENTS AND INSTRUMENTATION

MODEL QUESTION PAPER(SET-III)

Year:III

Time : Three hours

Sem:VI

Maximum : 100 marks

Answer ALL questions

PART A — ($10 \times 2 = 20$ marks)

1. What are random errors?
2. Define dynamic error.
3. What are the various sources of errors in Q-Meter?
4. What is known as fluorescence?
5. What are the causes of distortion?
6. What is resolution in FFT spectrum analyzer?
7. What is offset current error?
8. What is the need for period measurements?
9. Why ATN line is used?
10. What is meant by talker, listener, controller?

PART B — ($5 \times 16 = 80$ marks)

11. (a) (i) Explain the working operation for moving iron instruments & derive it's torque equation. (8)

(ii) Explain the types of Static characteristics (8)

Or

(b) (i) How do you measure the unknown inductance using Schering Bridge & also draw the phasor diagram? (8)

(ii) How do you measure the unknown inductance using Anderson Bridge & also draw the phasor diagram? (8)

12.(a) Draw the block diagram of general purpose oscilloscope and explain the principle. (16)

Or

(b) Explain vector meters with a neat block diagram(16)

13. (a)(i) Draw the block diagram of Digital RLC meter and explain. (6)

(ii) Explain the sweep frequency generator(10)

Or

(b) Explain the different types of frequency synthesizer(16)

14. (a) Explain Audio amplifier & radio receiver with a neat block diagrams(16)

Or

(b) With necessary diagrams explain automation in digital instruments. (16)

15. (a) (i).How signal is transmitted in a microprocessor systems(16)

Or

(b) . Explain the Instruments used in computer controlled instrumentation(16)

EC 2351 MEASUREMENTS AND INSTRUMENTATION

UNIT I BASIC MEASUREMENT CONCEPTS

2 MARKS

1. What is mean by measurement?
2. What are the main functional elements in measurement system?
3. How are instruments classified?

4. Define static error.
5. Define accuracy.
6. Define sensitivity.
7. Define dead time.
8. What is environmental error?
9. What are random errors?
10. Define dynamic error.

16 MARK QUESTIONS

1. Discuss different type of Standards of measurement. Classify and explain the different type of Standards of measurement.
2. Discuss basic characteristics of measuring devices.
3. Define and explain with example examples the different types of possible errors in measurement.
4. With neat diagram explain the construction, working, torque equation and advantages , disadvantages of PMMC instrument.
5. Explain any one bridge circuit for measurement of inductance.

4. With neat diagram explain the construction, working, torque equation and advantages , disadvantages of PMMC instrument.
5. Explain any one bridge circuit for measurement of inductance.

UNIT II BASIC ELECTRONIC MEASUREMENTS

2 MARKS

1. What are the main parts in CRO?
2. What is the purpose of time base generator?
3. Define deflection sensitivity.
4. What is known as fluorescence?
5. Explain split beam method.
6. What are the two types of delay line used?
7. What is dual trace CRO?
8. What is Q factor?
9. What is a sampling oscilloscope?
10. What is the purpose of time base circuit in a CRO?
11. What are the applications of Q meter?
12. What is vector impedance meter?
13. Define deflection sensitivity.
14. What are the various sources of errors in Q-Meter?

16 MARK QUESTIONS

1. Explain the main parts in CRO.
2. Explain the main parts in CRT.
3. Explain with block diagram of Sweep frequency generator.
4. Explain with block diagram of dual beam oscilloscope.

5. Explain with block diagram of dual trace oscilloscope.
6. Explain the working principle of a vector voltmeter with the help of a neat block diagram.
7. With a neat block diagram explain the function of a general purpose oscilloscope.
8. Explain different types of power measurement.

UNIT III SIGNAL GENERATORS AND ANALYZERS

2 MARKS

1. What is an oscillator?
2. What is known as duty cycle?
3. Define Rise time, fall time.
4. Define droop.
5. Define rounding.
6. Define pulse width.
7. Define pulse period.
8. What is a sweep frequency generator?
9. What are the causes of distortion?
10. What is resolution in FFT spectrum analyzer?

16 MARK QUESTIONS

1. Explain how power is measured in an optical fiber.
2. Explain with block diagram of Optical time domain reflectometer.
3. Explain the wave analyzer.
4. Draw and explain the working of Digital multimeter
5. Explain the Instruments used in computer controlled instrumentation
6. Describe the working of function generator with the a block diagram .

2 MARKS

1. What is analog instrument?
2. What is digital instrument?
3. What is DVM?
4. What is known as quantization?
5. What is known as quantization error?
6. How is DC current measured in digital multimeter?
7. What is offset current error?
8. What is the need for period measurements?

16 MARK QUESTIONS

1. Explain with neat diagram.
 - (i) Single slope ADC
 - (ii) Successive approximation ADC
2. Draw the Circuit diagram for n bit binary weighted resistor DAC & obtain an expression for output voltage.
3. Write short note on Flash type ADC.
4. Explain with block diagram, the operation of ramp type DVM.
5. Draw and explain the circuit diagram of Digital frequency meter.

UNIT V DATA ACQUISITION SYSTEMS AND FIBER OPTIC MEASUREMENTS

2 MARKS

1. What is meant by data acquisition?
2. What is a multiplexer?
3. What are the two types of MUX operation?
4. What you mean by ATE?
5. What is IEEE 488 bus system?
6. Why ATN line is used?
7. What is meant by talker, listener, controller?
8. What are the three layers in OFC?

16 MARK QUESTIONS

1. With the help of block diagram explain the data acquisition system.
2. With the help of block diagram explain analog to digital multiplexing.
3. Explain with block diagram the automatic test system to analyse an audio amplifier & radio receiver.
4. How signal is transmitted in a microprocessor based measurement?
5. Explain the sequence of operations in an IEEE 488 bus system.

