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15/11/16 AN

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Question Paper Code : 60461

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Electronics and Communication Engineering

EC 2351/EC 61/10144 EC 602 — MEASUREMENTS AND INSTRUMENTATION

(Regulations 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out the various standards of measurements.
2. Mention the errors in moving coil meters.
3. Compare CRO and DSO.
4. What is True RMS?
5. A signal has a fundamental component with a rms value of volt. Second, third and fourth harmonics have rms values of 1,0.5 and 0.3 volts. Find the harmonic distortion.
6. Compute the value of self capacitance of a coil when the following measurements are made : at frequency $f_1 = 2$ MHz, the tuning capacitor is set as 450 pF. When the frequency is increased to 5 MHz. the tuning capacitor is tuned at 60 pF.
7. Why Schmitt trigger is used in digital frequency meter?
8. Draw the block diagram of integrating type DVM.
9. What is the importance of sample and hold circuit in digital data acquisition system?
10. List any four factors which affect the propagation of light through optical sensors.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Enumerate the main static characteristics of measuring instruments and explain. (8)
- (ii) A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHz was recorded as 532, 548, 543, 535, 546, 531, 532, 536. Calculate the Arithmetic mean, Average deviation and Variance. (8)

Or

- (b) (i) Explain the construction of a moving coil meter with relevant diagram and obtain the expression for deflection of the coil. (8)
- (ii) A capacitance of 200 pF produces resonance with a coil at a frequency of $2/\pi \times 10^6$ Hz, while harmonic of this frequency resonance is produced by a capacitance of 40 pF. Calculate the self capacitance of the coil, inductance of the coil. (8)
12. (a) Discuss in detail about the function of delay time base oscilloscopes with neat diagram. (16)

Or

- (b) With neat diagram explain in detail about the function of following measurement system.
- (i) Vector meter (8)
- (ii) Q meter. (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) With a neat functional block diagram and schematic explain the working of digital multimeter. (16)

Or

- (b) (i) What is computer controlled instrumentation? Explain its role in data acquisition systems. (8)
- (ii) Write short notes on virtual instrumentation. (8)

15. (a) (i) Describe the multiplexing techniques in data acquisition of systems. (8)
- (ii) Explain the IEEE 488 bus with a neat diagram. (8)

Or

- (b) (i) Explain the elements of a digital data acquisition system. (8)
- (ii) How to measure the power and system loss using fiber optic techniques? (8)
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