

Registration No :

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

Total Number of Pages : 02

B.TECH
PET31104

3rd Semester Back Examination 2019-20

DIGITAL ELECTRONICS

BRANCH : ECE, ETC

Max Marks : 100

Time : 3 Hours

Q.CODE : HB825

Answer Question No.1 (Part-1) which is compulsory, any EIGHT from Part-II and any TWO from Part-III.

The figures in the right hand margin indicate marks.

Part- I

Q1 Only Short Answer Type Questions (Answer All-10) (2 x 10)

- What do you mean by "maxterm" and "true maxterm"?
- Draw the logic diagram of 4-bit parallel subtractor.
- How an odd parity bit is generated for 4 data bits?
- Convert $(126)_{10}$ to octal and binary number.
- Whether PLA same as PAL?
- Define Critical race and non-Critical race.
- What is meant by "lock-out" problem in counter?
- Define setup time of timing diagram.
- Differentiate between SRAM and DRAM.
- Distinguish between a combinational logic circuit and sequential logic circuit.

Part- II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Find minimal sum for following Boolean function using Quine- McClusky method.

$$f(a, b, c, d) = \sum m(7,9,12,13,14,15) + d.c(4,11)$$

- Simplify using Karnaugh Map. Write the Boolean equation and realize using NAND gates.

$$f(w, x, y, z) = \sum m(0,2,4,6,8) + \sum d(10,11,12,13,14,15)$$

- With the neat circuit diagram explain the carry look ahead adder with relevant expression.
- With the neat circuit diagram explain the keypad interface using 74147, 10 line to BCD encoder.
- Explain the operation of switch debouncer built using SR latch with the help of circuit and waveforms.
- Explain the working of +ve edge triggered D-flip flop with the functional table.
- Illustrate the operation of 4-bit binary ripple counter using logic diagram and timing diagram.
- Design synchronous Mod-6 counter using D-flip flop to generate the count sequence.
(0, 2, 3, 6, 5, 1, 0)

- i) Describe the principle of universal shift register with the help of logic diagram and mode control table.
- j) Write the basic recommended steps for the design of a clocked synchronous sequential circuits.
- k) What is magnitude comparator? Design a two bit digital comparator by writing TT, relevant expression and logic diagram.
- l) Discuss on concept of working and application of semiconductor memories.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3** What are the advantages of tabulation method? Determine the Minimal sum of products for the Boolean expression $F = \sum(1,2,3,7,8,9,10,11,14,15)$ using tabulation method. **(16)**
- Q4**
 - a) Write a note on priority checker. **(8)**
 - b) Explain the operation of serial-in-serial-out shift register. **(8)**
- Q5** Implement $f(a, b, c, d) = \sum m(0,1,5,6,7,10,15)$ using
 - a) 8:1 MUX **(16)**
 - 4:1 MUX
- Q6** Write the difference between static and dynamic RAM. Draw the circuits of one cell of each and explain its working. **(16)**