**A** **Reg. No. :** | | | | | | | | | | |

**Question Paper Code: 54306**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Fourth Semester

Electrical and Electronics Engineering

15UEE406- ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. Measurement close to true value is CO1-R

   (a) Accurate (b) Precise (c) Average (d) Error

2. The total quantity of electricity delivered in a particular time is measured by CO1-R

   (a) Absolute instrument (b) Indicating Instrument (c) Recording Instrument (d) Integrating Instrument

3. Input impedance of an electronic voltmeter is CO2-R

   (a) Low (b) High (c) Medium (d) Zero

4. Trivector meter is needed for measuring CO2-R

   (a) Active Power

   (b) Reactive Power

   (c) Active and Reactive Power

   (d) Active Power, Reactive Power and Total Energy

5. The principle on which a bridge circuit operates is CO3-U

   (a) null indication (b) ampere's rule (c) partial indication (d) kirchhoff's laws

6. Electrical system is grounded in order to protect CO3-R

   (a) Electrical equipments (b) Humans

   (c) Electrical Equipments & Humans (d) Transmission lines

7. CRO stands for CO4-R

   (a) Cathode Ray Oscilloscope (b) Current Resistance Oscilloscope

   (c) Central Resistance Oscilloscope (d) Capacitance Ray Oscilloscope

8. Focusing and accelerating anodes in CRT are CO4-U

(a) rectangular (b) cylindrical (c) spherical (d) square

9. A data acquisition system provides CO5-R

(a) partial communication (b) ineffective communication

(c) effective communication (d) complete communication

10. Output of smart sensors will be of CO5-R

(a) Analog (b) Digital (c) Analog and digital (d) Analog or Digital

PART – B (5 x 2= 10Marks)

11. Compare the terms precision and accuracy in measurements. CO1-U

12. Name the essential torques required for normal operation of a measuring instrument. CO2-R

13. Mention the applications of isolation amplifier. CO3-R

14. Write the principle used in dot matrix display. CO4-R

15. List the factors to be considered for the selection of transducers. CO5-U

PART – C (5 x 16= 80Marks)

16. (a) (i) Describe in detail about static and dynamic characteristics of measuring instruments. CO1-U (08)

(ii) Discuss the various errors in measurements and standards for calibration. CO1-U (08)

Or

(b) Describe the functional elements of a measuring instrument with block diagram in detail. CO1-U (16)

17. (a) Describe the construction, working of permanent magnet moving coil Instrument and derive the expression for deflection. CO2-U (16)

Or

(b) (i) Describe the basic magnetic measurements using B-H curve. CO2-U (08)

(ii) State the need for instrument transformer and explain its operating principle in detail. CO2-U (08)

18. (a) (i) Discuss in detail the electro-static and electro-magnetic interference. CO3-U (08)

(ii) Describe the importance of grounding. List the different grounding techniques available. CO3-U (08)

Or

| | | | | |
|---|---|---|---|---|
| | (b) | (i) Illustrate the measurement of low resistance using Kelvin's double bridge. | CO3-U | (08) |
| | | (ii) Derive an expression for measuring inductance using Maxwell's inductance bridge. | CO3-U | (08) |
| 19. | (a) | (i) Describe the construction and working of magnetic tape recorder. | CO4-U | (08) |
| | | (ii) Discuss the principle and working of CRT display. | CO4-U | (08) |
| | | Or | | |
| | (b) | With simplified block diagram, explain the construction and operating principle of general purpose Cathode Ray Oscilloscope. | CO4-U | (16) |
| 20. | (a) | List the different functional elements of data acquisition system and discuss their associated functions in detail. | CO5-U | (16) |
| | | Or | | |
| | (b) | Give the basic working principle and applications of<br>i. Piezo electric transducer.<br>ii. Hall effect transducer.<br>iii. Optical transducer.<br>iv. Digital transducer. | CO5-U | (16) |

**54306**