

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST 1 EXAMINATION – 2015
B.Tech III SEMESTER

COURSE CODE: 10B11EC401

MAX MARKS:15

COURSE NAME: DIGITAL ELECTRONICS

MAX TIME: 1 HR

COURSE CREDITS: 4

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1)

- a) Perform subtraction using 2's complement form: $10001000 - 11100010$
- b) Convert the hexadecimal number to Decimal $B2F_{16}$
- c) Convert the octal number to binary 7526_8 (1 X 3 = 3)

Q2)

- a) Apply DeMorgan's theorem to the following expression

$$\overline{A\overline{B} + \overline{C}D + EF}$$

- b) Simplify the following Boolean expression using Boolean algebra

(1.5 X 2=3)

$$AB + A(B+C) + B(B+C)$$

- Q3) Use Karnaugh map to convert the following POS expression into a minimized POS expression, a standard SOP expression, and a minimum SOP expression

$$(\overline{A} + \overline{B} + C + D)(A + \overline{B} + C + D)(A + B + C + \overline{D})(A + B + \overline{C} + \overline{D})(\overline{A} + B + C + \overline{D})(A + B + \overline{C} + D) \quad (3)$$

- Q4) Use NAND gates, NOR gates, or combination of both to implement the following logic expressions

$$X = \overline{A}B + \overline{C}D + (A + B)(\overline{A}CD + \overline{B}E) \quad (2)$$

- Q5) Given the 11 bit data word 01101110101, generate the hamming code for odd parity. (2)

- Q6) Design a 32 X 1 multiplexer using 8 X 1 multiplexer (active low enable) and 2 X 4 decoder. (2)