Total No. of Questions : 4]

SEAT No. :

P-5073

[Total No. of Pages : 2

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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 niarks.***
4) ***Assume suitable data wherever necessary.***
5) ***Use of electronic pocket calculator is allowed.***

Q1) a) What is Mechatronics? Describe the basic elements of the mechatronics system with a block diagram. **[7]**

b) List and explain any eight static characteristics along with definition. **[8]**

OR

Q2) a) Define Actuator? What are Selection Criteria of Actuator? **[6]**

b) What is BioSensor? How does it Works? Explain its application in (ECG) Electrocardiography? **[9]**

Q3) a) With a suitable example, explain where serial communication would be preferred over parallel communication. List advantages of serial communication. **[7]**

b) A 4-bit R2R type Digital-to-Analog Converter (DAC) supplied with a 2.56 volts DC reference potential. **[8]**

Calculate :

i) Full-Scale Output Potential

ii) Least Significant Bit (LSB) for this DAC configuration.

Explain the significance of these values in the context of digital-to-analog conversion.

P.T.O.

OR

Q4) a) Explain Digital Video Broadcasting with one application. **[7]**

b) A 4 bit DAC has a reference voltage 10 V & binary input is 1011. **[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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