

A

Reg. No. :

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

**Question Paper Code: 54306**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Fourth Semester

Electrical and Electronics Engineering

15UEE406- ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. An ammeter of 0-25 A range has a guaranteed accuracy of 1% of full scale reading. The current measured is 5 A. The limiting error is CO1- R  
(a) 2.5%                      (b) 2%                      (c) 5%                      (d) 4%
2. A meter with a resistance of 100  $\Omega$  and a full scale deflection of current of 1 mA is to be converted into voltmeter of 0 - 5 V range. The multiplier resistance should be \_\_\_\_\_ ohm CO1- R  
(a) 4900                      (b) 490                      (c) 5100                      (d) 5000
3. Wattmeter cannot be designed on the principle of CO2- R  
(a) Electrostatic instrument                      (b) Thermocouple instrument  
(c) Moving iron instrument                      (d) Electrodynamometer instrument
4. An instrument transformer is used to extend the range of CO2- R  
(a) Induction instrument                      (b) Electrostatic instrument  
(c) Moving coil instrument                      (d) All of the above
5. To avoid the effect of stray magnetic field in A.C. bridges we can use CO3- R  
(a) Magnetic screening                      (b) Wagner earthing device  
(c) Wave filters                      (d) Any of the above

6. Murray loop test can be used for location of \_\_\_\_\_ CO3- R
- (a) Ground fault on a cable (b) Short circuit fault on a cable  
(c) Both the ground fault and the short-circuit fault (d) None of these
7. CRO is used in a radar for \_\_\_\_\_ CO4- R
- (a) Studying the pattern of flights  
(b) Measuring voltage  
(c) Visualizing a target  
(d) Determining the distance between source and destination
8. Typically oscilloscope represents \_\_\_\_\_ CO4- R
- (a) Current and time (b) Resistance and time  
(c) Voltage and time (d) Power and time
9. Process of physical deformation on application of electric field is described by \_\_\_\_\_ CO5- R
- (a) Electrostriction property (b) Electro mechanical property  
(c) Magnetostriction property (d) Electromagnetic property
10. In piezoelectric strain transducer voltage developed is \_\_\_\_\_ to strain applied. CO5- R
- (a) Directly proportional (b) Equal  
(c) Independent (d) Inversely proportional

PART – B (5 x 2= 10 Marks)

11. Compare Resolution and precision. CO1- R
12. Why the ordinary wattmeter's are not suitable for low power factor circuits? CO2- R
13. Which bridge is used to measure incremental inductance? Write the expression. CO3- R
14. List the basic components of a tape recorder. CO4- R
15. Classify the any four types of Analog to Digital converter. CO5- R

PART – C (5 x 16= 80 Marks)

16. (a) Draw and explain the block diagram of generalized instrumentation System. CO1- U (16)

Or

- (b) Compose the Normal or Gaussian curve of errors in the study of random effects. CO1- U (16)
17. (a) Describe the construction and working of permanent magnet moving coil instrument. Also derive the expression for deflection. CO2-U (16)

Or

- (b) Describe the constructional and working of an induction type wattmeter. Also derive an expression for the average torque which is proportional to power. CO2-U (16)
18. (a) Draw the diagram of Co-ordinate type A.C. potentiometer and explain its working principle. CO3-U (16)

Or

- (b) Explain how the inductance is measured in terms of known Capacitance using Maxwell's bridge. Compose the conditions for balance. CO3-U (16)
19. (a) Explain the Dot matrix printer working and sketch the construction layout. CO4- U (16)

Or

- (b) Describe the direct and frequency modulation magnetic tape recording types. Give its merits and demerits. CO4 -U (16)
20. (a) Describe the piezo- electric transducer and give the formula for coupling coefficient. CO5- U (16)

Or

- (b) Express the performance parameters of Analog to Digital Converter? Explain any two basic A/D conversion techniques in detail. CO5- U (16)

