

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)

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

PART - B

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

UNIT - I

- 2 (a) Differentiate between interchangeable assembly and selective assembly with suitable examples.
- (b) 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.
