Exam No: _____

# GANPAT UNIVERSITY

## B. TECH SEM- V (MECHANICAL ENGINEERING) REGULAR EXAMINATION– NOV-DEC 2016

## 2ME505 : MECHANICAL MEASUREMENT AND METROLOGY

**TIME: 3 HRS** **TOTAL MARKS: 60**

**Instructions:** (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.

### SECTION: I

| | | | |
|---|---|---|---|
| Q.1 | A | Explain briefly (1) Hand speed indicator (2) Vibrating reed tachometer | (05) |
| | B | What is load cell? Explain hydraulic load cell with neat sketch. | (05) |

**OR**

| | | | |
|---|---|---|---|
| Q.1 | A | Write a short note on bourdon tube pressure gauge. | (05) |
| | B | Describe the construction and working of Pirani gauge. | (05) |
| Q.2 | A | Explain methods of measuring torque with mechanical torsion meter | (05) |
| | B | Give the classification of dynamometer. Explain gravity balance method for torque measurement | (05) |

**OR**

| | | | |
|---|---|---|---|
| Q.2 | A | Explain the difference between venturimeter and orifice meter. | (05) |
| | B | Write short note on Rotameter. | (05) |
| Q.3 | A | Explain bimetallic thermometer | (05) |
| | B | Explain briefly the construction and working of resistance thermometer. | (05) |

## SECTION: II

Q.4 A Enumerate the sources of errors in micrometer, and also explain how to identify them. (05)

B Explain types of vernier caliper with neat sketch. (05)

**OR**

Q.4 A Explain methods of measuring an angle with help of sine bar. (05)

B Give the description of an auto-collimator stating clearly its principle of working. (05)

Q.5 A Define fits. Explain the various types of fits in detail. (05)

B Between two mating parts of 78 mm basic size, the actual interference fit is to from 0.08 mm to 0.19 mm. The tolerance for hole is same as the tolerance for the shaft. Find the size of both the shaft and the hole on (a) hole basis unilateral system and (b) shaft basis unilateral system. (05)

**OR**

Q.5 A Explain with neat sketch measurement of effective diameter screw thread using three wire methods (05)

B A spur gear of 8 mm module has 50 teeth calculate following proportion: Pitch circle diameter, Addendum and Dedendum, Tooth working height and base pitch. Assume clearance to be 0.25 module. Spur gear has pressure angle of 20°. (05)

Q.6 A Describe following methods of measuring the minor diameter of internal threads: (05)
(1) Using taper parallels (2) Using roller & slip gauge

B Explain constant chord method for measuring gear tooth thickness with neat sketch. (05)

**----------END OF PAPER----------**