

Reg. No.

Question Paper Code

12040

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2023

Fourth Semester

Mechanical Engineering

20MEPC402 - METROLOGY, MEASUREMENTS AND COMPUTER AIDED

INSPECTION

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,
K-Level, CO</i> |
|---|-------------------------------|
| 1. Distinguish between relative error and random error. | 2,K2,CO1 |
| 2. Give the advantages of digital vernier caliper. | 2,K1,CO1 |
| 3. What are the limitations of sine bar? | 2,K1,CO2 |
| 4. Define interchangeability. | 2,K1,CO2 |
| 5. Define effective diameter of thread. | 2,K1,CO3 |
| 6. List the instruments used for measuring temperature. | 2,K1,CO3 |
| 7. What are the benefits of using CMM? | 2,K1,CO4 |
| 8. What is crest and trough? | 2,K2,CO4 |
| 9. List out the function of robot vision system. | 2,K2,CO5 |
| 10. List the types of camera used in machine vision. | 2,K1,CO5 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) (i) Explain about slip gauges and its classification in detail with neat sketch. 7,K2,CO1
(ii) Explain with neat sketch of micrometer. 6,K2,CO1
- OR**
- b) Explain with neat sketch of pneumatic comparator and write down the advantages and disadvantages. 13,K2,CO1
12. a) Explain about the bevel protractor in detail with neat sketch and its applications. 13,K2,CO2
- OR**
- b) Draw the line diagram of Tomlinson surface finish instrument and explain the working principles. 13,K2,CO2

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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13. a) Explain the construction and working principle of optical pyrometer. 13,K2,CO3
OR
b) Explain construction and working principle of resistance temperature detectors. 13,K2,CO3
14. a) Draw and explain the Twyman –green interferometer. 13,K2,CO4
OR
b) List out the various probes used in CMM and explain the working principles. 13,K2,CO4
15. a) Explain the function of machine vision in detail with neat sketch. 13,K2,CO5
OR
b) Describe various techniques used in image processing and analysis. 13,K2,CO5

PART - C (1 × 15 = 15 Marks)

16. a) (i) Describe with a neat sketch the proving ring for force measurement. 7,K2,CO6
(ii) Describe the working principle of hydraulic dynamometer for measuring the shaft power. 8,K2,CO6
OR
b) Explain briefly machine vision application by industry and task. 15,K2,CO6