

**B.E. V Semester**

Examination, December 2014

**Metrology Measurement And Control***Time : Three Hours**Maximum Marks : 70*

**Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define the term standard of measurement?
- b) Define interchangeability?
- c) Define clearly the accuracy and precision.
- d) In a hole and shaft combination of 25 mm nominal size H7 hole limits are +0.021 mm and +0.000 mm. and es shaft limits are -0.040 mm and -0.073 mm.

State the value of

- i) Maximum and Minimum clearance obtainable
- ii) Allowance
- iii) Tolerance of hole and shaft
- iv) MML shaft and hole
- v) What type of fit it is

OR

Explain in brief the Michelson Interferometer?

2. a) Why slip gauges are needed?
- b) Give names of angular measuring instruments?
- c) Classify different types of comparators?
- d) Explain the difference between a comparator and measuring instruments.

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OR

Explain with suitable sketch the principal of Autocollimators in brief?

3. a) What do you mean by surface finish?
- b) Name the methods of surface roughness evaluation?
- c) What do you mean by roughness and waviness of machined surface?
- d) Explain with neat sketch the working of Talysurf instrument for surface measurement?

OR

In a measurement of surface roughness, heights of 20 successive peaks and troughs were measured from a datum and were: 35, 25, 40, 22, 35, 18, 42, 25, 35, 22, 36, 18, 42, 22, 32, 21, 37, 18, 35, 20 microns.

If these measurements were obtained over a length of 20 mm, determine the C.L.A. and R.M.S. value of rough surface.

4. a) Name the methods used for measuring gear tooth thickness?
- b) Discuss the use of base tangent method?
- c) What do you mean by constant chord method?
- d) Describe the two wire method of finding the effective diameter of screw threads?

OR

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What is best wire size? Derive the expression for same in terms of the pitch and angle of thread?

5. a) Discuss the vision system?
- b) What do you mean by laser scanning gauge?
- c) Write down the application of laser metrology?
- d) Explain the working principle of coordinate measuring machine?

OR

Explain the working principle of laser interferometer?