

B.E. DEGREE EXAMINATIONS: NOVEMBER 2009

Third Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U07EC303: Digital Electronics

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions:-

PART A (10 × 1 = 10 Marks)

1. A parity bit is
 - (a) Used to indicate uppercase letters
 - (b) used to detect errors
 - (c) Is the first bit in a byte
 - (d) is the last bit in a byte
2. The decimal number 127 may be represented by
 - (a) $1111\ 1111_2$
 - (b) $1000\ 0000_2$
 - (c) EE_{16}
 - (d) $0111\ 1111_2$
3. Which of these are universal gates?
 - (a) Only NOR
 - (b) only NAND
 - (c) Both NOR and NAND
 - (d) NOT, AND, OR
4. A device which converts BCD to seven segments is called
 - (a) Encoder
 - (b) Decoder
 - (c) Multiplexer
 - (d) Demultiplexer
5. A mod 4 counter will count
 - (a) From 0 to 4
 - (b) from 0 to 3
 - (c) From any number n to n+4
 - (d) none of above
6. The simplest register is
 - (a) Buffer registers
 - (b) shift register
 - (c) Controlled buffer register
 - (d) Bidirectional register
7. A table which has exactly one stable state for each row is called
 - (a) Flow table
 - (b) State table
 - (c) Primitive Flow table
 - (d) State diagram
8. _____ is said to have occurred if two or more state variables change their values when there is a state transition.
 - (a) Hazards
 - (b) Races
 - (c) Cycles
 - (d) Critical Races

9. What type of computer chips are said to be volatile?
- (a) RAM chips (b) ROM chips
(c) EPROM (d) EEPROM
10. What are responsible for storing permanent data and instructions?
- (a) RAM chips (b) ROM chips
(c) DRAM chips (d) SRAM

PART B (10 × 2 = 20 Marks)

11. What is the feature of Gray code?
12. Simplify: $Y = (AB + C)(AB + D)$
13. Distinguish between Combinational and Sequential circuits.
14. Define propagation delay of a gate.
15. Construct a full adder block diagram using two half adders and logic gates.
16. What is meant by Universal Shift Register?
17. When do hazards occur?
18. Define cycle.
19. What is a PLD?
20. Compare EPROM with EEPROM.

PART C (5 × 14 = 70 Marks)

- 21(a) Find the SOP and POS expressions using K-map for the given function and realize using the basic gates.

$$Y = \sum_m (1, 2, 9, 10, 11, 14, 15)$$

(OR)

- (b) Generate a Hamming code for the given code 11011011 using even parity.
- 22 (a) Explain the operation of Look Ahead – Carry Adder with neat diagram.

(OR)

- (b) Explain the operation of ECL gate.

23 (a) Briefly explain the operation performed by Master – Slave flip-flop using JK flip-flop

(OR)

(b) i) Draw a 4 bit serial in serial out shift register and briefly explain. (7)

ii) Draw a 4 bit parallel in serial out shift register and briefly explain. (7)

24 (a) Explain different types of hazards occur in Asynchronous Sequential Circuits.

(OR)

(b) Give brief detail about Races occur in Asynchronous Sequential Circuits.

25 (a) What is a PAL? Explain the architecture of a PAL with neat diagram.

(OR)

(b) Write short note on:

(i) ROM (7)

(ii) PROM (7)
