Total No. of Questions : 4]

SEAT No. : [ ]

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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

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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]**

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

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