Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2017

SUBJECT: MEASUREMENTS AND METROLOGY (AAE 3154)

REVISED CREDIT SYSTEM

(29/12/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. Why inspection is required in Metrology? **(03)**

1B. List and explain the factors affecting the accuracy of the instruments. **(05)**

1C. Explain parallax and interpolation errors. **(02)**

2A. Explain the beam comparator and grid method used for flatness measurement. **(04)**

2B. What are the precautions to be considered during measurement of roundness od surface? **(04)**

2C. Define the coaxiality with respect to DIN and ISO standards. **(02)**

3A. Briefly explain the selective assembly. List its advantages and disadvantages. **(05)**

3B. Explain the maximum and minimum metal condition with respect to Shaft and Hole. **(03)**

3C. Explain “GO” and “NO GO” gauges. **(02)**

4A. Tolerances for a hole and shaft assembly having a nominal size of 50 mm are as follows: **(05)**

For the hole $50.00^{+0.02}_{-0.00}$

For the shaft $50.00^{-0.05}_{-0.08}$

Determine the following: (a) Maximum and minimum clearances (b) Tolerances on shaft and hole (c) Allowance (d) MML of hole and shaft (e) Type of fit.

4B. Explain the following **(05)**
a) bourdon tube and its types
b)Hydraulic and Pneumatic load cell

5A. With a neat sketch explain the gear tooth profile measuring machine. **(05)**

5B. With a neat sketch explain the Abramson's movement mechanical comparator. **(05)**