Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem Examination Dec-2023

AU3EL07 / FT3EL06 / ME3EL01

Measurement & Instrumentation

Programme: B.Tech. Branch/Specialisation: AU/FT/ME

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

Q.1 i. Which of the following is a desirable property in a measuring instrument? **1**

(a) Accuracy (b) Precision (c) Sensitivity (d) All of these

ii. Galvanometer is an example of which order measuring instrument? **1**

(a) First order (b) Second order

(c) Zero order (d) None of these

iii. LVDT used for displacement measurement uses- **1**

(a) One primary and two secondary coils

(b) Two primary and one secondary coils

(c) Two primary and two secondary coils

(d) None of these

iv. Instrument used for measuring forces is- **1**

(a) Anaemometer (b) Dynamometer

(c) Thermometer (d) Vibrometer

v. Which of the following is a non-contact type thermometer? **1**

(a) Bimetallic strip (b) Vapour pressure thermometer

(c) Optical pyrometer (d) None of these

vi. Mc leod gauge is used for measuring- **1**

(a) Low pressure (b) High pressure

(c) Temperature (d) None of these

vii. Feeler gauges are used to check- **1**

(a) Screw pitch (b) Surface roughness

(c) Unsymmetrical shape (d) Thickness of clearance

viii. Profile meters are used for- **1**
(a) Linear measurement
(b) Angular measurement
(c) Surface finish measurement
(d) None of these

ix. Which of these is not a display device? **1**
(a) Seven segment (b) CRT display
(c) A/D converters (d) LCD

x. A Device that converts energy from one form to another form is- **1**
(a) Transducer (b) Amplifier
(c) Sensor (d) None of these

Q.2 i. Explain the need of calibration of measuring instruments. **2**
ii. Differentiate between accuracy and precision of measuring instruments. **3**
iii. Discuss zero, first and second order measuring instruments. **5**
OR iv. Differentiate between limits and fits. Explain different types of fits with diagram. **5**

Q.3 Attempt any two:
i. Explain the working principle of resistance strain gauge with neat diagram. **5**
ii. How displacement measuring instruments are classified? Describe working of linear variable differential transformers. **5**
iii. How torque of rotating shaft is measured? Explain working of rope brake dynamometer. **5**

Q.4 i. How pressure measuring instruments are classified? **3**
ii. Describe the working of Bourden's tube pressure gauge. Give it's two applications. **7**
OR iii. How flow measuring instruments are classified? Explain working of orifice meters used for flow measurement. **7**

Q.5 i. Write any four applications of feeler gauges and slip gauges. **4**
ii. Discuss methods of surface roughness measurement. **6**
OR iii. What is coordinate measuring machine? How it can be helpful in reverse engineering applications? **6**

Q.6 Write a short note on any two:
i. Selection of transducers for a particular application. **5**
ii. Analog to digital converters. **5**
iii. Display devices used in measuring devices. **5**

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