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Question Paper Code : 11340

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Sixth Semester

Electronics and Communication Engineering

EC 2351/EC 61/EI 1306 — MEASUREMENTS AND INSTRUMENTATION

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A set of independent current measurements were recorded as 10.03, 10.10, 10.11 and 10.08 A. Calculate the range of an error.
2. How is the international standard of length defined?
3. Compare and contrast analog and digital storage oscilloscopes.
4. Distributed capacitance of a coil is measured by changing the capacitance of the tuning capacitor. The value of the tuning capacitor are C_1 and C_2 for the resonant frequencies f_1 and $2f_1$. What is the value of the distributed capacitance?
5. In a sweep frequency generator, two oscillators one with frequency range of 3 GHz to 5 GHz is hetrodyned with a second oscillator having a fixed frequency output of 3 GHz. How the output frequency varies?
6. What is intermodulation distortion?
7. Why Schmitt trigger is used in digital frequency meter?
8. Draw the block diagram of integrating type DVM.
9. List the elements of digital data acquisition system.
10. What is the need for data loggers?

PART B — (5 × 16 = 80 marks)

11. (a) (i) How to convert the PMMC meter into a voltmeter and ammeter? How to extend the range of these meters? (8)

(ii) Explain the types of error with an example. (8)

Or

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

(ii) How to measure the unknown inductance using Maxwell's LC Bridge? Draw the phasor diagram also. (8)

12. (a) (i) Draw the block diagram of the sampling oscilloscope. How does the sampling oscilloscope increase the apparent frequency response of an oscilloscope? (8)

(ii) How to measure large capacitors and small coils using Q-meters. (8)

Or

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

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

13. (a) (i) Draw the block diagram of the frequency divider type of signal generator with frequency modulation and explain. (8)

(ii) What are the basic elements of function generator? Explain how to generate the square wave, triangular wave and sine wave using function generator. (8)

Or

(b) (i) Explain the working of frequency selective wave analyzer with neat block diagram. (8)

(ii) How the fundamental frequency is suppressed using the fundamental suppression distortion analyzer? (8)

14. (a) (i) Draw the block diagram of a multiplexed display used in a frequency counter and explain. (8)

(ii) Explain how to extend the frequency range of the counter. (8)

Or

(b) (i) How to make automatic polarity indication and automatic ranging in a digital instrument? (8)

(ii) Explain the need for virtual instrument with an example. (8)

15. (a) (i) Draw the schematic of an isolation amplifier and explain the need for isolation amplifier in interfacing transducers. (8)

(ii) With neat diagrams explain the digital to analog multiplexing. (8)

Or

(b) (i) Explain the IEEE 488 electrical interface system. (8)

(ii) How to measure the power using optical instrument? Draw the auto ranging power meter and explain. (8)