

8. Write short notes on the following :

- (a) Q meter
- (b) Wave analyzer
- (c) Instruments used in computer controlled instrumentation.

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[05 - 3219]

III/IV B.E. DEGREE EXAMINATION.

~~Second Semester~~

Electronics and Communication Engineering

Elective-I (4) — ELECTRONIC MEASUREMENTS
AND INSTRUMENTATION

(Effective from the admitted batch of 2006-2007)

Time : Three hours

Maximum : 70 marks

Question 1 is compulsory.

Answer any FOUR from 2 to 8.

1. (a) Define the following terms giving one example for each :
 - (i) Significant figures
 - (ii) Accuracy and
 - (iii) Precision
- (b) Compare analog and digital meters.
- (c) What would a true-RMS reading meter indicate if a pulse waveform of 5 volts peak and a 25 percent duty cycle were applied?

- (d) What is the resolution of a $4\frac{1}{2}$ digit voltmeter?
- (e) Draw the block diagram of a wave meter.
- (f) Explain the principle of RF power meter.
- (g) (i) Name the different controls used in a CRO.
(ii) Give the basic concept of a dedicated automatic test system (ATS).
2. (a) Explain how statistical analysis is used in limiting errors.
(b) What are the disadvantages of transmitting time and frequency standards by high frequency, 3–30 MHz, radio? What are some of the methods used to improve the dissemination of these standards?
(c) A set of independent current measurement was taken by 5 observers and recorded as 12.8 mA, 12.2 mA, 13.1 mA, 12.9 mA and 12.4 mA. Calculate
(i) the arithmetic mean
(ii) the average deviation from mean
(iii) standard deviation and
(iv) probable error.
3. (a) Explain the operation of vector impedance meter with neat sketches.
(b) Bring out the important differences between an analog multimeter and a digital multimeter. Discuss their uses.
4. (a) Explain the principle of operation of a rectifier type A.C. voltmeter. List their errors.
(b) Explain the construction and principle of operation of PMMC meters.
5. (a) Explain in detail the principle of operation of a sampling oscilloscope.
(b) Draw the block diagram of a general purpose CRO and explain the function each block.
6. (a) Why are wave meters used? Explain its working.
(b) Explain the operating principle of spectrum analyzer.
(c) Explain the operating principle of frequency meter.
7. (a) Discuss the merits and demerits of automatic test systems compared to conventional systems.
(b) Describe with an example the signal handling and timing in a microprocessor based instrumentation system. State its advantages.