DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
"T3 Examination, May, 2017-2018"

Semester: IV   **Date of Exam**: 24 /05/2018.
Subject: EMI   **Subject Code** ECH213-T
Branch: ECE   **Session**: II
Course Type: Core   **Course Nature: Hard**
Time: 3 Hours   **Program: B.Tech ECE**
Max.Marks: 80   **Signature: HOD/Associate HOD:**

Part- A [20 marks]

Attempt all questions. Each question carries two marks.

Q1. Enlist the components of a signal generator.
Q2. What type of attenuator is generally used?
Q3. Why in signal generators quartz crystal is used instead of L-C oscillator?
Q4. What is meant by spectrum of a signal?
Q5. What do you understand by total harmonic distortion?
Q6. Give three basic requirements of a transducer.
Q7. What is a strain gauge? Where is it used?
Q8. Give advantages and disadvantages of resistance thermometers.
Q9. Why are secondary windings of LVDT connected in opposition?
Q10. What is a capacitive transducer?

Part B [30 marks]
Attempts any TWO questions. Each question carries 15 marks.

Q2.What is a signal generator? How does it differ from an ordinary oscillator? Why is an isolation inserted between signal generator output and oscillator in a signal generator? How is it accomplished?

Q3. Draw the block diagram of a signal generator and explain the working of each block in sequence of operation.

Q4. What is a spectrum analyzer? Explain the working of basic spectrum analyzer.

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Part C [30 marks]

Attempts any TWO questions. Each question carries 15 marks.

Q5.   [7+8]
    (a) What is an LVDT? Explain its merits, demerits and uses.
    (b) The output of an LVDT is connected to a 5V voltmeter through an amplifier whose amplification factor is 250. An output of 2mV appears across the terminals of LVDT when core moves through a distance of 0.5mm. Calculate the sensitivity of LVDT and that of whole set up. The milli-voltmeter scale has 100 divisions. The scale can be read to 1/5 of a decision. Calculate the resolution of instrument in mm.

Q6.   [7+8]

(a) What are the three types of strain gauges? Explain their merits and demerits.
(b) A strain gauge is bonded to the beam 0.1m long and has a cross sectional area of 4 cm^2. Young's modulus for steel is 207 GN/m^2. The strain gauge has an unstrained resistance of 240 Ohms and a gauge factor of 2.2. When a load is applied, the resistance of gauge changes by 0.013Ohms. Calculate the change in length of the steel beam and an amount of force applied to the beam.

Q7.   [7+8]

(a) What are thermistors? Explain the working, construction and applications of thermistors.
(b) What is signal conditioning? Explain with general block diagram the process of signal conditioning. Where is it used?

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