GOVERNMENT OF GUJARAT

# LUKHDHIRJI ENGINEERING COLLEGE
## Morbi - 363642

## MECHANICAL ENGINEERING DEPARTMENT

**Subject Name:** Mechanical Measurement & Metrology **Subject Code:** 3141901
**Semester:** 4th

| Sr. No. | Questions | COs |
|---|---|---|
| 1. | Define unilateral and bilateral tolerances. Give examples for each. | CO1 |
| 2. | Explain with neat diagram, working principle and application of Sigma comparator. | CO1 |
| 3. | List out the advantages and disadvantages of thermistors. | CO2 |
| 4. | Describe with sketch a liquid-in-glass thermometer. Explain its application. | CO2 |
| 5. | Describe with neat sketch the construction and use of gear tooth vernier caliper. | CO3 |
| 6. | What is gauge factor? Explain its importance. | CO2 |
| 7. | Describe the construction and working of Tool maker's microscope. | CO3 |
| 8. | Explain three wire method for measuring effective diameter of a thread. State its advantages over two wire method. | CO3 |
| 9. | What is coordinate measuring machine? Discuss various configuration of CMM. Write the advantages of coordinate measuring machines | CO4 |
| 10. | Explain Parkinson gear tester with a neat sketch. | CO3 |
| 11. | Classification of instruments for pressure measurement. | CO2 |
| 12. | Name the various methods used for measurement of tooth thickness and explain any one of them. | CO3 |
| 13. | Explain the working principle of pneumatic comparators with neat sketch. | CO1 |
| 14. | Explain working of McLeod gauge for pressure measurement. | CO2 |
| 15. | Give the comparison between resistance thermometer and thermocouple. | CO2 |
| 16. | Explain the terms interchangeable manufacture and interchangeable assembly. | CO1 |
| 17. | Explain optical pyrometer for measurement of temperature. | CO2 |
| 18. | How are temperatures measuring instruments classified? | CO2 |
| 19. | Explain in brief the principle of thermocouple stating illustrations. | CO2 |
| 20. | Describe the construction and working of resistance temperature detector (RTD) with neat sketch. | CO2 |
| 21. | State various sources of errors. What are the difference between systematic errorand random error? | CO1 |
| 22. | With a neat sketch, explain light wave length standard. | CO1 |
| 23. | Explain Eddy-current dynamometer with sketch. | CO2 |



**Vision of the Department:**

To deliver quality engineering education for Mechanical Engineers with Professional competency, Human values and Acceptability in the society.

**Mission of the Department:**

- To nurture engineers with basic and advance mechanical engineering concepts
- To impart Techno-Managerial skill in students to meet global engineering challenges
- To create ethical engineers who can contribute for sustainable development of society

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| 24. | Give the classification of threads. | CO3 |
| 25. | Discuss the elements of screw thread with a neat sketch. | CO3 |
| 26. | Explain various forms of gear teeth. | CO3 |
| 27. | Write the advantages of lazers. | CO4 |
| 28. | Describe LVDT giving its advantages, limitations & field of applications. | CO1 |
| 29. | Write a short note on Cathode ray Oscillographs. | CO4 |
| 30. | Explain rope brake dynamometer. | CO2 |
| 31. | Explain the principle of electrical Strain gauges | CO2 |
| 32. | List out advantages and disadvantages of electrical comparators. | CO1 |
| 33. | Explain with neat sketch the construction and working of Johansson Mikrokator. | CO1 |
| 34. | Explain the working principle of strain gauge load cell with neat sketch. | CO2 |
| 35. | Explain line and end standards with examples. | CO1 |
| 36. | Derive the expression for best wire size. | CO3 |
| 37. | Describe with sketch proving ring stating its uses and advantages. | CO2 |
| 38. | Explain hydraulic force meter and pneumatic force meter with advantages and disadvantages. | CO2 |
| 39. | Explain principle of Auto-Collimator and state its application. | CO1 |
| 40. | With neat sketch explain in details about construction and working of bimetallic thermometer. | CO2 |
| 41. | With neat sketch explain working of laser interferometer. | CO4 |
| 42. | Differentiate following terms: - 1) Systematic and random errors, 2) Reproducibility and Repeatability 3) Hole basis and shaft basis systems. | CO1 |
| 43. | What is tolerance? Why tolerances are specified? | CO1 |
| 44. | Define fit. Describe various types of fits | CO1 |
| 45. | Explain the characteristics of good comparator. | CO1 |
| 46. | Explain why hole basis system is generally preferred ? | CO1 |
| 47. | With the help of a neat sketch derive an equation for measuring gear tooth thickness using constant chord method. State its advantages. | CO3 |
| 48. | Define (i) Circular Pitch (ii) Module and (iii) Pressure Angle | CO1 |
| 49. | Explain the working principle of a laser transducer system. | CO4 |
| 50. | Give comparison between involute and cycloidal gears. | CO3 |
| 51. | Define the following characteristics of measurement system: (i) Dead zone, (ii) Drift, (iii) Calibration, (iv) Hysteresis (v) Accuracy (vi) Precision vii)Threshold viii) Linearity | CO1 |



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| 52. | Explain generalized measurement system using suitable example. | CO1 |
| 53. | Why sine bar is not preferred for angles greater than 45˚? Explain. | CO1 |
| 54. | Enlist various methods of measurements. Explain Slip gauges with wringing process. | CO1 |
| 55. | Describe with neat sketch the construction and working of a micrometer/vernier caliper. How least count of micrometer/ vernier caliper can be calculated? | CO1 |
| 56. | Define following terms related to screw thread measurement:<br>(i) Lead, (ii) Pitch, (iii) Crest | CO3 |



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