Page:
Date: / /

## Assignment-3

Title: Write 64 bit ALP to convert 4-digit Hexe number into its equivalent BCD number and 5 digit BCD number into its equivalent HEX number, make your program wer friendly to accept the choice from wer for

a) MEX to BCD W BCD to HEX O EXIT.

Objective: To learn 1) Data representation and conversion 2) Understand the stack operations.

Outcome: Students will Eludy use of stack operations and number convention in ALP.

Theory:

i) Heradecimal: In this number system the

value of base is 16. This mean that there

are only 16 symbols or possible digit values,

there are 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F where

A,B,C,D,E, and F are scigle bit representations

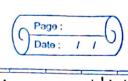
of decimals values 10,11,12,13,14,15 respectively.

It requires only 4 bits to represent value

of any digit. Heradecimal numbers are indicated

by the either a Ox prefin or H suffin.

Bosition of every digit has a weight which is a power of 16. Each position in the Henadecimal system is 16 times more significant than the previous position, that means numeric value of a



heradecimal number is determined by multiplying each digit of the number by the value of the position in which the digit appears and then adding the products. ii) BCD representation There are two types of BCD representation

1) Unpacked BCD representation.
2) Billed BCD representation. In unpacked BCD representation each byte stores the binary equivalent of a decimal digit. For enample the number 12 34 is stored as 01, 02, 03 Ou H In packed BCD representation, each digit is stored using four bits. Two decimal digits are packed into a byte for example the number 1234 is stored as There is no support for multiplication and division is packed BCD representation. ASCII Representation. In ASCII representation decimal minuters are stored as string of ASCII characters. For example the decimal value of 365 H is stored as 33 36 35 H where 33 is ascii for 3,36 is for 6 and 35 is for 5



Different number systems can be used with the computer such as heradecimal, oital, binary and BCD. The number can be converted to any number system from any source to other. Algorithm: Hen to BCD Start ii) More the heradecimal to any 8 bit register iii) Bid Divide the number by OAH iv) Push the remainder to stack. V) Check whether the contents of 8 bit register vi) If yes then goto step iii)
vii) If yes then pop all contents of stack and
display the answer. BCD to Men Initialize Sum=0 Accept the first digit multiplicand

i Multiply the number by 10,000 multiplier.

V) Add result to sum. vi) Repeat the step 2 to 4 till multiplier vii) Display the sum which is result of conventing BUD number to Mex

	Page: Date: / /
11:	Test (ases:
mail to	in the state of th
V <sub>al</sub>	Description Expected Actual Result
	the state of the s
(1	Hen to BCD BCD no Same as Pass
	of 1234 M 4660 expected
2)	BCD to Hen Hex no. Same as Pass
1 1 1 14	of 65335 FFFF expected
15 M	
Fη	And the first and and a second and the second and t
	anclusion:
1	We successfully converted nois from
1 1/1	Mex to BCD and BCD to Men and implemented
31.	learnt about stack operations and MUL and DIV
	instructions.
(	
	The state of the s
4 6	
	The I don't then the
	is the state of th
*- V	