

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

**SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)**

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

**FIRST SEMESTER.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022****ROBOTICS AND AUTOMATION****(2021 Scheme)****Course Code: 21RA104-A****Course Name: Measurements and Sensors for Automation****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. Differentiate between reproducibility and repeatability of a measuring instrument.
2. Explain the significance of routine calibration in measuring instruments.
3. Discuss the working of a transducer. List the differences between active and passive transducers.
4. Compare laminar and turbulent flow on account of Reynold number.
5. Explain the working of a photomultiplier.
6. Write a short note on limit switches.
7. Explain the working of an amplifier using op amp circuit.
8. Define the term MEMS.

**PART B***(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. Explain Loading effect, Hysteresis and Noise of a measuring instrument. (6)

**OR**

10. Draw the general block diagram representation of a measurement system. Identify various elements and point out the functions performed by each element. (6)

**MODULE II**

11. Explain the dynamic response of a system and discuss its types. (6)

**OR**

12. Explain the significance of calibration. Classify different calibration procedures. (6)

**MODULE III**

13. Write a short note on proximity sensor. (6)

**OR**

14. Derive the expression for gauge factor for the measurement of resistance. (6)

**MODULE IV**

15. With constructional details state the working principle and governing laws of a thermocouple. (6)

**OR**

16. Describe constant current type and constant temperature type hot wire anemometer. (6)

**MODULE V**

17. Write short notes on (a) Electrochemical Cell (b) Electro ceramics (6)

**OR**

18. Elaborate on Magnetostrictive and Hall Effect sensor. (6)

**MODULE VI**

19. Explain the working of pneumatic load cell. (6)

**OR**

20. How the capacitance can be measured using AC bridge? (6)

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