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

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), DECEMBER 2023

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. Describe the classification of measuring instruments.
2. Define a) Speed of response b) fidelity.
3. Summarize the importance of Bath- Tub curve with figure.
4. Explain the working principle behind mass flow meter.
5. Define float type level detector.
6. Summarize the working of photomultiplier tube with neat figure.
7. Explain inverse transducer.
8. Define smart sensors and quote its applications.

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Define a) hysteresis b) linearity c) loading effect. (6)

OR

10. State the main performance characteristics of measuring instruments. (6)

MODULE II

11. Illustrate the dynamic characteristics of an instrument. Also, explain the frequency response of a first order system. (6)

OR

12. Define a) direct calibration b) indirect calibration c) routine calibration. (6)

MODULE III

13. Illustrate the classification of transducers with suitable examples. (6)

OR

14. a) Explain the working principle of strain gauge. (3)
    b) Define pneumatic transducer with neat figure. (3)

MODULE IV

15. With neat sketch explain the method used for vacuum measurement. (6)

OR

16. Define Reynold number. Explain the working of velocity flow meter. (6)

MODULE V

17. Outline purge method of level measurement. List its advantages. (6)

OR

18. a) Explain electrochemical cell with neat schematic. (3)
    b) Define polarization. (3)

MODULE VI

19. Rephrase the function of feedback pneumatic load cell. (6)

OR

20. Define a) MEMS b) Bio sensors. (6)

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