

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE –
RAIGAD -402 103

Winter Semester Examination – Dec - 2019

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Branch: Information Technology

Sem:- III

Subject: - Switching Theory and Logic Design (BTITC302)

Marks: 60

Date:- 12 / 12 /2019

Time:- 3 Hr.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. Attempt all questions.

- (a) Convert the following (6)
(i) $(3000.45)_{10} = (?)_8$ (ii) $(1076)_8 = (?)_{16}$ (iii) $(85.63)_{10} = (?)_2$
- (b) If the Hamming code receiver receives a sequence 1110110 is (6)
determine whether it contains error or not, if there is any error
correct it and determine the message bits transmitted.

Q.2. Attempt all questions.

- (a) Simplify using K-Map $f(a,b,c,d) = \sum m(0,1,3,5,9,12) + \sum d(2,4,6,7)$ (6)
- (b) Using QM method simplify $f(W,X,Y,Z) = \sum m(0,3,5,6,7,10,12,13) + \sum d(2,9,15)$ (6)

Q.3. Attempt all questions.

- (a) With suitable diagram explain the working of TTL-NAND gate. (6)
Also explain the use of multi-emitter transistor.
- (b) Draw the circuit diagram for CMOS-NOR gate and explain its (6)
working using Truth-Table.

Q.4. Attempt all questions.

- (a) **Implement a Full Adder using 4:1 Mux. Discuss its working** (6)
- (b) **Design BCD to Excess-3 code converter.** (6)

Q.5. Attempt all questions.

- (a) **Compare Moore and Mealy State Machines** (6)
- (b) **Describe in brief working of J-K Flip-Flop. Draw the suitable diagram for explanation.** (6)

Q.6. Attempt all questions.

- (a) **Design a combinational circuit using a ROM. The circuit accepts a 3-bit number and generates an output binary number equal to the square of the input number.** (6)
- (b) **Implement the following two Boolean functions with a PLA:** (6)
 $F_1(A, B, C) = \sum(0, 1, 2, 4)$
 $F_2(A, B, C) = \sum(0, 5, 6, 7)$

*****Paper End*****
