D 51704 **(Pages : 2)** **Name.....**

Reg. No.....

THIRD SEMESTER (CBCSS—UG) DEGREE EXAMINATION NOVEMBER 2023

Common Course [B.Sc. LRP (Alternate Pattern)]

A12—SENSORS AND TRANSDUCERS

(2019—2022 Admissions)

Time : Two Hours and a Half Maximum : 80 Marks

Section A

Answer the following questions (1-15).
Each question carries 2 marks.

1. Define a Transducer. Give an example.
2. What is the difference between passive and active transducers ?
3. What is the effect of temperature changes on a strain gauge ?
4. List the factors to be considered while selecting a transducer.
5. What is the working principle of capacitance transducer.
6. What are the advantages of potentiometers ?
7. RTDs are commonly made of doped platinum. Why ?
8. What are the different types of IR sensors ?
9. Draw the resistance temperature graph of a thermistor.
10. What is LDR ?
11. What is a pressure transducer ? What is it used for ?
12. What is the principle of operation of a photovoltaic cell ?
13. What are the different types of level transducers ?
14. How the flow nozzle can measure the flow ?
15. State and explain Bernoulli's principle.

(Ceiling : 25 marks)

Turn over

Section B

Answer the following questions (16-23).
Each question carries 5 marks.

16. Define non-linearity in sensors. Explain its effect on measurement.

17. What are the different parts of an inductance transducer ? Explain with a diagram.

18. Explain the principle of operation of capacitive transducer based on change in distance between the plates. Derive the equation for sensitivity also.

19. Explain the working of a bonded strain gauge.

20. What are the different types of thermocouples based on the material ? Explain.

21. Discuss the construction of photo-emissive cell.

22. Discuss the working of U-tube manometer.

23. Explain the flow measurement using rotameter.

(Ceiling : 35 marks)

Section C

Answer any **two** *questions* (24-27).
Each question carries 10 marks

24. Explain the working and principle of operation of an LVDT. Also draw the plot showing variation in amplitude and phase of the output with displacement.

25. Explain the principle and working of the thermistor. What are the different types of thermistors ? Give the applications of thermistor.

26. Explain the working of a capacitive level gauge. Explain the applications.

27. With a neat sketch, explain the construction and working of a venturi meter.

(2 × 10 = 20 marks)