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Code No. : 41412

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Mech. Engg.) IV Year I-Semester Main Examinations, December-2017

Metrology and Instrumentation

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2=20 Marks)

1. Explain the use of sine bar.
2. Define fundamental deviation of a shaft.
3. Describe the importance of roughness.
4. Define effective diameter of a screw thread
5. List the errors in measurement systems.
6. State the difference between instrument and gauge.
7. Explain the principle of operation of a load cell.
8. Explain the use of piezoelectric sensor.
9. State the working principle of a thermocouple.
10. Sketch a Seismic transducer and label the parts.

Part-B (5 × 10 = 50 Marks)

11. a) Explain the principle and construction of auto collimator [6]
 b) Indicate the minimum number of angle gauges required to obtain the following angles [4]
 24°3', 110°30'.
12. a) Describe the principle and operation of Taylor-Hobson Talysurf. [5]
 b) Explain the two-wire method of measuring the effective diameter of a screw thread. [5]
13. a) Draw the block diagram of generalized measurement system and explain in detail. [6]
 b) Explain the difference between threshold and resolution. [4]
14. a) Explain the principle and working of piezo electric load cell. [6]
 b) Define strain. Explain the applications of strain gauges. [4]
15. a) Explain the principle and working of Bourdon gauge. [5]
 b) Describe the function of Rotameter with a neat sketch. [5]
16. a) Distinguish between interchangeability and selective assembly. [5]
 b) Describe the nomenclature of screw thread. [5]
17. Answer any *two* of the following:
 - a) Explain the static characteristics of instruments. [5]
 - b) Discuss wire type strain gauge. [5]
 - c) List out the materials used for thermocouple. [5]