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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Third Semester, B.E. - Industrial and Production Engineering
Semester End Examination; Dec. - 2015
Mechanical Measurement

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each **unit**.

UNIT - I

1. a. How do you classify first stage devices? Give examples for each.   5

   b. With a sketch explain the construction and working of an Ionization transducer.   5

   c. With a neat sketch explain piece-electric effect and modes of operation in piezo electric crystal.   10

2 a. Discuss reflected frictional and reflected inertial amplification.   4

   b. Write a note on temperature problems of mechanical intermediate modifying devices.   6

   c. With a block diagram explain tele metering transmitting and receiving system.   10

UNIT - II

3 a. Explain with a neat diagram D'Arsonval meter movement.   10

   b. Explain the working principle of CRO and give its application.   10

4 a. With a neat sketch explain the working principle of proving ring.   10

   b. Explain Hydraulic dynamometer. Also write the advantages of hydraulic dynamometers. 10

UNIT - III

5 a. Explain with a neat sketch the working of Bonded resistance strain gauge.   12

   b. Describe the process of preparation and mounting of strain gauges.   8

6 a. With a circuit diagram explain the resistance bridge arrangement for strain measurement.   10

   b. Explain ;

   (i) Calibration of strain gauges   10

   ii) Temperature compensation.

UNIT - IV

7 a. Explain the types of pressure measuring systems and list the types of pressure measuring transducer.   10

   b. Explain with a neat sketch the Pirani thermal conductivity gauge.   10

8 a. Explain how a bridgeman gauge is used to measure pressure.   8

   b. With a neat sketch explain the working principle of Bourdon pressure gauge. Also list the elastic members used in pressure measurement.   8

c. Explain the terms :

i) Absolute pressure

ii) Atmospheric pressure   4

iii) Gauge pressure

iv) Vacuum

UNIT - V

9 a. What is Pyrometer? Explain the working principle of optical pyrometer.   10

b. State and explain the law of thermocouples.   10

10a. With a neat sketch explain electrical resistance thermometers.   10

b. List the advantages and disadvantages of thermocouple.   4

c. What are the three thermo electric emf's? How they are obtained?   6

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