Total No. of Questions : 11 Total No. of Printed Pages : 4

EK-180

B.E. VIIth Semester (CGPA) Examination, 2016

Electronics & Commun. Engg.

Paper - EL-701

Electronics Measurement & Instrumentation

Time : 3 Hours] **[Maximum Marks : 60**

Note :- Attempt all the questions. Each question carries equal marks.

1. (a) Why is damping rquired for an electromechanical measuring instrument ?
   (b) Why is scale of MI instrument calibrated non-linearly ?
   (c) What is the difference between analog and digital frequency meter ?
   (d) Which instrument can used be to measure non-sinusoidal voltage ?

P.T.O.

(e) What is the major cause of creeping error in an energy meter ? 5×2

2. (a) Derive the torque equation of a moving iron instrument ?
   (b) Sketch and explain the working of moving-coil instrument. 5×2

OR

(a) Discuss a method for measurement of low resistance.
(b) Expain the operation of a Wagner's earthing device. 2×3

3. (a) Derive the errors of CT and PT, and discuss its preventives.
   (b) Discuss about ac bridge used for measurement of capacitance. 5×2

OR

(a) Discuss about a galvanometer which is used for measurement of frequency.
(b) How is the voltmeter calibrated with DC potentiometer ?

4. What is the use of LVDT / Discuss its basic principle of operation and also discussed. How are the frequency and phase measured in CRO. 5×2

OR

(a) Draw the block diagram of an electronic voltmeter and explain its operation.

(b) Write short notes on any **two** :-

(i) Owen's bridge

(ii) Digital frequency meter

5. (a) What is the requirement of "Screening of bridge components" ? Draw the circuit diagram of Wagner's earthing device and explain its operation.

(b) Define the sensitivity of a strain gauge. Draw the criciut for measurement of strain and derive the expression of output voltage in terms of strain. 5×2

OR

(a) Derive the torque equation of moving iron instrument and comment on the shape of the scale.

(b) Prove that for electrodynamometer type wattmeter ture power = {cos Φ [cos Φ cos (Φ – β)]} x actual wattmeter reading Where cos Φ power factor of

the circuit $\beta = \tan^{-1} (\omega L/R)$ where L and R are the inductance and resistance of the pressure coil of the circuit.

6. (a) Describe the construction and principle of operation of D' Arsonval type Galvanometer.

(b) Discuss the major sources of errors in current transformer. What are the means to reduce errors in CT ? Explain design and constructional feature to reduce the error. 5×2

OR

(a) Describe the measurement of frequency, phase angle and time delay using oscilloscope with suitable diagrams and mathematical expressions.

(b) With block diagram explain the operation of "Ramp type' digital voltmeter.

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