Roll No.	
Paper Code: MEE-332	

M.TECH.
THIRD SEMESTER EXAMINATION, 2016-17
ELECTRONIC INSTRUMENTS AND PROCESS CONTROL

[Time: 3 Hrs.] [Max Marks: 100]

Note: Attempt ***ALL*** questions. Assume suitable data, if required. All question carry equal marks.

1. Attempt any *two* parts of the following: - **(10x2=20)**

(a) Give Classification of transducers.
(b) For a transducer, describe the following
  (i) Input Characteristics
  (ii) Transfer Characteristics
  (iii)Output Characteristic

(c) Describe the constructional details of a resistance potential divider and derive the expression for its output voltage when connected across a meter of finite impedance. Derive the condition for maximum error.

2. Attempt any *four* parts of the following: - **(5x4=20)**

(a) Explain the construction of wire wound strain gauge and derive the expression for the gauge factor.
(b) What are the thermistors. Explain their different form of construction.
(c) Explain the construction and principle of working of a RVDT.
(d) Describe the different modes of operation of piezo-electric transducer and explain the application of piezo-electric transducers.
(e) Describe different techniques to measure flow and liquid level.
(f) Explain the theory of radiation pyrometer.

3. Attempt any *four* parts of the following: - **(5x4=20)**

(a) What are the different types of telemetring systems. Explain the land line telemetering system.
(b) Define amplitude modulation and modulation index. Use a sketch of a sinusoidally modulated AM waveform to help explain the definition.
(c) An AM broadcast station is transmitting at its assigned frequency of 880 kHz. The carrier is modulated by a 3.5 kHz sin wave. Determine the transmitted frequencies.
(d) Describe the salient features of AM and FM telemetery and compare and contrast them.
(e) Explain digital data acquisition systems.
(f) find the carrier and modulating frequencies, the modulation index and the maximum deviation of the FM wave represented by e = 12 sin (6×10^8 t + 5 sin 1250t) V. what power will this FM wave dissipate in a 10 ohm resister.

4. Attempt any *four* parts of the following: - **(5x4=20)**

(a) Difference between 3 and 1/2 digit and 4 digit displays.
(b) Explain the functions of a ramp type digital voltmeter.
(c) What is an XY recorder? How do you distinguish it from a X-t recorder.
(d) Explain the FM method of magnetic tape recording and explain its advantages and disadvantages.
(e) Explain fibre optic transducers.
(f) Describe smart sensors

5. Attempt any *two* parts of the following: - **(10x2=20)**

(a) Using operational amplifier realize a PID controller with separated P, I and D blocks. How the proportional, integral and derivative gains can be adjusted.
(b) Describe the construction of pneumatic relay. What do you mean by the term derivative over run and integral windup.
(c) Draw and explain the architecture of a PLC.