

B.Tech IV Year I Semester (R13) Supplementary Examinations June 2017

**METROLOGY & MEASUREMENTS**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

**PART - A**

(Compulsory Question)

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- 1 Answer the following: (10 X 02 = 20 Marks)
- Name and sketch any two types of fits.
  - What do you understand by the term "Selective assembly"?
  - List out two advantages of optical instruments over conventional measuring instruments.
  - Determine the method of checking the angle of a taper using slip gauges.
  - Define the terms roughness and surface waviness.
  - Calculate the setting of gear tooth vernier to inspect a gear having 35 teeth and module 5 mm.
  - State the basic principle of tachogenerators.
  - If strain gauge has a low gauge factor what does it indicate? Explain.
  - What are the applications of bourdon tube pressure gauge?
  - What are the laws of thermocouple?

**PART - B**

(Answer all five units, 5 X 10 = 50 Marks)

**UNIT - I**

- Differentiate between interchangeable assembly and selective assembly with suitable examples.
- On what factors the variation in size depends in any manufacturing process.

**OR**

- 3 Mention any five conditions for the success of any system of limits and fits.

**UNIT - II**

- 4 Discuss briefly the working and operation bevel protractor.

**OR**

- 5 State the essential requirements for accuracy in the construction of a sine bar. Why the sine bar is not recommended for angles larger than 45° with reference plain.

**UNIT - III**

- 6 Briefly describe the construction, principle and operation of Talysurf with a neat sketch.

**OR**

- 7 Briefly describe with necessary sketches how the following elements of screw threads are measured: (i) Outer diameter. (ii) Effective diameter. (iii) Core diameter. (iv) Pitch diameter. (v) Thread profile.

**UNIT - IV**

- 8 What are transducers and how they are classified? Explain any two transducers with neat diagram.

**OR**

- 9 What are contact less electrical tachometers and explain the working of any two with neat sketches?

**UNIT - V**

- 10 List out five physical properties of matter, which are used to measure temperature and state clearly how each is used.

**OR**

- 11 Explain with a neat sketch the constructional features and basic working principle of McLeod gauge used for the measurement of low pressures.

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