

(3 Hours)

[Total Marks : 100

N.B. : (1) Question no. 1 is **compulsory**.(2) Attempt any **four** questions out of remaining **six** questions.

(3) Assume additional data if necessary

(4) Support your answers with neat sketches wherever necessary.

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| 1. | (a) | Explain the significance of mechanical measurement. | 5 |
| | (b) | Explain the method of calibration of strain gauges. | 5 |
| | (c) | Discuss interchangeability and its importance. | 5 |
| | (d) | Distinguish between mechanical comparator and electrical comparator. | 5 |
| 2. | (a) | Explain the following terms in brief :- | 10 |
| | (i) | Span and drift | |
| | (ii) | Threshold and resolution. | |
| | (iii) | Accuracy and precision. | |
| | (iv) | Sensitivity and reproducibility. | |
| | (b) | Discuss any two transducers of displacement measurement with their advantages and limitations. | 10 |
| 3. | (a) | Define gauge factor of strain gauge. Derive an expression for gauge factor. Explain how electrical type of strain gauges can be used for measurement of fluid dynamic pressure. | 10 |
| | (b) | Explain the principle of operation, working construction, range, limitation of elastic type of pressure transducers. | 10 |
| 4. | (a) | Distinguish between tachometer and tachogenerator. Explain the principle of working and use of stroboscope for measurement of speed also discuss the limitation of stroboscopic method and methods to overcome them. | 10 |
| | (b) | Explain the working, construction and limitations of Meleod gauges. | 10 |
| 5. | (a) | Compare RTD, thermistors and thermocouples on the basis of principle of working, construction, range of operation, material used, characteristic behaviours. | 10 |
| | (b) | Explain the use of slip gauges. Describe the measurement of cone angle of taper plug gauge using sine bar. | 10 |
| 6. | (a) | What are desired modifying and interfering inputs? Explain with examples. Also suggest the methods to minimize the effect of modifying and interfering inputs. | 10 |
| | (b) | Explain the three wire method for checking the pitch diameter of screw. | 10 |
| 7. | (a) | Explain the working, construction and use of profile projector and autocollimator. | 10 |
| | (b) | Write short notes on :- | 10 |
| | (i) | Go and No-Go gauge. | |
| | (ii) | Gear measurement. | |