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Paper Id: 131423 **Roll No.** [redacted]

B. TECH
(SEM. IV) THEORY EXAMINATION 2017-18
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections.
2. Assume any missing data.

SECTION A

1. Attempt *all* questions in brief. 2 x10 = 20

a. Determine the dimensions of force, work, energy and power.
b. Define accuracy and precision with suitable example.
c. What is the principle of ramp type digital voltmeter?
d. Explain rise time and fall time with neat diagram.
e. Name the bridge circuits used for the measurement of self inductance.
f. What are the criteria for balance of a Wheatstone bridge?
g. Why triggering is needed in CRO?
h. List the main parts of CRT.
i. What are the advantages of digital instruments over analog instruments?
j. What are the different calibration methodologies?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Explain different types of errors that may occur in measurements. Differentiate between gross errors and systematic errors. List a few ways of minimizing the effect of errors in measurement.
b. Explain multimeter probes. What are the two methods of measuring current using high current probes of multimeter?
c. Define the Q-factor of a coil. Explain with a circuit diagram the construction and principle of operation of a basic Q-meter?
d. Draw the basic block diagram of an oscilloscope and state the function of each block.
e. On what factors does the frequency of instrumentation calibration depend? Explain how A.C. voltmeter calibration can be done.

SECTION C

3. Attempt any one parts of the following: 10 x 1 = 10

a. Describe the principle of operation, advantages, disadvantages and application of PMMC.

b. Describe the principle of operation and use of Galvanometer in detail with suitable diagram.

4. Attempt any one parts of the following: 10 x 1 = 10

a) Draw and explain the block diagram of the Ramp Type DVM with its system waveform. Compare digital and analog Multimeter.
b) Draw and explain the block diagram of a digital frequency meter system in detail.

5. Attempt any one parts of the following: **10 x 1 = 10**

a) State various methods of measurement of low resistance. Why ammeter-voltmeter methods not suitable for the precise measurement of low resistance?

b) Derive an expression for finding unknown resistance and Inductance for Maxwell Bridge.

6. Attempt any one parts of the following: **10 x 1 = 10**

a) Describe with block diagram the operation of a digital storage CRO (DSO). State the function of each block. Also write its applications.

b) Explain CRO probe and Sampling Oscilloscope in detail with suitable diagram.

7. Attempt any one parts of the following: **10 x 1 = 10**

a) Describe with the help of a block diagram the operation of a X-Y recorder. Also list the application of X-Y recorder.

b) Draw and explain the circuits for calibration of d.c. voltmeter and wattmeter with standard instruments.