



6. What is the difference between a ring shift counter and a Johnson shift counter?
- (a) there is no difference (b) a ring is faster  
(c) the feedback is reversed (d) the Johnson is faster
7. Which hazard is overcome by properly designed two level AND-OR or OR-AND circuit
- (a) dynamic hazard (b) static-0 hazard  
(c) static-1 hazard (d) none of the above
8. Table that is not a part of asynchronous analysis procedure.
- (a) transition table (b) state table  
(c) flow table (d) excitation table
9. Which of the memory is volatile memory?
- (a) ROM (b) RAM (c) PROM (d) EEPROM
10. In a read-only memory information can be stored
- (a) at the time of fabrication  
(b) by the user only once during its life time  
(c) by the user a number of times  
(d) in any of the above ways depending upon the type of memory

PART - B (5 x 2 = 10 Marks)

11. Convert 0.640625 decimal numbers to its octal equivalent.
12. Define combinational logic.
13. Write down the characteristic equation for JK flip flop.
14. Differentiate fundamental mode and pulse mode asynchronous circuits.
15. What is programmable logic array? How it differs from ROM?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Convert the binary number  $(101111.1101)_2$  in to decimal. (4)
- (ii) Convert the hexadecimal number in to decimal A3BH and 2F3H. (4)
- (iii) Design a 4 bit BCD to Excess-3 code converter. (8)

Or

(b) Simplify the following expression using K-map

(i)  $Y = \sum_m (7, 9, 10, 11, 12, 13, 14, 15)$

(ii)  $Y = m_1 + m_5 + m_{10} + m_{11} + m_{12} + m_{13} + m_{15}$  (16)

17. (a) Design a BCD adder and explain its working with necessary logic diagram. (16)

Or

(b) Give the CMOS logic circuit for NOR gate and explain its operation. (16)

18. (a) Design and explain a ring counters with suitable example. (16)

Or

(b) Design a MOD-6 synchronous counter using J-K Flip-Flops. (16)

19. (a) Design an asynchronous sequential circuit that has two internal states and one output. The excitation and output function describing the circuit are as follows:

$$X = x_1x_2 + x_1y_2' + x_2'y_1; \quad Y = x_2 + x_1y_1'y_2 + x_1'y_1 + x_1; \quad Z = x_2 + y_1 \quad (16)$$

Or

(b) What are hazards? When does the hazard occur in combinational circuits and quote an example? Name the types of hazards and how they are avoided. (16)

20. (a) Explain with neat diagrams a RAM architecture. (16)

Or

(b) (i) Draw the block diagram of a PLA and explain its IC 7575-PLA. (16)

