Register Number……

**B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010**

Sixth Semester

**MECHATRONICS ENGINEERING**

U07MH603: Design of Mechatronics System

**Time: Three Hours** **Maximum Marks: 100**

**Answer ALL the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. In an intelligent supervisory control system, find the right sequence levels of control in a machining process
   (a) Shop floor control, servo control, plant control, process control, supervisory control
   (b) Servo control, supervisory control, plant control, shop floor control, process control
   (c) Servo control, shop floor control, plant control, supervisory control, process control
   (d) Servo control, process control, supervisory control, shop floor control, plant control
2. MMI stands for
   (a) Mind machine interface (b) Material machine interface
   (c) Man machine interface (d) Man material interface
3. A system which requires not only to acquire and process data but also to send data back to the real time process is known as
   (a) Monitoring system (b) Data acquisition and control system
   (c) Real time system (d) Data acquisition system
4. The conditions favour for an over framing is
   (a) If the simulated time value is greater than real time value
   (b) If the simulated time is equal to real time
   (c) If the simulated time is less than the real time value
   (d) If the simulated time is not equal to real time
5. How many actuators are present in a data acquisition application
   (a) Zero (b) One (c) Two (d) Four
6. How many strain gauges are used for strain gauge weighing system.
   (a) Two (b) Four (c) Six (d) Eight
7. In thermal cycle fatigue of a ceramic plate, the hot temperature set point is
   (a) 100°F (b) 105°F (c) 115°F (d) 120°F

8. Which sensor is used in skip control of a CD player

(a) Ultrasonic sensor (b) Speed sensor

(c) Temperature sensor (d) Tilt sensor

9. Which of the following is sensing parameter for machine diagnostics

(a) Cutting tool condition, power consumption

(b) Tool wear, machine vibration

(c) Cutting tool condition, machine vibration, power consumption, tool wear

(d) Machine vibration, cutting tool condition

10. Artificial neural net works is used to improve the

(a) Off line process control and inspection

(b) On line process control and inspection

(c) On line and off line process control and inspection

(d) On line or off line process control and inspection

**PART B (10 x 2 = 20 Marks)**

11. Distinguish between Mechatronics system and multi disciplinary system.
12. Define ergonomics.
13. What do you mean by data acquisition system.
14. How does over framing occurs in real time interface process.
15. Write the strain formula which is used to test the transportation bridge surface materials.
16. Distinguish between absolute encoder and incremental encoder.
17. What are the different components required for data acquisition and control system.
18. What do you mean by skipping effect.
19. Define condition monitoring
20. List the advantages of micro sensors used in Mechatronics

**PART C (5 x 14 = 70 Marks)**

21. (a) Describe the different steps involved in the Mechatronics design process.

**(OR)**

(b) Describe the general approach to the Man/Machine relationship.

22. (a) List the major components of a data acquisition and control system and explain their interconnections for a system with four sensors and two actuators.

**(OR)**

(b) Write note on over framing

23. (a) Explain the data acquisition case study of measuring the strength of materials used for beams in transportation bridges.

**(OR)**

(b) Describe the data acquisition case study to apply the strain gauge to a weighing application.

24. (a) Explain the use of data acquisition and control for de-icing temperature control system.

**(OR)**

(b) How do you use pinball machine tilt sensor to eliminate the skipping effect that occurs in CD player.

25. (a) Explain condition monitoring system for production systems with examples.

**(OR)**

(b) What is fuzzy control. Discuss the different elements of fuzzy logic systems.

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