

M.Sc. (Electronics) (New CBCS Pattern) Sem-III
PSELT304.2 - Paper-IV : Mechatronics

P. Pages : 2

Time : Three Hours



GUG/W/22/11259

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw well labeled diagrams wherever necessary.
 3. Use of calculator is allowed.

Either:

1. a) What is mechatronics system? 8
Differentiate between traditional and mechatronics design.

- b) What is LVDT? Explain construction and working of LVDT. Draw its characteristics. 8

OR

- c) Draw general block diagram of mechatronics system and explain. 8

- d) Differentiate between open and closed loop system. 8

Either:

2. a) Explain unit and ramp response of first order. 8

- b) Describe: 8

i) Natural and forced response.

ii) Transient and steady state response.

OR

- c) Describe the basic model for an electrical system. 8

- d) Describe the rotational system with basic building block. 8

Either:

3. a) Obtain Laplace transform of first order differential equation of the system. 8

- b) What is Bode Plot? Explain with suitable examples. 8

OR

- c) What is transfer function? Explain the transfer function of R-C series circuit. 8

- d) Differentiate between a system with negative and positive feedback. 8

Either:

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| 4. | a) | Draw the block diagram of digital control system and explain. | 8 |
| | b) | Describe Ziegler and Nichols criterion with suitable diagram? | 8 |

OR

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|-----------|-----|---|----------|
| | c) | Describe PD and PI controllers with suitable diagram. | 8 |
| | d) | Explain op-amp as signal conditioner with suitable example. | 8 |
| 5. | a) | Explain optical encoders in mechatronics. | 4 |
| | b) | Define: | 4 |
| | i) | Accuracy | |
| | ii) | Sensitivity related to transducer. | |
| | c) | Explain location of poles on s – plane. | 4 |
| | d) | Explain Self tuning control system. | 4 |
