B. Tech.
(SEM. VI) EXAMINATION, 2006-07
ELECTRONICS MEASUREMENT & INSTRUMENTATION

Time : 2 Hours] [Total Marks : 50

Note : Attempt all questions.

1 Attempt any four parts of the following : 4×4=16
   (a) Define and explain briefly the static performance parameters of instruments.
   (b) A source having an open circuit voltage of 20V and an output impedance of \((1.5 + j4) \Omega\) is connected through a transmission netork of impedance \((0.5 + j1) \Omega\). What should be the load impedance so that the maximum power will be delivered to it? Calculate the maximum deliverable power.
   (c) Derive the equations for capacitance and dissipation factor of a low voltage Schering bridge. Draw the phasor diagram of the bridge under conditions of balance.
   (d) Explain the function and working of Wagner Earth Device.
   (e) Describe the phenomenon of synchronisation of vertical input signal to sweep generator in CRO.
   (f) Discuss delayed sweep in CRO.

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2 Attempt any four parts of the following: 4x4=16

(a) Write a technical note on loading effects of instruments.

(b) Explain with the help of a block diagram, the various parts of an electronic multimeter.

(c) Describe the methods of measurement of voltage and power at radio frequencies.

(d) What are the various factors, taken into consideration while selecting an electronic type analog voltmeter.

(e) A saw tooth voltage has a peak value of 40V and a time period of 5.0 second as shown in figure below.

\[ \text{Fig. 1} \]

Calculate the error when measuring this voltage with an average reading voltmeter, calibrated in terms of rms value of sinusoidal waves.

(f) Describe the circuit diagram and operation of a d.c. voltmeter using a direct coupled amplifier.

3 Attempt any two parts of the following: 4.5x2=9

(a) Describe the working of an inter modulation distortion meter with the help of a block diagram.
(b) What are different types of distortions caused by amplifiers?
(c) Describe the basic circuit of a spectrum analyser.

4 Attempt any two parts of the following: 4.5x2=9
(a) Explain frequency measurement using Schmitt trigger with the help of a diagram.
(b) Sketch the block diagram for time interval measurement mode of operation using DDAs and DCAs.
(c) Explain operation of digital phase meters with the help of block diagram.