Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91414

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Sixth Semester

Electronics and Communication Engineering

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

(Regulation 2008/2010)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish precision from accuracy for an instrument.

2. Write the principle of an ac bridge, used for the measurement of unknown capacitors.

3. What are the advantages of digital storage oscilloscope?

4. Why special meters are required for measurement of Q factor?

5. Define harmonic distortion and the equation for finding out distortion factor.

6. How do you overcome the disadvantage of a sweep generator by a marker generator?

7. What are termed as Universal Counters? What is the logic circuitry behind them?

8. Write down the assumptions behind virtual instruments. Mention their merits and demerits.

9. Give a skeletal block diagram of the elements of a digital data acquisition system.

10. The IEEE 488 bus defines what type of devices that may be connected on the general purpose interface bus.

PART B — (5 × 16 = 80 marks)

11. (a) In a survey of 15 owners of a certain model of a car, the following figures for average diesel consumption were reported. Find the mean value, median value, standard deviation and the variance 29.2, 29.6, 29.5, 28.9, 25.5, 30.00, 30.3, 30.5, 31.1, 31.2, 31.4, 33.00, 31.7, 31.8, 32.0.

Or

(b) (i) Calculate the unknown inductance and resistance measured by Hay's Bridge. The bridge elements at the balancing condition are $R_1 = 5.1\ k\Omega$, $C_1 = 2\mu F$, $R_2 = 7.9\ k\Omega$, $R_3 = 790\ \Omega$ and the supply angular frequency is 1200 rad/sec. (10)

(ii) Explain any other bridge used for the measurement of self inductance in terms of a standard capacitor. (6)

12. (a) Discuss the important specifications of an electronic multimeter. Analyse with suitable diagrams how it is used for making measurements.

Or

(b) Analyse the salient features of a sampling oscilloscope? How does it differ from a conventional oscilloscope in maintaining the image quality?

13. (a) Enlist the various applications of spectrum analyser along with the description of its working.

Or

(b) What are the main requirements of sine wave signal generator in instrumentation? Also explain with suitable block diagrams how an AF sine square generator works.

14. (a) How is the testing of an audio amplifier done with computer controlling? The typical automatic data system requires what essential components.

Or

(b) Write a detail note on 'Lab view system', its capabilities as used in a virtual instrumentation lab.

15. (a) In computer controlled instrumentation how does a frequency counter modified and interfaced with IEEE 488 bus.

Or

(b) Write notes on :

(i) Data loggers.

(ii) Optical time domain reflectometer.

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