

QP Code : 6263

(3 Hours)

[ Total Marks : 80

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

1. (a) Draw CMOS implementation of D Flip Flop. 20  
 (b) Implement  $y = A + B \cdot C$  using dynamic CMOS logic.  
 (c) Explain latchup in CMOS inverter.  
 (d) Define scaling. Explain significance of scaling in VLSI circuits.
2. (a) Draw CLA (carry lookahead adder) carry chain using. 10  
 (i) Static CMOS logic  
 (ii) Dynamic CMOS logic  
 (iii) Pseudo NMOS logic  
 (b) Draw 1T1R DRAM cell and explain its read write and refresh operation. 10
3. (a) Explain clock generation networks and distribution networks used in VLSI circuits. 10  
 (b) Give and explain CMOS input & output protection circuits. 10
4. (a) Implement 4x4 barrel shifter using transmission gate. Explain various operation using the same. 10  
 (b) Explain programming techniques used for EEPROM. 10
5. (a) What are the drawbacks of dynamic CMOS logic. Show the modification in dynamic CMOS logic to overcome its drawback. 10  
 (b) Explain operating regions of CMOS inverter with equations. 10
6. Write short notes on. 20  
 (a) Interconnect scaling  
 (b) Cross talk  
 (c) Array multiplier

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- N.B. : (1) Question No. 1 is compulsory.  
 (2) Attempt any three questions from remaining questions.  
 (2) All questions carry equal marks.  
 (3) Figures to the right indicate full marks.

Q1.

- What is parallel processing?
- Write short note on nanoprogramming.
- Compare RISC and CISC machines.
- What is effect of multiple data paths in design of processor.

Q2.

- Explain Booth's Algorithm. Solve  $(+7) * (-5)$  using Booth's Algorithm.
- Compare Hardwired control unit and Microprogrammed control unit.

Q3.

- Consider main memory size as three pages. Following page address trace is generated by execution of a program

2	3	2	2	1	5	4	2	3	1	2	4
4	4	2									

Assume main memory is cleared initially. Find page hit ratio by

- FIFO
- LRU
- LFU replacement policies.

- Explain IA-32 architecture in detail.

Q4.

- Explain Cache memory and describe Cache mapping techniques.
- What is bus arbitration? What are different methods to resolve bus arbitration.

Q5.

- Explain advantages of interrupt driven I/O over polling. Explain interrupt driven I/O access with one example.

- Draw and explain microprogrammed control unit for multiplier.

Q6. Write short note on any four

- Pipeline Hazards.
- Memory Hierarchy
- Restoring Division algorithm.
- 8085 addressing modes
- Arithmetic Instructions in IA-32 architecture.



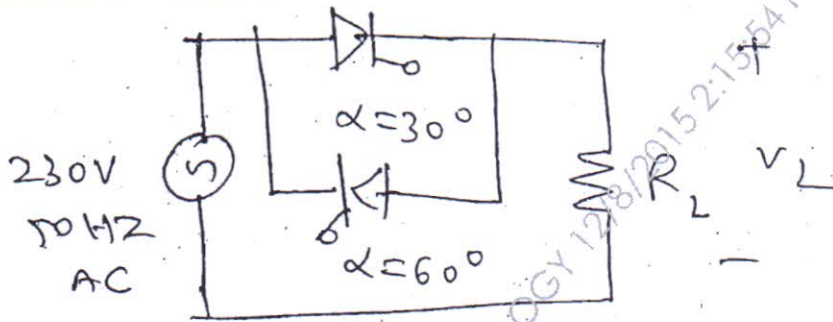
QP Code : 6390

(3 Hours)

[ Total Marks : 80

- N. B. : (1) Question No. 1 is compulsory.  
 (2) Solve any **three** questions out of remaining **five** questions.  
 (3) **Figures to the right indicate full marks.**

1. (a) Draw and explain gate characteristics of SCR. 5
- (b) Differentiate between symmetrical IGBT and asymmetrical IGBT. 5
- (c) Draw output voltage waveform for the circuit given below. Draw waveform with scale. 5



- (d) Explain in brief why harmonic neutralisation is necessary in the output of inverter. 5
2. (a) Explain the working of dual converter with all four modes of operation. Draw circuit diagram and waveforms. 10
- (b) Draw and explain the working of buck boost converter with the help of circuit diagram and waveforms. Derive the relation for output voltage. 10
3. (a) Explain three phase bridge inverter with 120° conduction mode. Draw circuit diagram and waveforms. 10
- (b) With the help of circuit diagram and waveforms explain bi-directional AC control circuit using TRAC & DIAC. 10
4. (a) Explain semiconverter circuit for the conversion of AC to DC. Draw waveforms for  $\alpha = 60^\circ$ . Explain how it eliminates the need of freewheeling diode in case of R-L Load to increase the power factor. 10
- (b) Explain class D commutation circuit with the help of circuit diagram and waveforms. 10

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5. (a) Explain in detail SOA of MOSFET. 5  
(b) Explain multiple pulse width modulation to control the output of inverter with sine wave as a reference signal. 10  
(c) What do you understand by cycloconverter. Draw single phase cycloconverter with circuit diagram and waveforms. 5
6. (a) Draw and explain three phase fully controlled bridge rectifier with R load in continuous mode. Derive the relation for output voltage. 10  
(b) A single phase semiconverter is operated from 120V 50 Hz ac. supply. The load resistance is 10 ohm. If the average output voltage is 25% of the maximum possible average output voltage. Determine. 10  
(i) Firing angle  
(ii) RMS and average output current  
(iii) RMS and average thyristor current.

(3 Hours)

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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. Write any four top security concerns.
- b. What do you mean by Information systems?
- c. What is search engine?
- d. Write a small note on E-business.
- e. What is data mining?
- f. Explain E-governance framework.
- g. Write a note on structured cabling

2.

- a. Write a detailed note on firewall.
- b. Explain seven layer OSI stack.

3.

- a. Explain the benefits of intranet.
- b. Write a note on password management system.

4.

- a. Explain Enterprise Resource Planning (ERP) and its need.
- b. Explain web browsers with different examples.

5.

- a. Explain data quality problem and assurance.
- b. Define operating systems? Which are the types of operating systems? Explain

6. Write a note on following terms related to IT audit.

- i) Information audit.
- ii) Audit schedule
- iii) Audit plan
- iv) Audit preparation
- v) Internal audit.

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