B.Tech. SEM -IV Bio Medical 2014 Course (CBCS) : SUMMER - 2019
SUBJECT: DIGITAL LOGIC CIRCUITS

Day: Thursday
Date: 30/05/2019

S-2019-2633

Time: 10.00 AM TO 01.00 PM
Max Marks: 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat labeled diagrams **WHENEVER** necessary.

Q.1 Minimize the following expressions using K-map and realize it using the basic gates. **(10)**

i) $Y=\sum m(1,2,9,10,11,14,15)$

ii) $Y=\sum m(1,3,4,5,7,9,11,13,15)$

OR

Q.1 Perform the following using 2's complement method. **(10)**

i) $(4)_{10} - (9)_{10}$

ii) $(-6)_{10} - (-2)_{10}$

iii) $(9)_{10} - (4)_{10}$

iv) $(6)_{10} - (6)_{10}$

v) $(11010)_2 - (10000)_2$

Q.2 a) What is meant by a priority encoder? Give example. **(06)**

b) What is a Multiplexer? State applications of Multiplexers. **(04)**

OR

Q.2 a) Describe Excess-3 adder with the help of neat diagram. **(06)**

b) Design 5 bit magnitude comparator using comparator IC7485. **(04)**

Q.3 a) What do you mean by tristate logic? Describe in detail one application of such logic circuit. **(06)**

b) Describe the operation of Tristate buffer. **(04)**

OR

Q.3 Describe the following Logic families: **(10)**

i) TTL **ii)** CMOS **iii)** ECL

Q.4 Carry out the following Flip Flop conversions: **(10)**

i) J-K to D **ii)** J-K to T **iii)** S-R to T

OR

Q.4 Describe Mealy and Moore model with a help of an example. **(10)**

Q.5 Implement MOD-12 ripple counter using J-K Flip Flop and describe its working. **(10)**

OR

Q.5 a) State various applications of shift registers. **(06)**

b) Draw logic diagram and waveform of twisted ring counter. **(04)**

Q.6 A combinational circuit is defined by the function **(10)**
$F_1(A,B,C) = \sum m(4,5,7)$
$F_2(A,B,C) = \sum m(3,5,7)$ Implement the circuit with a PLA having three input three product terms and two outputs.

OR

Q.6 Classify the semiconductor memories in detail. **(10)**

* * * *