Q.P. Code :10650

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question No. 1 is **compulsory.**
2. **Attempt any three questions from remaining five questions.**
3. **Assume suitable data where required.**
4. **Figures** to the **right** indicate **full marks.**

Q.1 (solve Any 4)
a] Compare NMOS & CMOS technology in VLSI design. 05
b] Implement the following function using Dynamic CMOS logic. 05
$$Y = \overline{A(B + C)}$$
c] Compare Ripple carry adder with CLA. 05
d] Explain working Principle of flash memory. 05
e] Explain importance of low power design. 05

Q.2 a] Compare the full scaling & constant voltage scaling models of MOSFETS. Demonstrate the effects of scaling 10
on the area, delay, power consumption and current density of the device
b] Explain transfer characteristics for NMOS. Inverter showing different regions. What is the effect of variation 10
in W/L ratio?

Q.3 a] Draw 1T DRAM cell and explain it's write, read, hold & refresh operation. 10
b] Explain scheme for multiplication of 101*010. 10

Q.4 a] Explain various techniques of clock generation & clock distribution. 10
b] Consider a CMOS Inverter circuit with following parameters. 10
V_{DD}= 3.3v.
$V_{To,n}$= 0.6v.
$V_{To,p}$= -0.7v.
K_n= 200 μ A|V²
K_p= 80 μ A|V²
Calculate noise Margins of the circuit Consider K_R = 2.5 & $V_{To,n} \neq V_{To,p}$.

Q.5 a] Draw JK Flip Flop using. CMOS and explain the working. 10
b] Draw CLA (carry lookahead adder) carry chain using dynamic CMOS logic. 10

Q.6 Write Short notes on (any three) 20
a] Latch up in CMOS
b] Sense Amplifier.
c] Interconnect scaling.
d] 4*4 Barrel Shifter.

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Q.P. Code :08431

[Time: 3 Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question no. 1 is compulsory.
2. Attempt any three questions from the remaining five questions.
3. Assume suitable data whenever necessary.
4. Figure to the right indicate full marks.

Q.1 Explain in brief

a) Integral controller   05

b) Temperature transmitter   05

c) Telemetry   05

d) I-P converter   05

Q.2 a) What are the different types of control valve actuators? Explain the working of any two   10
actuators in detail.

b) What are the different types of hydraulic pumps? Explain with neat sketch   10

Q.3 a) Explain loading of valves in pump application with diagram.   10

b) Explain control valve characteristics. An equal percentage valve has maximum flow of 50cm^3/s   10
and a minimum of 2cm^3/s. If the full travel is 3cm; find the flow at a 1 cm opening.

Q.4 a) Explain in details construction and working of time delay valve.   10

b) What are the different applications of a flapper nozzle system? With neat diagram explain the   10
flapper nozzle system and its characteristics.

Q.5 a) Explain the need of controller tuning. What are the different methods of controller tuning?   10

b) Explain compressed air receiver unit. What are the different control strategies for air receiver   10
unit?

Q.6 a) Compare conventional and smart transmitters. Explain the working of DP transmitter.   10

b) Write short note on: 10

i.   Data logger

ii. Pressure regulation valve.

Q. P. Code: 10416

Time: 3 Hours   **Marks: 80**

N.B : (1) Question No.1 is compulsory.

(2) Attempt any three questions from remaining questions.

(3) Figures to the right indicate full marks.

Q1(a) Multiply using Booth's algorithm (-7) * (3).   5

(b) Explain parallel processing.   5

(c) Write a note on IA-32 register model.   5

(d) Compare Horizontal and Vertical organization.   5

Q2(a) What is cache coherency? Explain various methods to achieve it.   10

(b) Explain microprogramming. Draw and explain microprogrammed control unit.   10

Q3.(a) Consider a 4-way set associative Cache Mapping with Cache Block Size=16 bytes

Cache size=8k, Main Memory Size =64k. Design a cache structure and show how the

Processor address is interpreted.   10

(b) Why is page replacement algorithm required. Explain how pages are replaced between

cache and main memory using replacement policies.   10

Q4 (a) Explain various access methods for I/O devices.   10

(b) Explain how a virtual address is converted into physical address using paging .Also

explain Translation Look- aside Buffer.   10

Q5 (a) Explain with examples different addressing modes of IA-32.   10

(b) Write microinstructions for the instruction Add R_0 , $[R_3]$.   5

(c) Explain in brief about Nanoprogramming.   5

Q6(a) Write a note on Flynn's classification.   10

(b) Explain the Hazards in Pipelining and solutions to overcome them.   10

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REVISED COURSE
(3 Hours)   [Total Marks : 80

N.B.
1) Question No-1 is Compulsory.
2) Attempt any Three (03) Questions from remaining Five (05) Questions.
3) Assume suitable data where ever necessary.

1.   Attempt the following Questions (any4)
   a) Draw the Two Transistor Model Of SCR? State all the currents Equations of IC_1, IC_2 &, I_A 5
   b) Why forced commutation is required in DC to AC converters.   5
   c) Calculate output voltage for a step down chopper with Vin=200 V and Duty Cycle =0.25   5
   d) What is the Need of freewheeling diode in rectifiers state with example   5
   e) Explain brief why harmonic Neutralization is necessary in output of inverter.   5
   f) Define and explain performance parameter of controlled rectifier   5

2. (a) What do you mean by Commutation of SCR? State the various methods of commutation of SCR, Explain force method in detail.   10

   (b) What is difference between a cycloconverter and an ac voltage controller, Explain single phase converters with waveforms   10

3. (a) Explain the Basic Structure& static characteristics of IGBT with creation of inversion layer &conductivity modulation   10

   (b) Draw and Explain Buck-Boost Converter with the help of circuit diagram and waveforms Derive the relation for load voltage.   10

4. (a) A three phase bridge inverter is operated in 180^0conduction mode is operating from a 560V DC supply ,Find out the following (I)RMS Value of output line and phase voltage (II)RMS Value of fundamental components of line and phase Voltages   10

   (b) Explain the Static I-V Characteristics of TRIAC? State Forward and Reverse Characteristics, Compare DIAC- TRIAC.   10

5. (a) Why the protection of SCR in Necessary? State the various protection of SCR, Explain any one method in detail.   10

   (b) State comparison between control strategies of chopper 1.PWM control 2.Varable Frequency Conrol 3.Current limit control. A step down chopper feeds a resistive load of 10 ohms from 100V DC supply .Calculate duty cycle required so that power dissipation in load is 100watts   10

6. Write short note on (any 4) :   20
   (a) Half wave controlled rectifiers with R load with waveforms
   (b) full bridge inverter with waveforms
   (c) Cuk regulators
   (d) Construction& operation of GTO
   (e) Compare IGBT and Power BJT

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Q.P.Code: 016380

(3 Hours)   **[Total Marks: 80]**

NB:
1) Question No. ONE is compulsory.
2) Out of remaining questions, attempt any THREE questions.
3) In all FOUR questions to be attempted.
4) All questions carry equal marks.
5) Answer to each new question to be started on a fresh page.
6) Figures in brackets on the right hand side indicate full marks.
7) Assume Suitable data if necessary

Q1. Attempt any four   (20 marks)
   a) State and explain relation between DTFS, DFT and ZT
   b) Explain the need of DSP processor.
   c) Differentiate between Butterworth and Chebyshev filters.
   d) Explain frequency wrapping effect in designing IIR filter.
   e) Compare DSP processor and microprocessor.

Q2. a) Explain Gibbs Phenomenon and state its significance in FIR filter design.   (10 marks)

   b) Explain different addressing modes of TMS 320C67XX DSP processor.   (10 marks)

Q3. a) What are the salient features of TMS 32067C67XX family of DSP processors.   (10 marks)

   b) Compute the circular convolution of the sequence using DFT and IDFT, $x1(n)=\{1,2,0\}$ and $x2(n)=\{2,2,1,1\}$ (10 marks)

Q4. a) Compute IDFT of the following sequence using inverse FFT algorithm $X(k) = \{3,0,3,0,3,0,3,0\}$
                                                        (10 marks)
   b) Explain VLIW architecture in details   (10 marks)

Q5. a) Design Butterworth LPF to meet following specifications
      Passband gain is 0.89
      Passband frequency edge 30Hz
      Attenuation 0.20
      Stopband edge 75Hz   (10 marks)

   b) Design analog Butterworth filter that has -2 dB passband attenuation of 20 rad/sec and at least -10 dB stopband attenuation at 30 rad/sec.   (10 marks)

Q6. Write short note on following (Any two)   (20 marks)
   a) Frequency transformation in IIR filter
   b) Application of DSP in speech and Radar processing
   c) Limit cycle Oscillations

Q.P. Code:18380

(2 Hours)   Total Marks-40

Note:

   i.   Q.1 is compulsory

  ii.   Attempt any three questions from remaining five.

 iii.   Each question carries **10** marks.

1. Answer any five.

    a. What is structured cabling?

    b. What is web server?   2

    c. Explain CIA triangle in brief.   2

    d. Write four good practices used for password management. 2

    e. What is Ethernet?   2

    f. What is Biometric system? Explain it.   2

    g. State Network topologies.   2

2.

    a. What is a firewall? Differentiate among the different types of firewall. 5

    b. Explain Enterprise resource planning (ERP) and its need. 5

3.

    a. Why is Audit needed and what is the planning required for conducting Audit? 5

    b. Differentiate between DBMS and RDBMS. 5

4.

    a. Explain the term business process outsourcing (BPO). 5

    b. What is the need of intranet in an organization? State the benefits. 5

5.

    a. What is HTTP and what is its purpose? 5

    b. What is e-business? Differentiate it with e-commerce. 5

6.

    a. Define operating system. Explain different types of operating system. 5

    b. State different types of cable? Explain fiber optic cable in brief. 5

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