



COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END Semester Examination

(MX-521) Advanced Sensor Systems & Instrumentation

Course: M.Tech

Branch: Mechatronics

Semester: Sem I

Year: 2014-2015

Max.Marks:60

Duration: 3Hrs Time:- 2 pm to 5 pm

Date:26/11/2014

Instructions:

MIS No.

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1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

Q.1	<p>Design a suitable sensor for the following application.</p> <p>Temperature measurement of Industrial furnace Max temperature 350°C Accuracy: +/- 0.5%</p> <p>Elaborate your answer with suitable justification. Clearly mention the modeling equations and different configurable parameters that are used to design the sensor.</p>	15
Q.2	<p>Which are most important static and dynamic characteristics that need to be considered while selecting the sensor for a particular application? Define these characteristics. Explain these characteristics with suitable examples.</p>	15

Q.3	It is required to measure the rotary displacement of the shaft. The required accuracy is +/- 1%. Max speed of the rotation is 20 rpm. Which sensor can be used for this application and why? Develop a sensor model for the same along with proper installation details.	15
Q.4	In a Closed Tank, a conventional pressure transmitter is installed. The tank is located in harsh industrial environment. In the same premises there are 6 such tanks. The requirement is to send pressure of each tank to a remote location. Suggest suitable features that need to be incorporated in the conventional sensor so that it will become SMART to suit the requirement. Also comment on sensor packaging, networking and enclosure requirement.	15