H.T.No. | | | | | | | | | | |

Code No: EE1518 **GEC-R14**

II B. Tech II Semester Supplementary Examinations, December 2017

ELECTRICAL MEASUREMENTS & INSTRUMENTATION

(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

Note: All Questions from **PART-A** are to be answered at one place.
Answer any **FOUR** questions from **PART-B.** All Questions carry equal Marks.

PART-A

6 × 2 = 12M

1. A PMMC ammeter has a coil of dimensions 15mm X 12mm. The flux density is1.8×10^{-3}Wb/m^2 and the spring constant is 0.14×10^{-6} N-m/rad. Determine the number of turns required to produce an angular deflection of $90^0$when a current of 5mA is flowing through the coil.
2. How the range of wattmeter can be extended?
3. What are the applications of CRO?
4. What are the different types of DVM's?
5. What are the classifications of Transducers?
6. Draw the circuit diagram of DC Crompton's Potentiometer.

PART-B

4 × 12 = 48M

1. a) Describe how the phase difference between two waveforms of same frequency can be measured with CRO. (6M)

   b) Explain about the vertical amplifier used in a CRO. (6M)

2. a) Discuss the construction of attraction type moving iron instrument and also derive an expression for deflecting torque. (6M)

   b) The coil of a moving coil voltmeter is 40mm long 25mm wide has 90 turns on it. The control spring has a torque of 240×10^{-6} N-M when deflection is 100 divisions on full scale. If the flux density of the magnetic field in the air gap is 1Wb/m^2, Estimate the resistance that must be put in series with the coil to give one volt per division. (6M)

3. a) Explain the theory and principle of operation of a single phase energy meter. (6M)

   b) Explain about the errors and compensations in dynamometer type Wattmeter. (6M)

4. a) Explain about the suitable method for measuring high resistance? (6M)

   b) A single range student type potentiometer has an 18 steps dial switch where each step represents 0.1V. The dial resistors are 10Ω. The slide wire of the potentiometer is circular and has 11 turns and a resistance of 11Ω each. The slide wire has 100 divisions and interpolation can be done to one-fourth of a division. The working battery has a voltage of 6.0V and negligible internal resistance. Calculate

i) The measuring range of potentiometer

ii) The resolution

iii) Working current. (6M)

5. a) What are the advantages and disadvantages of capacitive transducers? (6M)

   b) Explain the principle of operation of a Piezo – Electric transducer. (6M)

6. a) Draw and explain the block diagram of Digital frequency meter. (6M)

   b) Explain about working of Successive approximation DVM with neat block diagram. (6M)

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