Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

A Constituent Institute of MAHE, Manipal

I SEMESTER M.TECH (TRIBOLOGY AND MAINTENENCE)

END SEMESTER EXAMINATIONS, NOV 2018

SUBJECT: ADVANCED SENSORS AND CONDITIONING MONITORING [MME 5161]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL the** questions.
- Missing data if any, Can be suitably assumed

1A.	Discuss the latest five applications of MEMS based Micro-cantilever in different industries and explain the role of micro-cantilever in each case.	**05**
1B.	i. Define statistical moments in time domain analysis ii. Explain the different moments adopted in above time domain analysis	**01** **04**
2A.	What is Micro-fluidics and list out the advantages of it over Macro-systems?	**05**
2B.	Explain with neat sketch the architecture of Multi-Layer Perceptron Neural Network (MLPNN) adopted in bearing defects diagnostic study	**05**
3A.	Discuss the making of valves in microfluidic system using PDMS polymer material.	**05**
3B.	i. Briefly explain the difficulties in frequency domain analysis. ii. Write the problems associated with the conventional denoising methods and sketch the outline methodology of wavelet based denoising technique	**02** **03**
4A.	i. Discuss the synchronization and multiplexing mode in ultrasonic sensors ii. What are the limitations of the ultrasonic sensor applications	**02** **03**
4B.	Explain briefly any two online techniques to detect wear of particles.	**05**
5A.	i. List out two major energy consuming factors in wireless communications and explain the structure of general sensor network Node. ii. What are factors on which wireless communications are categorized and explain the three basic categories?	**02** **03**
5B.	i. Explain the different types of sound fields with neat sketches. ii. Briefly explain the application of infrared camera in thermography.	**03** **02**