

Total No. of Questions : 4]

SEAT No. :

PE71

[Total No. of Pages : 1

[6579]-373

T.E. (Mechanical/Mechanical-S.W.) (Insem)

MECHATRONICS

(2019 Pattern) (Semester - I) (302044)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever necessary.
- 5) Use of electronic pocket calculator is allowed.

- Q1)** a) Define Sensor. How it works? Classify different types of sensors. [7]
b) Draw a suitable schematic & explain working of inductive type of proximity sensor with its advantages. [8]

OR

- Q2)** a) Define Encoder. Differentiate between Absolute Encoder and Incremental Encoder. [7]
b) Illustrate the functioning of a Linear Hydraulic Actuator using a clear and labeled diagram with its advantages. [8]

- Q3)** a) 100 sensors are to be connected to a microprocessor, State method for communication also name the process and explain in brief with its advantages. [7]
b) A 4-bit R2R type Digital-to-Analog Converter (DAC) supplied with a 5 volts DC reference potential. Calculate : [8]

- i) Full-Scale output potential
- ii) Least Significant Bit (LSB) for said configuration.
- iii) Explain the significance of these values in the context of digital-to-analog conversion.

OR

- Q4)** a) With a neat block diagram explain the components and working of a Data Acquisition System. [7]
b) A 4 bit DAC has a reference voltage 20V & binary input is 1101. [8]
i) Find the analog output voltage.
ii) Justify the steps involved in the calculation & explain in brief the relationship between the binary input, the number of bits, and the reference voltage.

