

B.TECH SEM – V (2007 COURSE) (BIOMEDICAL ENGG.) :
WINTER - 2017

SUBJECT: DIGITAL ELECTRONICS

Day: **Thursday**
Date: **11/01/2018**

W-2017-2484

Time: **02.30 PM TO 05.30 PM**
Max. Marks: **80**

N.B.:

- 1) Q. No. 1 and Q. No. 5 are **COMPULSORY**. Out of remaining attempt any **TWO** questions from each section.
- 2) Figures to the **RIGHT** indicate full marks.
- 3) Answer to the both sections should be written **SEPARATE** answer book.
- 4) Assume suitable data if necessary.

SECTION-I

- Q.1** a) Explain the different types of memories. (05)
b) Write a short note on burst code. (05)
c) Verify the given expression using Truth Table. (04)
 $A + BC = (A + B)(A + C)$
- Q.2** a) Perform the following binary subtraction using 1's complement method (06)
i) $(5)_{10} - (9)_{10}$ ii) $(7)_{10} - (6)_{10}$
b) Define and explain following terms: (07)
i) Figure of merit ii) Fan out iii) Fan in
- Q.3** a) Distinguish between :- (06)
i) Excess -3 code and Gray code
ii) Binary code and Gray code
b) A receiver received the following hamming code 0011100101101 with odd parity. Find the error in the received code and give the corrected data. (07)
- Q.4** a) Realize the following expression using K-map with minimum number of gates (07)
 $Y = \sum m(1,2,3,4,5,7,9,11,13,15)$
b) State and prove De-Morgan's theorem. (06)

SECTION-II

- Q.5** a) What is race around condition in J-K FF? How it is eliminated? (05)
b) Explain the ASM technique of designing the sequential circuit. (04)
c) What is multiplexer? Give its necessity and explain 8:1 multiplexer. (05)
- Q.6** a) Implement a 16:1 multiplexer using 8:1 multiplexer. Give the Truth tables, draw the logic circuit and explain its working. (06)
b) Design a Gray to Binary code converter and implement it using a suitable logic gates. (07)
- Q.7** a) Explain the operation of 4 bit bidirectional shift register with a neat diagram. (07)
b) Convert a D flip-flop to JK flip-flop. (06)
- Q.8** a) Explain multiplexer method of implementing ASM chart. (06)
b) Write a short note on RTL notations. (07)