

III B. TECH II SEMESTER REGULAR EXAMINATIONS APRIL - 2023
METROLOGY AND INSTRUMENTATION
(MECHANICAL ENGINEERING)

Time: 3 hours

Max. Marks: 70

Note: Answer **ONE** question from each unit (**5 × 14 = 70 Marks**)

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UNIT-I

1. a) Define Fit. Describe various types of Fits with neat sketches. [7M]  
b) Explain in detail about GO and NO-GO plug gauges. [7M]

(OR)

2. a) State and explain the “Taylor’s Principle of Gauge design” with a neat sketch. [7M]  
b) Differentiate between interchangeable assembly and selective assembly, with suitable examples. [7M]

UNIT-II

3. a) Describe with a neat sketch the construction, principle and operation of Profilograph. [7M]  
b) The heights of peak and valleys of 20 Successive points on a surface are 35, 25, 40, 22, 37, 19, 39, 21, 42, 18, 42, 24, 44, 25, 40, 18, 40, 18, 39, 20 microns respectively, measured over a length of 20mm. Determine CLA and RMS values of roughness surface. [7M]

(OR)

4. a) Write a brief note on surface roughness and waviness. [7M]  
b) Why is a Sine bar not used for generating angles greater than  $45^\circ$ , if high accuracy is needed? Explain it with a suitable graph. Explain the different sources of errors in Sine Bars. [7M]

UNIT-III

5. a) Draw the block diagram of a generalized measurement system and explain various elements along with an example. [7M]  
b) With a sketch, explain the construction of optical flats. What are its applications? [7M]

(OR)

6. a) Classify various errors and explain them in detail. [7M]  
b) Discuss the flatness measurement by using surface plate with a neat sketch. [7M]

UNIT-IV

7. a) Explain the working principle of Piezoelectric transducer with neat sketch and also list out its limitations. [7M]  
b) Explain the working of the thermistor with neat sketch and also list out its advantages and limitations. [7M]

(OR)

8. a) Explain with a neat sketch, the working and principle of optical pyrometer for measuring temperature. [7M]  
b) Sketch and explain LVDT. [7M]

UNIT-V

9. a) Explain with neat sketch the construction and working principle of ionization pressure gauge. [7M]  
b) Draw a neat sketch of hot wire anemometer and explain its construction and working principle. [7M]

(OR)

10. a) With the help of a neat sketch explain the principle of operation of Magnetic flow meter. [7M]  
b) Explain with neat sketch the construction and working principle of Dead weight Piston Gauge. [7M]

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