

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 53054

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Third Semester

Electronics and Instrumentation Engineering

15UEI304 - DIGITAL ELECTRONICS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following is minimum error code?
(a) Octal code (b) Grey code (c) Binary code (d) Excess 3 code
- Which of the following is the most widely used alphanumeric code for computer input and output?
(a) Gray (b) ASCII (c) Parity (d) EBCDIC
- How many bits are required to store one BCD digit?
(a) 1 (b) 2 (c) 3 (d) 4
- The number of full and half-adders required to add 16-bit numbers is
(a) 8 half-adders, 8 full-adders (b) 1 half-adder, 15 full-adders
(c) 16 half-adders, 0 full-adders (d) 4 half-adders, 12 full-adders
- How many flip flops are required to construct a decade counter?
(a) 10 (b) 8 (c) 5 (d) 4
- 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 following memories uses one transistor and one capacitor as basic memory unit
- (a) SRAM (b) DRAM (c) Both (a) and (b) (d) none
10. A 64-bit word consists of
- (a) 4 bytes (b) 8 bytes (c) 10 bytes (d) 12 bytes

PART - B (5 x 2 = 10 Marks)

11. Define De-morgan's theorem.
12. Define combinational logic.
13. Write down the characteristic equation for JK flip flop.
14. Differentiate fundamental mode and pulse mode asynchronous circuits.
15. Describe RAM and its block diagram.

PART - C (5 x 16 = 80 Marks)

16. (a) Minimize the given switching function using Quine-Mcclusky method.
 $f(x_1, x_2, x_3, x_4) = \Sigma(0, 5, 7, 8, 9, 10, 11, 14, 15)$. (16)

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) Explain the operation of universal shift register with logic diagram. (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:

$$X = x_1x_2 + x_1y_2 + x_2y_1; \quad Y = x_2 + x_1y_1y_2 + x_1y_1 + x_1; \quad Z = x_2 + y_1 \quad (16)$$

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 the classification of memories. (16)

Or

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