Register No.: ....   Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
(2020 SCHEME)

Course Code:	**20EET203**
Course Name:	**Measurements and Instrumentation**
Max. Marks:	**100** **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. Differentiate between the spring control and gravity control.
2. Why eddy current damping cannot be used for moving iron instrument?
3. Explain the effect of power factor on the readings of wattmeter in two wattmeter method.
4. Define the terms related to instrument transformer: i) Transformation ratio ii) Nominal Ratio.
5. Explain the bridge for measurement of low resistance.
6. Explain the measurement of flux in a ring specimen.
7. How luminous intensity can be determined using photo conductive transducer.
8. What is Maxwell's bridge? Derive the equation of balance for the bridge.
9. Discuss the working of a load cell.
10. Explain the digital frequency meter.

PART B
(Answer one full question from each module, each question carries 14marks)

MODULE I

11. a) Explain the construction and principle of operation of permanent magnet moving coil instrument. (8)
    b) Analyze gross error, systematic error and random error with examples. What are the methods for their elimination/reduction? (6)

OR

12. a) How the range of DC ammeter and DC voltmeter can be extended. Derive the expression to find the shunt resistance and multiplier resistance? (8)
    b) Discuss the deflecting, damping and controlling torque in an instrument. (6)

MODULE II

13. a) Derive the expression for Ratio and Phase angle error in a Current Transformer. (8)

    b) Explain the extension of range of wattmeter using instrument transformer. (6)

OR

14. a) Explain the construction and theory of a single-phase induction type energy meter. Show that number of revolutions in time 't' is proportional to energy supplied. (8)

    b) Narrate the construction and working principle of dynamometer type instrument. (6)

MODULE III

15. a) With the help of neat sketch describe the method of measurement of earth resistance. (8)

    b) Describe the working of hall effect sensors. (6)

OR

16. a) Discuss how the calibration of voltmeter, ammeter and wattmeter using DC potentiometer. (8)

    b) Derive the equations for balance in Schering bridge. (6)

MODULE IV

17. a) Explain the different types of temperature sensors. Compare RTD with thermistors. (8)

    b) Explain how hysteresis loop can be determined using step by step method. (6)

OR

18. a) Discuss the determination of iron losses by using Lloyd Fisher magnetic square method. (10)

    b) Define transducer and classify them. (4)

MODULE V

19. a) With a neat block diagram explain the working of a cathode ray oscilloscope and specify the function of each block. (10)

    b) Explain the operation of digital voltmeter with block diagram. (4)

OR

20. a) Write short notes on electromagnetic and ultrasonic flow meter. (8)

    b) With the help of neat sketch explain the working of LVDT. Also draw its characteristics. (6)

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