KATHMANDU UNIVERSITY
First Internal

Level: UNG/CE/CS_B | **Course: EEEG 202**
Year: II | **Semester: I**
Time: 50 Mins | **F.M.: 10**

Attempt any 4 Question. Calculators are not allowed. [2.5 x 4 = 10]

(2.5)

1. State De-Morgan's theorem. Apply De-Morgan's theorem to each of the following expressions. [1+1+0.5]
   a. $\overline{\overline{(A+B)}\,\overline{(C+D)}\,\overline{(E+F)}\,\overline{(G+H)}}$
   b. $\overline{P(Q+R)}$
2. Define the duality principle with example. Reduce the given Boolean functions. [1+1.5]
   $\bar{B}\bar{C}\,D + \overline{(B+C+D)} + \bar{B}\bar{C}\bar{D}\bar{E}$ (0.5)
3. Write the three different methods to find the 2's complement of a given number. Subtract the following decimals numbers by 9's and 10's complement method respectively. [1+1.5]
   a. $(578.5)_{10} - (288.6)_{10}$ **b.** $(3452.67)_{10} - (42358.74)_{10}$
4. Prove that $(A\bar{B} + A\bar{C})\,(BC + B\bar{C})(ABC) = 0$. Convert the Gray code to the Binary code of the following numbers. [1.5 +1]
   a. $(101101010101)_2$ b. $(100101011111)_2$
5. Convert the following numbers. [2.5]
   a. $(578.897)_{10}$ to hexadecimal number.
   b. $(10101011101.10011)_2$ to decimal number.
   c. $(587.269)_{16}$ to octal number.
   d. $(256.556)_{10}$ to binary number.
   e. $(367.2256)_8$ to decimal number.

Marks: (5-6)