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MID-SEM EXAMINATION (SUMMER SEM. JUNE 2018)

B.Tech 4th Sem. (ECE)

COURESE CODE: 10B11EC401 MAX. MARKS: 50

COURSE NAME: Digital Electronics

COURSE CREDITS: 4 MAX. TIME: 2 Hrs.

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

Q1. Convert $(8FD)_{16}$ into gray and 9's complement formats. **(2.5+2.5=5)**

Q2(a). Subtract 27.50 from 68.75 using the 12 bit 1's complement arithmetic. **(3)**

Q2(b). Given that $16_{10} = 100_b$, find the value of b. **(1)**

Q2(c). What do you mean by a position-weighted system? **(1)**

Q3(a). Given the 8-bit data word 10111001, generate the 12-bit composite word for the Hamming code.

Q3(b). Introduce a 1-bit error in the code word obtained in part a at 11th position, now show the steps to detect and correct this error. Show the error vector and corrected code-word. **(3.5+3.5=7)**

Q4. Find the values of the two-valued variables A, B, C, and D by solving the set of simultaneous equations:

$\bar{A}+AB=0$, $AB=AC$, $AB+A\bar{C}+CD=\bar{C}D$ **(5)**

Q5. Show that $AB + A\bar{B}C + B\bar{C} = AC + B\bar{C}$ **(3)**

Q6. Reduce the following expression using K-map and implement the reduced expression using universal gate and AOI logic.

$F = M(1, 4, 5, 11, 12, 14).\ d(6, 7, 15)$ **(5)**

Q7. Reduce the following expression using K-map and implement the reduced expression using universal gate.

$F = A\bar{B}C + B + B\bar{D} + AB\bar{D} + \bar{A}C$ **(5)**

Q8. Design a BCD to gray code converter. **(5)**

Q9. Design a 4-bit binary parallel adder-subtractor (in one circuit). **(5)**

Q10. Design a parity generator to generate even parity for 3 bit word using 4:1 MUX. **(5)**