Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

IV SEMESTER B.TECH. (MECHATRONICS ENGINEERING)

END SEMESTER EXAMINATIONS, JUNE 2017

SUBJECT: MEASUREMENTS AND INSTRUMENTATION [MTE 2204]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain the significance of Isolation in Signal Conditioning. With neat diagrams describe the two types of Isolation Process. **6**

1B. Consider yourself in a situation where you have to measure temperature of a process but the only raw materials available to build your temperature sensor are two different metal strips. Describe the construction and working of your temperature sensor with suitable diagrams. **4**

2A. Explain the construction and working of strain gauge load cell to measure force. **6**

2B. Consider that you are a telecommunication employee and you have to resolve a complaint filed by a customer in Manipal. After initial inspection of the complaint you come to a conclusion that there is grounding in the cable. Suggest a suitable method to find the location of grounding of the cable and explain how it works with required expressions and diagram. **4**

3A. Explain the working principle of Hall Effect Sensor with suitable diagram. **4**

3B. Compare moving coil and moving iron meters. **3**

3C.	What are the different operating forces in a galvanometer? Explain their significance in measuring accurate values?	**3**
4A.	Suggest a method to measure surface texture. Explain the working principle.	**3**
4B.	Explain the construction and working of vortex flow meter.	**4**
4C.	Explain the following with required graphs/diagram: (i) Accuracy (ii) Dead Zone (iii) Linearity	**3**
5A.	Derive the expression for balanced condition of a Wheatstone Bridge.	**4**
5B.	Describe the two systems of fits with neat diagram.	**3**
5C.	Current was measured during a test as 30.4A, flowing in a resistor of 0.105Ω. It was discovered later that the ammeter reading was low by 1.2% and the marked resistance was high by 0.3%. Find the true power as a percentage of the power that was originally calculated.	**3**