

Total No. of Questions : 4]

SEAT No. :

PC-72

[Total No. of Pages : 2

[6360]-74

T.E. (Mechanical/Mechanical Sandwich) (Insem)

MECHATRONICS

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

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) *Answer Q.1 or Q. 2, Q. 3 or Q. 4.*
- 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) What is Color Sensor? Explain RGB Type Color Sensor with Neat Sketch. [7]

b) What is MEMS Accelerometer? Explain with sketch. How can it be used in Mobile Phones as a compass or Gyroscope. [8]

OR

Q2) a) What is LIDAR? With a neat sketch Explain working of LIDAR? [7]

b) Illustrate the functioning of a Rotary Pneumatic Actuator using a clear and labeled diagram with its applications and advantages. [8]

Q3) a) What is a Data Acquisition System? Explain Steps in Signal Conditioning. [7]

b) A 4-bit R2R type Digital-to-Analog Converter (DAC) supplied with a 15 volts DC reference potential. [8]

Calculate :

- 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

P.T.O.

OR

- Q4)** a) What is need of Communication? Differentiate between Serial communication & Parallel communication. [7]
- b) A 4 bit DAC has a reference voltage 15 V & binary input is 1100. [8]
- Find the analog output voltage.
 - Justify the steps involved in the calculation & explain in brief the relationship between the binary input, the number of bits, and the reference voltage

