

**PARUL UNIVERSITY**  
**FACULTY OF ENGINEERING & TECHNOLOGY**  
**M.Tech. Winter 2017 - 18 Examination**

**Semester: 2****Subject Code: 03210153****Subject Name: EXPERIMENTAL TECHNIQUES AND  
INSTRUMENTATIONS IN THERMAL ENGINEERING****Date: 10/01/2018****Time: 02:00pm to 04:30pm****Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1A) Enlist the temperature measuring instruments. Draw neat sketch of any one. (05)**

B) Explain the principle of U Tube manometer with sketch. (05)

C) How to calibrate thermocouples? (05)

**Q.2 Answer the following questions. (Attempt any three) (Each five mark) (15)**

A) Explain the steps of Taguchi method.

B) Differentiate static and dynamic pressure.

C) Explain working principle of Laminar flowmeter with figure.

D) What is a thermal anemometer? How it works?

**Q.3A) Enlist the types of instrumental errors. Explain Parallax error in detail. (07)**

B) Write a short note on Pyrometry. (08)

**OR**

B) Name and explain any one instrument used to measure viscosity of liquid. (08)

**Q.4A) Write a short note on PID controllers. (07)**

**OR**

A) Draw and explain close loop diagram of pneumatic controllers. (07)

B) Explain in brief (i) Reynolds stress (ii) Reynolds averaged Navier Stokes (08)