SUBJECT CODE NO:- E-8048
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Mechanical) Examination Nov/Dec 2017
Engineering Experimental Technique
(Revised)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. <u>Solve any three</u> questions from each section.
2. Figures to the right indicate full marks.
3. Assume suitable data, if necessary.
4. Use of non-programmable calculator is allowed.

Section -A

Q.1   a. Explain the concept of generalized measurement systems.   06

      b. A certain thermometer has a time constant of 15s and an initial temperature of 20^0C. It is   07
suddenly exposed to a temperature of 100^0C. Determine the rise time, that is, the time to attain
90 percent of the steady-state value, and the temperature at this time.

Q.2   a. What is meant by zeroth-,first-, and second-order systems?   07
      b. What is a fixed error; random error?   06

Q.3   a. What is meant by level of significance; level of confidence?   06

      b. Two resistors R_1 and R_2 are connected in series and parallel. The values of the resistances are   07
$R_1 = 100.0 \pm 0.1\Omega$
$R_2 = 50.0 \pm 0.03\Omega$
Calculate the uncertainty in the combined resistance for both the series and the parallel
arrangements.

Q.4   Write short notes on: (<u>any two</u>)   14
      i.   Chi-square test
      ii.   Graphical analysis & curve fitting
      iii.   Regression analysis
      iv.   Least-squares analysis
      v.   Impedance matching

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Section -B

Q.5   a. What are the practical considerations of seismic instruments?   07

        b. How are elastic elements used for force or torque measurements?   06

Q.6   a. Define the sound –absorption coefficient, noise-reduction coefficient (NRC). Explain how is a   08
            sound-level meter calibrated?

        b. What are the main advantages of a semiconductor strain gauge?   05

Q.7   a. What is meant by "aliasing"? How may it be alleviated?   07

        b. Explain any two types of strain gauges.   06

Q.8 Write short notes on: (<u>any two</u>)   14

        i.   Signal Conditioning
        ii.   Data storage & display
        iii.   The program as substitute for wired logic
        iv.   Sound measurement
        v.   Analog to digital and digital to analog conversion

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