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# P.E.S. College of Engineering, Mandya - 571 401

*(An Autonomous Institution affiliated to VTU, Belagavi)*

**Eighth Semester, B.E. - Electronics and Communication Engineering**

**Semester End Examination; Aug. / Sep. - 2020**

**Data Acquisition and Instrumentation**

*Time: 3 hrs* *Max. Marks: 100*

***Note**: i) Answer **TWO** full questions, selecting **ONE** full question from **UNIT - I** and **UNIT - II**.*
*ii) Answer any **THREE** full questions, choosing from **UNIT - III, UNIT - IV** and **UNIT - V**.*

## UNIT - I

1 a. Mention factors that decide the configuration and subsystem of the data acquisition system. 6

b. Discuss the objectives of a DAS. 8

c. Why is it necessary to use pre amplification and filtering before data processing? 6

**OR**

2 a. Explain with neat diagram operation of R-2R Ladder type D/A converter. 10

b. Discuss the signal conditioning of inputs, single channel data acquisition system and multi channel DAS. 10

## UNIT - II

3 a. Define strain gauges and classify different types of strain gauges. 10

b. What are the factors required while selecting a transducers? 6

c. What is thermistor? Mention its advantages. 4

**OR**

4 a. Describe the operation of a piezo – electric transducers. 6

b. Explain the operation of photo-transistor with a one application. 4

c. Explain the construction, principle and operation of linear variable differential transducers [LVDT]. 10

## UNIT - III

5 a. State the three types of systematic errors, giving examples of each. 6

b. Explain static characteristics (errors). 4

c. With neat block diagram, explain true RMS voltmeter. 10

6 a. List the advantage of digital meters over analog meters. 6

b. Calculate the value of multiplier resistor for a 100 V RMS AC range on the voltmeter, $I_{fsD} = 10$ mA, $R_m = 500\ \Omega$. 8

c. State the differences between accuracy and precision of an experiment. 6

Contd....2

## UNIT - IV

7 a. Explain the principle of a successive approximation type DVM. 10

b. Discuss the working principle of digital pH meter. 10

8 a. Explain a micro processor-based ramp type DVM with block diagram. 10

b. Describe the functionality of digital frequency meter with diagram. 10

## UNIT - V

9 a. Write note on;

i) Digital data recorder 10

ii) FM recorder

b. With help of diagram, explain diode bridge modulator. 10

10 a. Explain the working of a circular chart recorder, with diagram. 10

b. Explain the operation of instrumentation amplifier using op-amp. 10

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