

**CERTIFICATE IN CONDITION
MONITORING (CCOMO)**

Term-End Examination

December, 2024

**MET-001 : METROLOGY, INSTRUMENTATION
AND TRIBOLOGY**

Time : 3 Hours

Maximum Marks : 70

Note : (i) Attempt any **seven** questions.

(ii) All questions carry equal marks.

1. (a) What is standard ? What is the difference between primary and secondary standards ? 5
- (b) What is error ? How do you classify errors ? Briefly explain. 5
2. (a) Define the terms 'Accuracy' and 'Precision'. What is the difference between Accuracy and Precision ? 5

(b) What is fit ? What is the difference between clearance and interference ? 5

3. In a hole and shaft assembly of 30 mm nominal size, the tolerances for hole and shafts are specified below : 10

Hole : $30 \begin{matrix} + 0.02 \\ - 0.00 \end{matrix}$ mm,

Shaft : $30 \begin{matrix} + 0.40 \\ - 0.70 \end{matrix}$ mm,

Determine the following :

- (i) Maximum and minimum clearance obtainable
 - (ii) Hole and shaft tolerance
 - (iii) Type of fit
4. (a) What is gauge ? How do you classify the gauges based on their purpose or uses ? 5
- (b) What are the functions and material used for any *two* of the gauges ? 5

5. (a) Explain the working of Micrometer with neat sketch. 8
- (b) A vernier scale consists of 25 divisions on 12 mm spacing and the main scale has 24 divisions on 12 mm. What is the least count ? 2
6. (a) What are the various line standard angular measuring devices ? List out its applications. 5
- (b) Define magnification of a projector and list out the various components of a projector. 5
7. (a) What is the principle of operation of coordinate measuring machine ? 5
- (b) Explain the formation of white and dark fringes due to interference light. 5
8. (a) Define the term wear. What are the factors influencing wear ? 5
- (b) Briefly explain dry lubrication, boundary lubrication and film lubrication. 5

9. (a) What are the various types of coating ?
Briefly explain any *one* type of coating. 5
- (b) What are the different types of finishes of metals ? Why is finishing so important in coating ? 5
10. Write short notes on any *two* of the following :
5+5
- (a) Electroplating
- (b) Purpose of coating
- (c) Strain gauge
- (d) Comparator

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