Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**

PEL4I103

4th Semester Regular / Back Examination 2018-19

DIGITAL ELECTRONICS CIRCUITS

BRANCH : EEE

Max Marks : 100

Time : 3 Hours

Q.CODE : F487

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)**

a) What is a single precision-Floating-point representation of numbers?

b) Differentiate between active high and active low terms associated with inputs and outputs.

c) According to you, which circuits are called as universal combinational circuits?

d) Design a 2-bit equality detector, mention the functions used.

e) How can you convert a decoder to demultiplexer?

f) Among RAM and ROM which is widely used in current applications of data storage?

g) Write the significance of Boolean algebra in digital circuits.

h) How D/A conversion takes place?

i) Explain the significance of gray and binary code.

j) Prove the identity, 1+X+Y+……. = 1, using truth table.

Part- II

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

a) Explain the operation of a 4-bit SIPO shift register using flip-flops and the timing diagram.

b) Design a 32:1 MUX using 4:1 MUX(s) only. Mention the LSB and MSB in the diagram.

c) Using NOR gates only, design Y (A,B,C)= AB+ BC' + ABC.

d) Design aDecade counter that counts up.

e) Design a 4-bit active low input decoder circuit.Show the truth table. Draw the necessary circuit.

f) Express the complement of the following function in product-of-sum form.
F(A, B, C, D)= π(1,5,6,7,9,11,12)

g) Explain the properties of TTL logic family in details.

h) How will you convert a SR flip-flop to T flip-flop and vive-versa? Show the necessary tables and draw the diagrams.

i) Given two numbers, A= 1110100 and B= 1011011, perform the subtraction A-B and B-A using 1's complement method.

j) Design a 4x3 binary multiplier circuit.

k) Explain the Master-Slave operation using D flip-flop. Draw the necessary circuit diagrams.

l) Differentiate between registers and shift registers. Give examples.

Part-III

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

Q3	**a)**	Find all the prime implicants of the following function : F (A, B, C, D) = ∑ (0,2,4,5,6,7,8,10,13,15). Mention all the desired minimizations.	**(8)**
	b)	Minimize the function:F (w,x,y,z) = ∑ (4,5,6,7,12,13,14), d (w,x,y,z) = ∑(1,9,11,15)	**(8)**
Q4		Design a 4-bitup-down asynchronous counter using a negative edge-triggered JK flip-flop. Consider the two asynchronous inputs and a synchronous clock. Draw the state diagram, necessary tables and final circuit diagram.	**(16)**
Q5		Using CMOS logic, implement the function F (A, B, C) = (A+B). (B+C). (A+C). Draw the circuit diagram. Explain the operation.	**(16)**
Q6	**a)**	Explain the A/D and D/A conversion.	**(10)**
	b)	Differentiate between PAL and PLA.	**(6)**