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Question Paper Code: 54306

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

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 CO5-U (16)
- i. Piezo electric transducer.
 - ii. Hall effect transducer.
 - iii. Optical transducer.
 - iv. Digital transducer.

