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Question Paper Code : 23375

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

Fourth Semester

Electronics and Communication Engineering

EC 1255/EC 1351 – MEASUREMENTS AND INSTRUMENTATION

(Regulation 2004/2007)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the static characteristics of a measurement system.
2. Based on the function and application, how the standards of measurements is categorised.
3. What are the different types of amplifiers used for CROS?
4. How to measure the phase and frequency using CRO?
5. What is Barkhausen criteria for production of oscillations?
6. What is intermodulation distortion?
7. What are the advantages of digital instruments over analog indicating instruments?
8. In the time interval and period measurements what do you mean by trigger level error?
9. List the characteristics of the instrumentation amplifier.
10. How to test on audio amplifier?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the working of repulsion type moving iron instrument with the help of neat diagrams. Why these meters can be used on both ac and dc? (8)
- (ii) A circuit was tuned for resonance by eight different students, and the values of resonant frequency in KHZ were recorded as 532, 548, 543, 535, 546, 531, 543 and 536. Calculate the arithmetic mean, deviation from mean, average deviation and standard deviation. (8)

Or

- (b) (i) Draw the block diagram of the true rms-reading voltmeter and explain how it measures complex waveforms. (8)
- (ii) Derive the expression for frequency measurement with the Wein Bridge. (8)
12. (a) (i) How vector voltmeter measures the voltage at high frequencies? (8)
- (ii) Draw the simplified block diagram of the sampling oscilloscope. How it measures high frequency waveforms. (8)

Or

- (b) (i) How the RF power and voltage is measured using RF millivoltmeter? (8)
- (ii) Explain how the parallel connection of Q-meter is used to measure small capacitors and high value resistors. (8)
13. (a) (i) Which applications requires sweeping source of frequency? Draw the wide band sweep generator and explain. (8)
- (ii) Draw the block diagram of a heterodyne wave analyzer. What are the applications of wave analyzer. (8)

Or

- (b) (i) How the model signal generator works with a frequency counter display, an isolation amplifier and an ALC system? (8)
- (ii) Brief any four applications of spectrum analyzer. (8)

14. (a) (i) Draw the block diagram of RAMP-type digital voltmeter with voltage-to-time conversion using gated clock pulses and explain. (8)
- (ii) How to generate a square wave and square pulse using laboratory square-wave and pulse generator? (8)

Or

- (b) (i) Explain the working principle of Digital Multimeter. (8)
- (ii) Draw the logic diagram of a time base for frequency counter and explain how time base is useful in frequency measurement. (8)
15. (a) (i) What is the need for voltage-to-frequency converter and frequency to voltage converter in a transducer interfacing circuits? Explain. (8)
- (ii) Draw the schematic of IEEE 488 instrumentation bus system and list its important features. (8)

Or

- (b) (i) Draw the block diagram of optical-time domain reflectometer and explain. (8)
- (ii) Explain the counter-type Analog to Digital Converter with multiplexed input. (8)
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