PSELT304.2 - Paper-IV : Mechatronics

P. Pages : 1

Time : Three Hours

GUG/W/23/11259

Max. Marks : 80

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Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and well-labelled diagram wherever necessary.

1. a) What is a control system? Explain it with a suitable example. **8**

b) Draw the block diagram of closed loop control system and explain the function of each blocks. **8**

OR

c) Discuss the static and dynamic characteristics of the transducer. **8**

d) Explain the working of the push-pull displacement sensor. **8**

2. a) Discuss the mechanical system building blocks. **8**

b) Explain the basic building block of the rotational system. **8**

OR

c) Explain the natural and forced responses of first-order system with suitable examples. **8**

d) Explain the transient and steady – State response of the control system. **8**

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

b) Explain the negative feedback system with a suitable example. **8**

OR

c) Explain the frequency response in first-order system. **8**

d) Discuss the Bode plots with examples. **8**

4. a) Explain op-amps as a signal conditioner with a suitable example. **8**

b) Explain the electronic proportional controller with a suitable example. **8**

OR

c) Describe the adaptive control system. State its advantages. **8**

d) Draw and explain the digital control system's block diagram. **8**

5. a) Discuss the open loop system. **4**

b) Discuss mechanical and electrical analogy. **4**

c) Discuss poles of an unstable system. **4**

d) Differentiate between PD and PI. **4**

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