

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (S), MAY 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. What are the different standards of measurement?
2. List out the general requirements for ammeter shunts.
3. Explain any two errors that occur in electro-dynamometer type wattmeter and its compensation.
4. Explain the procedure to extend the range of ammeter using current transformer.
5. How frequency is measured using a Wien's bridge?
6. How high voltage is measured using the method of sphere gaps.
7. How to measure luminous intensity using photovoltaic cell.
8. Write short note on silicon temperature sensor.
9. Explain the basic principle and working of LVDT.
10. How strain is measured using a strain gauge?

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

11. a) If the true value of a shaft diameter is 1.605 inches and shaft is measured and found to be 1.603 inches. Determine both the absolute error and relative error. (8)
- b) Write short note on deflecting, damping and controlling torque with neat figures. (6)

OR

12. a) Draw the block diagram of a typical measurement system and indicate the functional elements in detail. (6)
- b) Explain the working of attraction type moving iron instrument with the help of neat diagram. (8)

MODULE II

13. a) Explain the working of induction type energy meter. (4)
- b) Explain the construction details and working of three phase wattmeter. (10)

OR

14. a) Compare current and potential transformer. (4)
b) Using circuit and phasor diagrams, explain the measurement of three phase power using two wattmeter method. What are the conditions of wattmeter readings under a) upf b) 0.866 pf and c) 0.5 pf. (10)

MODULE III

15. a) Derive the equations for balance in the case of Maxwell's inductance – capacitance bridge. (7)
b) Explain the working of a DC potentiometer with suitable diagram. (7)

OR

16. a) How high voltage is measured using electrostatic voltmeter? (6)
b) The arms of a four-arm bridge a, b, c and d supplied with sinusoidal voltage have the following values.
arm ab : A resistance of 800 Ω in parallel with a capacitance of 2 mF
arm bc : 400 Ω resistance (8)
arm cd : 1 k Ω resistance
arm da : A resistance R_2 in series with 2 mF capacitance
Determine the value of R_2 and frequency at which the bridge will balance.

MODULE IV

17. a) Discuss the determination of iron losses by using Lloyd fisher magnetic square method. (10)
b) Write short notes on thermistors. (4)

OR

18. a) Explain how BH curve can be determined using Ballistic galvanometer. (8)
b) Explain the working principle of thermocouple. (6)

MODULE V

19. a) Explain how CRO can be used to measure frequency and phase angle. (8)
b) Draw and explain the block diagram of virtual instrumentation system. (6)

OR

20. a) Explain the measurement of any non-electrical quantity employing load cell. (7)
b) Draw the block diagram of digital storage oscilloscope. Explain the three modes of operation (7)
