

NGM COLLEGE (AUTONOMOUS) POLLACHI
END-OF-SEMESTER EXAMINATIONS: NOVEMBER - 2025

B.Sc. – PHYSICS
V SEMESTER

MAXIMUM MARKS: 50
TIME: 2 HOURS

PART-IV : SKILL BASED ELECTIVE – I

MECHANICAL MEASUREMENTS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER ALL THE QUESTIONS.

MULTIPLE CHOICE QUESTIONS.

1. What is meant by the range of an instrument? (KI)
 - a) The smallest value it can measure
 - b) The largest value it can measure
 - c) The difference between the maximum and minimum values measurable
 - d) The average of measured values
2. The piezoelectric transducer works based on which physical phenomenon? (KI)
 - a) Variation in capacitance
 - b) Change in resistance
 - c) Generation of voltage when mechanical stress is applied
 - d) Conversion of light into electrical energy
3. Which of the following instruments is suitable for measuring very low vacuum pressures accurately? (KI)
 - a) Bourdon Gauge
 - b) McLeod Gauge
 - c) Piezometer
 - d) U-tube Manometer
4. Cup anemometers are primarily used to measure ----- (KI)
 - a) Temperature
 - b) Pressure
 - c) Wind speed
 - d) Humidity
5. The frequency of a signal is the reciprocal of its ----- (KI)
 - a) Amplitude
 - b) Wavelength
 - c) Time period
 - d) Phase angle

SHORT ANSWER QUESTIONS

6. What is accuracy in measurement? (K2)
7. What type of input does a photoelectric transducer convert into an electrical signal? (K2)
8. What is the full form of CRO? (K2)
9. Name one advantage of ultrasonic flow meters. (K2)
10. What principle does a piezoelectric accelerometer work on? (K2)

SECTION – B

(5 X 8 = 40 MARKS)

ANSWER ANY FIVE OF THE FOLLOWING QUESTIONS.

11. Explain the process of calibration in instrumentation. Why is calibration essential, and how does it affect the performance of measurement systems? (K3)
12. What is a photoelectric transducer? Explain its working principle and mention at least two practical applications. (K3)
13. Discuss the piezoelectric effect and explain how a piezoelectric transducer converts mechanical stress into electrical signals. Also, describe some typical uses of piezoelectric transducers. (K3)
14. What is a McLeod gauge? Explain its construction and working. Also mention its applications and limitations. (K3)
15. Explain the construction and working of a Bourdon gauge with a neat diagram. (K3)
16. Explain the working principle of an Ultrasonic Flow Meter. (K3)
17. Discuss the construction, working, and applications of a piezoelectric accelerometer. (K3)
18. Describe the method to determine the frequency of an unknown signal using Lissajous figures on an oscilloscope. (K3)