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Question Paper Code : 41406

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fifth Semester

Electronics and communication Engineering

E 11306 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define static error, resolution and sensitivity.
2. State the limitations of Maxwell's bridge.
3. List the applications of cathode ray oscilloscopes.
4. Draw the diagram of Q meter.
5. State any two applications of spectrum analysers.
6. Write the function of frequency synthesizer.
7. Compare analog and digital technique.
8. Draw the diagram of any one type of DVM.
9. State the reasons for losses in optical fibers.
10. Write the advantages of digital instruments over analog instruments.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Derive the balance equations for Hay's bridge.
(ii) Explain the construction and working of a permanent magnet moving coil voltmeter.

Or

- (b) (i) A moving coil instrument has following data : Number of turns = 100; width of coil = 20mm, depth of coil = 30mm, flux density in air gap 0.1 Wb/m^2 . Calculate the deflecting torque when carrying a current of 10 mA. Also calculate the deflection if spring constant is $2 \times 10^{-6} \text{ Nm/degrees}$.
(ii) Derive equations for deflecting and controlling torques of moving iron instruments.

12. (a) (i) Explain the thermal method of RF power measurement with a suitable schematic.
(ii) Explain how RF power may be measured with a Bolo meter bridge.

Or

- (b) Explain with suitable derivations how distribution capacitance may be measured with a Q meter.
13. (a) With a block diagram explain the construction and working of a typical function generator.

Or

- (b) With a schematic explain the working of a Harmonic distortion analyzer.
14. (a) Discuss in detail
(i) Frequency counters
(ii) Multimeters

Or

- (b) Explain the various kinds of errors in measurements with digital frequency meter and suggest remedies to overcome each type of error.
15. (a) With a neat diagram explain the various functional elements of a digital data acquisition system.

Or

- (b) (i) Explain the working theory of optical time domain reflectometer.
(ii) Explain the important features of IEEE 488 bus.
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