

Con. 8403-13.

94  
LJ-13604**(REVISED COURSE)**

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Questions No. 1 is compulsory.  
 (2) Solve any **four** questions from **remaining** questions.  
 (3) Assume suitable **data** wherever **required**.

1. Answer the following :- 20
  - (a) Compare RBFN and MLP network.
  - (b) State application of Kohonen self organising maps.
  - (c) Explain Intersections and Union of fuzzy set.
  - (d) What are various characteristics of ANN.
2. (a) What is learning process ? What do you mean by supervised and unsupervised learning with suitable example ? 10
  - (b) Explain RBF to solve XOR problem 10
3. (a) Write an algorithm for back propagation and explain about the updation of weight process. 10
  - (b) Draw the architecture of Hopfield network. Explain how it is more stable than the BPN. 10
4. (a) Explain the following term :- 10
  - (i) ANFIS
  - (ii) Brain state in box model.
  - (b) Explain perceptron convergence theorem. 10
5. (a) Explain steepest descent algorithm. 10
  - (b) Explain fuzzy membership functions. 10
6. (a) Distinguish between self organized learning Networks and Kohonen network. 10
  - (b) If A is the fizzy set defined by 10

$$A = \frac{0.5}{x_1} + \frac{0.4}{x_2} + \frac{0.7}{x_3} + \frac{0.8}{x_4} + \frac{1}{x_5}$$

List all  $\alpha$  cuts of A.
7. Write short notes on (any four) :- 20
  - (a) Fuzzy controller
  - (b) Learning factors
  - (c) Boltzman machine
  - (d) Neurodynamic model
  - (e) LMS algorithm
  - (f) Fuzzy relation and functions.

25/11/2013

B.E. Electronics sem VIII (Rev) Nov-13  
Sub - Advance VLSI Design.

ws-Con-2013-1

Con. 8237-13.

(REVISED COURSE)

LJ-13528

(3 Hours)

[Total Marks : 100

NB:

Question No. 1 is compulsory,

Attempt any four out of remaining six questions,

Assume any suitable data whenever required and justify the same.

1. a) Explain switched capacitor amplifier. 5  
b) Explain programming techniques of EEPROM. 5  
c) If the width and length of the interconnect is reduced by 30%, then the propagation delay of an interconnect will increase or decrease, by how much %? 5  
d) Explain the need of interconnect delay model. 5
  2. a) What would be the conductor width of power and ground wires to a 50 MHz clock buffer that drives 100 pF of on-chip load to satisfy the metal-migration consideration ( $J_{AL} = 0.5 \text{ mA}/\mu\text{m}$ )? What is the ground bounce with chosen conductor size? The module is 500  $\mu\text{m}$  from both the power and ground pads and the supply voltage is 5 volts. The rise/fall time of clock is 1ns. (Assume sheet resistance of wire =  $0.05 \Omega/\text{sq}$ ). 10  
b) Draw 6T SRAM cell and explain its operation with butterfly plot. 10
  3. a) Explain 4-bit CLA adder with its carry equations, logical network and write its Verilog description. 10  
b) Explain how ESD (electro-static discharge) affect the MOSFET. Give and explain input protection circuits. 10
  4. a) Give and explain the maximum and minimum frequency calculation of clock signal which determine the data transfer rate through cascade system. 10  
b) Draw 4 X 4 pseudo-nMOS ROM array circuitry having stored following data. 10  
1111, 1011, 1101, 0111. Also list the no. of address pins, data pins and word lines. 10
  5. a) Draw and explain CMOS two stage OP-AMP. 10  
b) Give and explain single phase clock system and explain its drawback. 10
  6. a) Explain various technique of clock generation. Discuss 'H' tree clock distribution. 10  
b) What is cross talk in IC's? Explain various methods to reduce it. 10
  7. Write short notes on (any three) 20  
a) Schmitt trigger input protection circuit.  
b) Reliability issues in CMOS circuits.  
c) Manchester carry Circuit.  
d) Interconnect Scaling.
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Con. 9063-13.

(REVISED COURSE)

LJ-13841

(3 Hours)

[Total Marks : 100]

- N.B. :** (1) Question No.1 is **compulsory**.  
 (2) Answer any **four** questions out of the remaining **six**.  
 (3) Draw neat **diagram** and assume **suitable** data wherever **required**.

1. (a) Differentiate between RISC and CISC processors. 5  
 (b) Draw and Explain CAN bus frame format 5  
 (c) Explain status Register of MSP 430 5  
 (d) Differentiate between procedure and object oriented language. 5
2. (a) Explain operating Modes of ARM 7 and also explain Registers available in each mode. 10  
 (b) Explain clock circuit and Registers use to control function of clock module of MSP 430. 10
3. (a) Compare and Explain ARM7 with ARM 7 TDMI. 10  
 (b) Describe with suitable Diagram SP1 Interface. 5  
 (c) Explain Interrupt Latency with example and what are the factors responsible for Interrupt Latency ? 5
4. (a) Suggest various techniques used for interprocess communication in an Embedded system. 10  
 (b) Explain Data Structure Queue, Circular Queue, Link list and Array with Respect to Embedded C Programming. 10
5. (a) What is Bounded and Unbounded priority Inversion ? Also explain How it is solved using priority Inheritance and priority ceiling. 10  
 (b) Explain different pre-emptive scheduling policies with suitable examples. 10
6. (a) For an Embedded system, prepaid electricity meter, whose units (readings) are down loaded wirelessly. Also a parallel LCD of a meter is installed in the house. Discuss the necessary Hardware required with justification. Support your answer with suitable block diagram of the embedded electricity meter. 12  
 (b) Design an automatic Tea and coffee vending machine based on FSM Model for the following requirement. The tea/coffee vending is initiated by user inserting a 5 rupee coin. After inserting the coin the user can either select coffee or tea or press cancel to cancel the order and take back the coin. 8
7. Write a short note on :- 20
  - (a) Explain spiral Model used in EDLC
  - (b) What is H/W and S/W co-design
  - (c) Black Box and White Box testing.

4/12/13

(3 Hours)

[ Total Marks : 100

- N.B. : (1) Question No. 1 is **compulsory**.  
(2) Attempt any **four** questions out of remaining **six** questions.  
(3) Assume suitable **data** wherever **required**.

- Q1. a) Explain and draw basic four steps for transferring Frame  $k-1$  to frame  $k$  **5 marks**  
b) Explain the basic steps involved in bounded deviation algorithm for straight line motion. **5 marks**  
c) Define Pixel function, Shrink Operator and Swell operator **5 marks**  
d) What are the advantages & disadvantages of PLC system **5 marks**
- Q2. a). What is the inverse kinematics problem and state different methods to solve inverse kinematics problem in brief. **10 marks**  
b) Explain the conditions for the existence of the Inverse Kinematics solutions. **4 marks**  
c) Define total workenvelope, joint space work envelope, dexterous work envelope, with their relevant formulas and with a neat sketch. **6 marks**
- Q3. a). Obtain the Inverse Kinematics solution of the 4 axis Adept - 1 SCARA robot with its IK algorithm starting from the arm matrix. Explain each joint variable computation in brief. **10 marks**  
b) Find a single composite transformation matrix  $T$  ( $T_{YPR}$  only with numeric values) which maps the tool coordinates  $M$  into the wrist coordinates  $F$  following the sequence of rotations of  $M$  frame about the unit vectors of  $F$ . **10 marks**

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Q.4. a) Explain with example normalization of the performance index for removing the effects of average light intensity. **10 marks**

b) What are area descriptors? What are its advantages over line descriptors? **10 marks**

Q.5. a) Explain how the chain code of a boundary is constructed? **10 marks**

b) Explain the template matching algorithm for object recognition. **10 marks**

Q.6. a) Explain workspace analysis of 5 axis Rhino XR-3 Robot arm **10 marks**

b) Write a PLC ladder logic programme for 4 junction traffic light controller **10 marks**

Q.7. write a short note on : **20 marks**

- i) Classification of robots
  - ii) linear interpolation method .
  - iii) Screw transformation
  - iv) Gross motion planning.
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