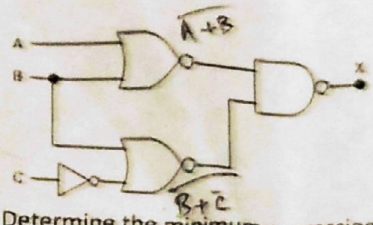
1st year 2nd semester 2016

EEE1202: Digital Logic Design

Marks: 40

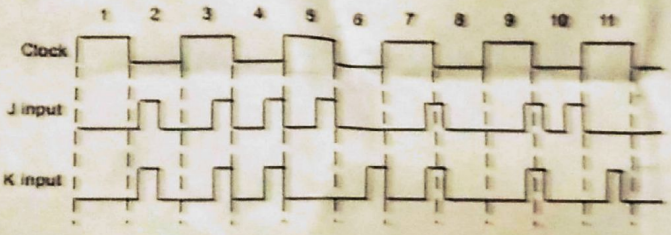
Time: 85 m

1. Covert the binary number 1110100100 into equivalent hex number. 1
2. Subtract 19 from 6 in 2's complement method. 2
3. Construct an X-OR gate using NOR gates only. 2.5
4. Consider a two bit comparator circuit which compares two numbers x (x_2x_1) and y (y_2y_1). If x>y Then output p=1 and q=0, If x<y then output p=0 and q=1 and if x=y then p=q=0. Show the truth table, simplify the expression using Boolean algebra and realize the circuit using logic gates. 7
5. Derive the output x of the following circuit when A=10, B=01 and C=00. 2

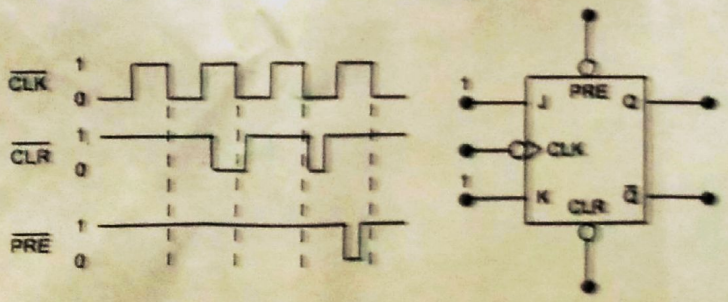


	$\bar{C}\bar{D}$	$\bar{C}D$	CD	$C\bar{D}$
$\bar{A}\bar{B}$	1	0	1	1
$\bar{A}B$	1	0	0	1
AB	0	0	0	0
$A\bar{B}$	1	0	1	1

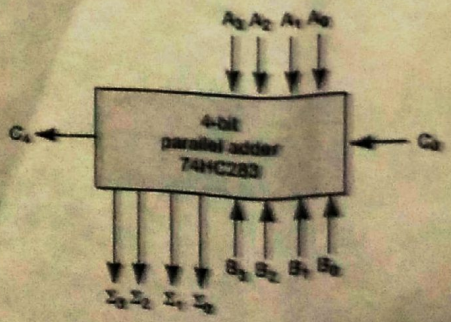
6. Determine the minimum expression for the given K map. 2.5
7. Simplify the expression $\overline{ABCD}$ using DeMorgan's theorems. 1
8. Distinguish between NOR latch and NAND latch. What is the difference between a latch and a FF? 2.5+1
9. Convert a J-K FF into a D FF. 1
10. Define setup time and holding time of a FF. 4
11. The following waveforms are to be applied to a negative edge triggered J-K FF. Draw the Q waveform response assuming Q=0 initially. 2



12. Determine the Q waveform for the following FF: 2



13. Perform BCD addition: 286 and 534. 2
14. Construct an I bit full adder using two 1 bit half adders (show half adder as block). 2
15. How can we use the IC 74HC283 as adder and subtractor both? Show the circuit for only one bit. 2
16. Determine the output (ckt of Q 15) if A=1100, B=1110, SUB=1, ADD=0. Repeat it when ADD=SUB=0. 2.5
17. How can we cascade two ICs to form 8 bit adder/subtractor? 1



Department of Computer Science and Engineering
University of Dhaka

Course: 1123 (Chemistry) Exam: Incourse
Marks: 30 Time: 1 h

Write down the postulates of Bohr's model.	5
Mention the limitations of Bohr's model with required explanations.	5
State Heisenberg uncertainty principle and derive the mathematical expression of it.	5
Deduce deBroglie's equation of the wave nature of an electron.	2.5
Explain the reasons of chemical bond formation.	2.5
Compare the properties of ionic and covalent compounds.	5
Classify hydrogen bonding and exemplify them.	5

CSE, DU

Incourse Examination

Math-1204: Methods of Integration, Differential Equation & series

Time - 1 hour Full Marks - 30

Answer all Question [Marks are indicated in the figure]

1. Evaluate the integrals (any three) $3 \times 5 = 15$

(a) $\int \frac{dx}{x^2\sqrt{1+x^2}}$ (b) $\int \frac{dx}{(x-1)^2(x+2)}$ (c) $\int \sqrt{a^2-x^2}\,dx$ (d) $\int (\ln x)^2 dx$

2. Test the convergency of the integrals $4 \times 2 = 8$

(a) $\int_0^1 \frac{dx}{(x-2)^{2/3}}$ (b) $\int_2^\infty \frac{dx}{\ln x}$

3. Calculate $\int_2^{10} \frac{dx}{1+x}$ by dividing the range -7 into eight equal parts (upto 4 places of decimal)

or

Find the length of the perimeter of the hypocycloid $\left(\frac{x}{a}\right)^{\frac{2}{3}} + \left(\frac{y}{b}\right)^{\frac{2}{3}} = 1$.

University of Dhaka

Department of Computer Science and Engineering

1st Year B. Sc (Hons.) Incourse Examination, 2016

CSE – 1201: Programming Fundamentals

Total Marks: 80 **Time: 70 mins**

1. a) Write a program to take an integer *N* and print all the numbers divisible by either 3 and 7 but not both. [10]

b) Write a program which takes N as input and then print N lines of the following patterns (there is no need to write the program for output 1 if you are going to write for output 2): [8+7]

Input	Output 1	Output 2
5	5 454 34543 123454321	5 454 34543 123454321 2345432 34543 454 5

c) Determine the output of the following C program: [5]

```
1  #include <stdio.h>
2  int main(){
3        int x;
4        char y;
5        x = 71;
6        y = 'S';
7        printf("%c %d",x-1, y+1);
8        return 0;
9  }
10
```

2. a) Determine the output of the following program: [15]

```
9   }
10
```

2. a) Determine the output of the following program: [15]

```
1   int main(){
2       int arr[]={1, 2, 3, 7, 8, 9, 4, 5, 6, 10, 11, 12, 17, 18, 19};
3       int i,j;
4       for(i = 0; i < 5; i = i+2){
5           for(j = 0; j < 3; j = j+1){
6               printf("%d ",arr[(i+j)%15]);
7           }
8           printf("\n");
9       }
10      return 0;
11  }
```

b) Differentiate between pass by reference and pass by value with example. [5]

c) Write the body of the function **void sub_str(char A[], char B[], int P, int L),** job of this function is to copy the substring of length **L** of string A from index **P**, to string **B**. Suppose A = "**abcdefgh**", P = 2 and L = 4, then the substring "**cdef**" is copied to B. [10]

3. a) Determine the output of the following program : [10]

```
1   #include<stdio.h>
2   int main(){
3         int x = 10, y = 20;
4         int z = x > y;
5         x += z++ + --y;
6         y %= ++x;
7         printf("%d%d%d", x, y, z);
8         return 0;
9   }
```

b) There are 9,870 people in a town whose population increases by 10% each year. Write a loop that displays the annual population and determines how many years (count_years) it will take for the population to surpass 30,000. Note that population can be a fraction or rational number. Sample output: [15]

```
Year: 2016     Population: 9870
Year: 2017     Population: 10857
....
....
Total Year: XXXX
```

(c) Given a C program below: [10]

```
1  int main(){
2        int a, b, c;
3        scanf("%d%d%d",&a,&b,&c);
4        if( a > b || b < c && a%10 == 0){
5              printf("A");
6              if( a + b < b + 2*c )
7                    printf("B");
8              else
9                    printf("C");
10       }
11       else if (c + b >= 65 || c + a%5 < 35)
12             printf("D");
13       else{
14             if( c > 55 )
15             printf("E");
16       }
17       if( !(c >= 56 || a < 40))
18             printf("F");
19       if( a - c > c - b || b == 5 ){
20             if( a - 3 < 20 )
21             printf("G");
22             printf("H");
23       }
24       else if ( !(a < 60) )
25             printf("I");
26       printf("\n");
27       return 0;
28 }
```

Determine the output of the program for the following input

i) 5 15 25

ii) 16 1 5

iii) 100 200 -100