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Question Paper Code : 21048

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Seventh Semester

Mechanical Engineering

080120045 — MECHATRONICS

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

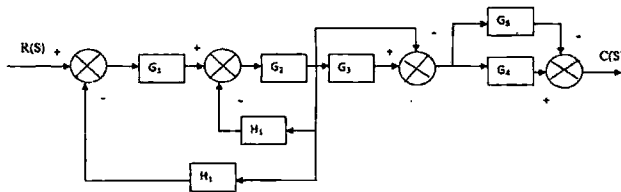
1. Name the main elements constitute in mechatronic system.
2. Differentiate open and closed loop system with example.
3. What is meant by incremental and absolute encoder?
4. Draw the circuit diagram and waveform of cycloconverter.
5. List the components employed in programmable logic controller.
6. Write the difference between series and parallel interfacing.
7. What is meant by sampled data type in computer numeric controller machine?
8. How microcontroller is different from microprocessor?
9. Enumerate the advantages of micro sensors over conventional sensor.
10. Mention the constraints in mechatronic system design.

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about hydraulic and pneumatic actuators for a mechatronic systems.

Or

- (b) (i) Determine the $C(S)/R(S)$ for a block diagram shown below. (10)



- (ii) Write short notes on servomechanism. (6)

12. (a) Explain in detail construction and working of LVDT. Also draw the characteristics of output voltage for different core positions for LVDT.

Or

- (b) With a neat sketch write the construction and working of a BLDC motor and a DC servomotor.
13. (a) Write short notes on following :
- Logic function
 - Latching
 - Ladder diagram
 - I/O processing.

Or

- (b) Discuss in detail about integrator and differentiator. Also draw its output waveform for square wave input.
14. (a) Explain path control loop for position and velocity control in axis controlling system for constant frequency and constant velocity commands.

Or

- (b) With neat block diagram explain the architecture of 8051 microcontroller and also write its addressing modes.
15. (a) Write short notes on :
- Pressure sensor and thermal sensors
 - Bulk manufacturing and surface manufacturing

Or

- (b) With a neat sketch design a mechatronic system employed for material transfer in shop floor of manufacturing industry.