

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022

(2021 Scheme)

Course Code: 21MD204-F

Course Name: Measurement Systems in Engineering

Max. Marks: 60

Duration: 3 Hours

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

1. Define primary, secondary and tertiary measurement.
2. Elucidate about the reliability of an instrument.
3. Write a note on intelligent instruments.
4. Explain about the principle and types of thermocouples.
5. Narrate the working of Annubar tube.
6. Describe about positive displacement meters.
7. What are the two important uses of transmission electron microscope in materials science?
8. How does a spectrometer works?

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

9. Describe about zeroth, first and second order systems in measurement (6)

OR

10. Explain the various classifications of Measuring Instruments. (6)

MODULE II

11. a) The resistance of a certain size of copper wire is given as
 $R = R_0[1 + \alpha(T - 20)]$ where $R_0 = 6 \Omega \pm 0.3$ percent is the resistance at 20°C ,
 $\alpha = 0.004^\circ\text{C}^{-1} \pm 1$ percent is the temperature coefficient of resistance, and the temperature of the wire is $T = 30 \pm 1^\circ\text{C}$. Calculate the resistance of wire and its uncertainty. (3)
- b) Define Chi square test. (3)

OR

12. Enumerate the generalized procedure for conduct of scientific experiments. (6)

MODULE III

13. With appropriate diagram explain the working of Data Acquisition System. (6)

OR

14. Detail the elements of a microcomputer. (6)

MODULE IV

15. a) Compare an RTD and a Thermistor. (3)

- b) Give a short note on Foil-type heat flux gauge. (3)

OR

16. a) Using a schematic explain radiation pyrometer. (3)

- b) Explain about thin film heat flux sensor. (3)

MODULE V

17. a) Describe the working of Turbine flow meter. (3)

- b) Narrate the working of Coriolis meter. (3)

OR

18. a) Explain Doppler effect and working of ultrasonic flow meter (4)

- b) List the factors to be considered in the selection of flow meters. (2)

MODULE VI

19. Elucidate the use of interferometers. Detail the working of laser interferometer. (6)

OR

20. With the help of a schematic diagram explain the working of Scanning electron microscope. (6)
