University of Sargodha

BS 2nd Semester/Term Examination 2020

Subject: Computer Science **Course: Digital Logic Design (CSCC-102)**

Time Allowed: 2:30 Hours **(New Course)** **Maximum Marks: 80**

Note: Objective part is compulsory. Attempt any three questions from subjective part.

Objective Part (Compulsory)

Q.1. Write short answers of the following in 2-3 lines each on your answer sheet. (2*16)

i. How many types of number system are there?
ii. State the De Morgan's Theorem?
iii. What are the basic Logic gates?
iv. Define sequential circuit.
v. Convert 471 decimal to binary.
vi. Convert 103 decimal to octal.
vii. Take 15's compliment of 546700 decimal number.
viii. Take 9's compliment of 1291161 binary number.
ix. Convert $(F00EC2)_h$ to binary number.
x. Write the truth table for the function $F = x+x.y+y$
xi. What is the complement of the function $F = x.y + y.x$?
xii. What is graphical symbol for AND Gate?
xiii. What is a register in CPU?
xiv. Reduce A.B.A
xv. What is the application of Flip-flop?
xvi. Define even parity.

Subjective Part (3*16)

Q.2. a) Represent the decimal number 779988 in (a) BCD (b) excess-3 code (c) 2421 code and (d) as a binary number.

b) Discuss the method for conversion of octal to hexadecimal number system.

Q.3. Logic diagrams are drawn with the help of logic gates, discuss all digital logic gates with the help of truth table and the graphical symbols of logic gates.

Q.4. Simplify the following Boolean functions using four-variable maps:

a) $F(a, b, c, d) = \sum(12, 13, 15)$

b) $F(W, X, Y, Z) = \sum(0, 1, 2)$

Q.5. Given the following function.

$F = x\bar{y} + \bar{x}\bar{y}z + \bar{w}xy + \bar{x}y + xy$

a) Obtain the truth table of the function.

b) Obtain the truth table of the function after simplifying expression and show that it is the same as the one in part (a).

Q.6. Convert the following octal numbers to the indicated bases:

a) 6065.15 to decimal

b) 1775.33 to hexadecimal

c) 166.335 to binary

d) 110.11 to octal