Registration No :

Total Number of Pages : 02
B.Tech.
PEI4G001

4th Semester Regular Examination 2017-18
DIGITAL ELECTRONIC CIRCUITS
BRANCH : AEIE, EIE, IEE
Time : 3 Hours
Max Marks : 100
Q.CODE : C1154
Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1 **Answer the following questions: multiple type or dash fill up type:**   **(2 x 10)**

a) Expansion of PLA is _____

b) When two counters are cascaded, the overall MOD number is equal to the _____ of their individual MOD numbers.
   A. product
   B. sum
   C. log
   D. reciprocal

c) A Latch is _____ sensitive.

d) In the decimal numbering system, what is the MSD? _____

e) Determine the output frequency for a frequency division circuit that contains 12 flip-flops with an input clock frequency of 20.48 MHz.
   A. 10.24 kHz
   B. 5 kHz
   C. 30.24 kHz
   D. 15 kHz

f) Convert the following nos
   $(11011.101)_2 = ($ _____ $)_{10}$
   $(436)_8 = ($ _____ $)_{16}$

g) Which IC is used for the implementation of 1-to-16 DEMUX?
   A. IC 74154
   B. IC 74155
   C. IC 74139
   D. IC 74138

h) How many 3-line-to-8-line decoders are required for a 1-of-32 decoder?
   A. 1
   B. 2
   C. 4
   D. 8

i) The output of AND gate will be 1 only when all of its inputs are equal to _____

j) The storage element for a static RAM is the _____.
   A. diode
   B. resistor
   C. capacitor
   D. flip-flop

Q2   **Answer the following questions:** *Short answer type*   **(2 x 10)**

a) Find the 2s complement of the following binary numbers:
A. 101110
B.110011.11

b) Perform following subtraction using 2's complement method
$(11010)_2 - (10000)_2$

c) What is shift register? Draw the circuit diagram for it.

d) What is state diagram?

e) Design a 3 bit binary down counter.

f) Differentiate between volatile and non-volatile memory.

g) Implement EXOR function using NAND gates only.

h) What is a Latch?

i) Express the Boolean function $F = AB + A'C$ in a product of maxterm

j) What is tri state logic? Where it is used. Explain.

Part – B (Answer any four questions)

Q3 **a)** Design a combinational circuit which acts as a both full adder and full substractor.   **(10)**

b) Implement the following boolean function using single 8:1 multiplexer
$F(A,B,C,D)=\sum m(1,4,6,9,13)$ **(5)**

Q4 **a)** Explain working of master-slave JK flip-flop with necessary logic diagram, state equation and state diagram.   **(10)**

b) List few comparison of Combinational logic circuit and sequential Logic Circuit   **(5)**

Q5 **a)** Given the Boolean function: **(10)**
XY+XY+YZ
Implement it
(i) with OR and NOT gates.
(ii) with AND and NOT gates

b) Write short notes on RAM and ROM.   **(5)**

Q6 **a)** Design a combinatorial circuit that converts a decimal digit from 2,4,2,1 code to the 8,4,2,1 code?   **(10)**

b) Compare SRAM, DRAM in terms of cost, size, packing density, speed and technology.   **(5)**

Q7 **a)** Define Mealy machine and explain with an example. Define Moore machine and explain with an example   **(10)**

b) Design a 3 bit asynchronous counter using SR flip flop.   **(5)**

Q8 **a)** Design the MOD-8 ripple counter.   **(10)**

b) Explain with a neat diagram of a Ring counter.   **(5)**

Q9 **a)** Design a Mealy type sequence detector to detect a serial input sequence of 101.   **(10)**

b) Explain the concept or terms: fan in, fan out, power dissipation.   **(5)**