Code No. 272

FACULTY OF ENGINEERING

B.E. 4/4 (M/P/AE) I - Semester (Main) Examination, December 2017

Subject: Metrology and Instrumentation

Time: 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (25 Marks)

1 Explain the terms: (i) Lower deviation and (ii) Upper deviation in size determination of a component.

2 What are the applications of slip gauges in industry?

3 What is unilateral and bilateral tolerance? Give a numerical example.

4 What are the advantages of differential pneumatic comparator?

5 What are different Rosette strain gauge arrangement for displacement measurement?

6 Explain the working principle of piezoelectric load cell.

7 Explain super gear features with a sketch for measurement.

8 What are the types of materials used in thermocouples?

9 Explain the term sensitivity of measuring instruments with help of neat diagrams.

10 Distinguish between tolerance and allowance.

PART – B (50 Marks)

11 (a) How are the angular measurements made? Describe the instrument for angular measurement exactly up to a seconds.

(b) Explain the working of tool makers microscope with a neat sketch and its applications.

12 (a) Explain how a precision level can be used to determine the flatness and straightness of machine tool-work table with help of a new diagram?

(b) Explain the working of soundness measuring machine with neat sketch.

13 (a) Derive an expression for best size wire in screw thread.

(b) What are the two corrections applied in the measurement of effective diameter by the method of wires?

14 (a) Discuss the classification of errors in instrumentation systems.

(b) Explain the applications wire and foil type resistance strain gauges with neat sketches.

15 (a) Explain the working of a pirani gauge with a neat sketch to measure pressure.

(b) Explain the problem in bonding of spin gauges while measuring displace.

16 (a) List the instruments used for pressure measurement and explain working principle of bourdon pressure gauge with a neat sketch.

(b) Explain the working principle of LVDT intolerance measurement of component.

17 Explain the following:

(a) Sine bar and its limitations

(b) Gear measurement procedure with a neat diagram

(c) Load cells

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