



B.E. DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EII3202 : Sensors and Measurements

COURSE OUTCOMES

- CO1:** Describe the characteristics and construction details of different sensor.
CO2: Analyze suitable signal conditioning circuits for resistive, reactance and self-generating sensor.
CO3: Explain the fundamental concepts and working principle of analog and digital meters.
CO4: Analyze the specification details for the given sensor/instrument

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

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|---|-----|-------------------|
| 1. Mention the basic requirements of measurement | CO1 | [K ₂] |
| 2. Classify instruments based on their functions. | CO1 | [K ₂] |
| 3. Why are strain gauge known as secondary transducer? | CO2 | [K ₂] |
| 4. Give the application and limitations of wheat stone bridge. | CO2 | [K ₂] |
| 5. State the principle of operation of capacitive transducers. | CO3 | [K ₂] |
| 6. Differentiate the direct and indirect methods of obtaining physical measurement. | CO4 | [K ₂] |
| 7. State the different methods of operation of piezo electric transducers. | CO4 | [K ₂] |
| 8. What is the reason for using MI on both AC and DC? | CO3 | [K ₂] |
| 9. State the advantages of PMMC instruments. | CO3 | [K ₂] |
| 10. Why calibration of instrument is important? | CO4 | [K ₂] |

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

(Answer not more than 400 words)

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|-----|----|--|----|-----|-------------------|
| 11. | a) | Analyze the desirable dynamic characteristics of a measuring system | 8 | CO1 | [K ₃] |
| | b) | Explain the terms sensitivity and linearity of transducers with an example. | 8 | CO1 | [K ₂] |
| 12. | a) | Point out the application of DC potentiometers. Explain the current measurement by potentiometer. | 12 | CO2 | [K ₂] |
| | b) | Explain the principle used in optical pyrometer. | 4 | CO3 | [K ₂] |
| 13. | a) | Describe lead compensation technique and temperature measuring methods in RTD | 10 | CO3 | [K ₂] |
| | b) | Explain in detail about the characteristics of thermistor. | 6 | CO3 | [K ₂] |
| 14. | a) | Describe the cold junction compensation in thermocouple and explain the different types of thermocouple based on the materials used. | 12 | CO3 | [K ₂] |
| | b) | Explain the bimetallic thermometer characteristics. | 4 | CO4 | [K ₂] |
| 15. | a) | Discuss the principle and the construction of LVDT with neat diagram | 10 | CO4 | [K ₂] |
| | b) | Discuss the different types of photoelectric sensor and explain the mode of operation. | 6 | CO4 | [K ₂] |
| 16. | a) | Describe the principle of operation of Hall effect sensor for current measurement | 8 | CO4 | [K ₂] |
| | b) | Describe the construction and working of PMMC instrument and list the difference between PMMC and MI instrument. | 8 | CO3 | [K ₂] |
