

# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## May 2023 Semester End Main Examinations

**Programme: B.E.**

**Branch: Industrial Engineering and Management**

**Course Code: 22IM3PCIME**

**Course: Industrial Metrology**

**Semester: III**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 12.05.2023**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

### UNIT - I

- 1 a) State the objectives of metrology. **05**  
b) Differentiate between line and end standards. **05**  
c) Two slip gauges of 10 mm width measuring 1.000 mm and 1.002 mm are kept side by side in contact with each other lengthwise. An optical flat is kept resting on the slip gauges as shown in the figure. Mono-chromatic light of wavelength 0.0058928 mm used in the inspection. What is the total number of straight fringes that can be observed on both slip gauges? **06**  
d) Write a note on snap gauges. **04**

### OR

- 2 a) Explain the concept of interchangeability and selective assembly. Enumerate their advantages and limitations. **10**  
b) Explain hole-basis and shaft-basis systems of fit. Which one is preferred and why? **10**

### UNIT - II

- 3 a) With a neat diagram, explain the basic principle of comparator. **08**  
b) Write a note on Johansson Mikrokator, with a help of a neat block diagram. **06**  
c) Enumerate the advantages and disadvantages of electrical and electronic comparators. **06**

### OR

- 4 a) Explain the effect of pitch error in measurement of screw thread. **06**  
b) What is Parkinson gear tester? Explain its uses in form measurement. **06**  
c) What is tooth thickness? Explain the Measurement of tooth thickness by gear tooth vernier calliper. **08**

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

### **UNIT - III**

- 5 a) List and explain the factors affecting surface finish. Write a note on stylus instruments used to measure surface finish. **10**
- b) What is an Optical Pyrometer? Explain its construction and working. **10**

### **UNIT - IV**

- 6 a) With a neat block diagram explain generalized measurement system. **10**
- b) Explain the application of elastic diaphragm gauges for measuring pressure. **05**
- c) What are transducers? State their applications. **05**

### **UNIT - V**

- 7 a) Write a note on interferometric angle measurement. **10**
- b) Explain cantilever type of CMM used in metrology. **10**

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B.M.S.C.E. - ODD SEM 2022-23