

BITS, PILANI-DUBAI CAMPUS
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI
II SEMESTER 2010-2011
COMPREHENSIVE EXAMINATION

COURSE : TA C162 Computer Programming I I YEAR
DURATION : 3 HOURS
WEIGHTAGE : 40% (120 Marks)
Date : 31-05-2011 FN

PART-A

Q1. Consider a 2 dimensional array X of order m x n. For each element X[i][j] in the matrix, the neighboring elements are those which are horizontally and vertically adjacent. Please note, the elements in the corner or in the border of the 2 dimensional arrays may not have all four neighbors.

For example, let X be a 4x3 matrix as shown below in figure-1

The neighbor of X[0][0] are X[1][0] and X[0][1]

The neighbor of X[0][1] are X[0][0], X[0][2] and X[1][1]

The neighbor of X[1][1] are X[1][0], X[1][2], X[0][1] and X[2][1]

Write a C program which takes a matrix order and matrix elements as user input and output a matrix Y[m][n] in which Y[i][j] is the smallest element among the neighbors of X[i][j]. The output Y matrix is shown in figure-2

Matrix X			
[0]	[1]	[2]	
1	2	3	[0]
4	5	6	[1]
7	8	9	[2]
10	11	12	[3]

Figure – 1

Matrix Y			
[0]	[1]	[2]	
2	1	2	[0]
1	2	3	[1]
4	5	6	[2]
7	8	9	[3]

Figure – 2

[15M]

Q2. Write a C program for accepting a multiline string input from user and find out total number of Vowels in the input string.

Ex. If user input is "Computer programming is fun" the output should be

Total no of vowels – 8

[10M]

Q3. What is the difference between a character array and string in C?

[5M]

Q4. Write a C program to print the following pattern, if user input is 5

If user input is 5

```

*   *
 *  *
  *
 *  *
*   *
    
```

If user input is 7

```

*       *
 *     *
  *   *
   *
  *   *
 *     *
*       *
 *     *
  *   *
   *
    
```

[10M]

PART-B

Q1. Design a logical circuit to automatically operate a car alarm. The manual for the alarm gives the following explanation for its operation.

The alarm will go off if the alarm system is activated and any of the two doors (driver door, passenger door) or trunk are open, or if the vibration sensor is activated and the key is not in the ignition.

[8M]

Q2. How many output lines will a 16 input multiplexer have? How many select lines will this multiplexer have?

[4 M]

Q3. Perform the following logical operation. Express your answers in hexadecimal notation.

A) $xAB12 \text{ OR } x78ED$

B) $\text{NOT} ((\text{NOT}(xDE01)) \text{ AND } (\text{NOT}(xEACC)))$

[6M]

Q4. How do you represent -10 in signed magnitude form, 1's complement form and 2's complement form with 5 digit representation?

[6M]

Q5. Implement the RS latch combinational logic circuit using NAND gate and explain its truth table.

[8M]

Q6. For the transistor level circuit given in figure, fill in the truth table for the given inputs A, B, and C.

[8M]

A	B	C	Y
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

PART-C

(Hint: make use of the LC-3 instruction set opcode for the questions below

ADD : 0001 AND : 0101 LD : 0010 LDI : 1010 TRAP : 1111)

Q1. For the instructions **ADD**, **LD** and **JMP**, Write the operations that occur in each phase of the instruction cycle. (Hint: mention the status of registers, MAR, MDR, IR and PC)

[3x3=9M]

Q2. State the phases of the instruction cycle and briefly describe what operations occur in each phase.

[6M]

Q3. Write the **LC-3** instruction for **LDI R5 x1E9**, Draw the relevant data path diagram for the given instruction, given the contents of **PC x0FA1**. The data in **x0F8A** is **FFEE**.

[8M]

Q4. Write the 16 bit TRAP instruction for the following

- a. Halt the program.
- b. Input a character from the keyboard.

[4M]

Q5. Write the **LC-3** instruction for **ADD R3, R7, #-5**. Draw the relevant data path diagram for the given instruction, given the contents of **R7 0FF0**.

[8M]

Q6. Mention all the LC-3 Assembler Pseudo Ops(Assembler directives) and their function.

[5M]

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II SEMESTER 2010-2011

COURSE : TA C162 Computer Programming I I YEAR
COMPONENT : TEST – II (OPEN BOOK)
DURATION : 50 MINS
WEIGHTAGE : 20% (60 Marks)
Date : 10-04-2011

Q1. Write a C program to print the following pattern using 'for' loops

10M

```
*      *
*      *
* * * * *
*      *
*      *
```

Q2. Write a C program for accepting the 'n' number of integers from the user, store those integers in an array. Accept a search integer from the user, search the same in the above array elements. And return the number of occurrences with the position of the search integer in the array.

Ex.

No of integers you want to store: **8**

Enter elements: **19 4 72 12 4 53 4 88**

Enter search integer: **4**

Number of occurrences for the search integer 4 is: **3** at position 2, 5, 7

10M

Q3. A positive integer is entered through the keyboard; write a function to find the binary equivalent of this number.

10M

Q4. Point out the errors

```
main()
{
    int p =23, f=24;
    jiaayjo (&p,&f);
    printf("%d %d", p,f);
}
jiaayjo( int q,int g)
{
    q=q+q;
    g=g+g;
}
```

6M

Q5. Write the output of the following code segment

```
main()
{
    int i=4,j=2;
    add(&i,j);
    printf("%d %d\n",i,j);
}
add(int *i,int j)
{
    *i=**i*i;
    j=j*j;
}
```

4M

Q6. Write the output of the following code segment

```
main()
{
    int i;
    for(i=0, i++, i>=5; i++, i<=10; i+=3)
        printf("%d\n",i);
}
```

5M

Q7. Write the output of the following code segment

```
int main()
{
    int j=1;
    while(j<=255);
    {
        printf("%c %d",j,j);
        j++;
    }
    return 0;
}
```

5M

Q8. Write the output of the following code segment

```
int main()
{
    int x=10,y=100%90;
    int i;
    for(i=1;i<=10;i++);
    if (x!=y);
    printf("x=%d y=%d\n", x, y);
    return 0;
}
```

5M

Q9. Write a program to find sum of only positive integers, when user can input both positive and negative integer numbers. (Use CONTINUE statement)

5M

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II SEMESTER 2010-2011

COURSE : TA C162 Computer Programming I I YEAR
COMPONENT : TEST - I (CLOSED BOOK)
DURATION : 50 MINS
WEIGHTAGE : 25% (75 Marks)
Date : 20-02-2011

Q1. What is the 2's complement for -17, Use 6 bit signed magnitude. Also verify the result obtained.

5M

Q2. Convert the following 2's complement binary number to its equivalent Decimal

- a. 1 1 1 1 0 0 0 0
- b. 0 1 1 1 0 0 0 0

5M+3M

Q3. Convert -105 to its equivalent Binary using 2's complement 8 bit representation.

4M

Q4. Name the different components of the Computer with a neat Diagram; State the purpose of each component.

8M

Q5. Show the output displayed as we run the following program lines when the data entered are 3 and 2

8M

```
main(){
    printf("enter two integer numbers");
    scanf("%d%d", &m,&n);
    m=m+5;
    n=2*n;
    printf("m = %d \nn=%d\n",m,n);
}
```

Q6. What is the output of the following program?

12M

```
main()
{
    char x;
    int y;
    x=65;
    y=67;
    printf("%c\n",x);
    printf("%c\n",y);
    printf("%d\n",x);
}
```

P.T.O.

Q7. `scanf("%d",&num);`

What is the significance of the "&" in the above mentioned statement?

6M

Q8. What will be the output of the below mentioned C program segment. Clearly mention the number of spaces in the formatting, if any.

```
main()
{
    int a=450;
    double b=619.758, c=86.6481;
    printf("\nThe integer value of the variable a is %5d\n",a);
    printf("\nThe double value of the variable b is %1.2f\n",b);
    printf("\nThe double value of the variable c is %6.1f\n",c);
}
```

9M

Q9. Write a C program to find the area of a Circle. Accept the circle radius as user input. Hint: area of circle is $3.14 \times \text{radius} \times \text{radius}$.

15M

IDNO. _____ NAME _____ SEC _____

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II SEMESTER 2010-2011

SET B

COURSE : TA C162 Computer Programming I I YEAR
COMPONENT : QUIZ 1 (CLOSED BOOK)
DURATION : 20 MINS
WEIGHTAGE : 5% (15 Marks)
Date : 14-03-2011

Q1. What will be the output of the below code segment

```
int r=0, s=0, w=12, sum=0;
for(r=1; r<=w; r++)
for(s=r; s<=w; s++)
sum= sum+s;
printf("sum =%d\n", sum);
```

2 M

Q2. Convert the below mentioned "for" loop to it's equivalent "do while" loop

```
int i=0;
for( ;i<10;i+2)
{
    printf("%d\n",i);
}
```

3 M

Q3. What will be the output of the below code segment

```
int x;
for(x=10; x ; x = x-1)
    printf("*");
```

2 M

Q4. What will be the output of the below code segment

```
main()
{
    int i;
    for(i=0;i<=10;i++);
    {
        printf("%d\n",i);
    }
}
```

1 M

Q5. If there are multiple statements to be executed in each case (of Switch), do we need to enclose them within a pair of braces, justify if YES or NO

2M

Q6. What will be the output of the below code segment

```
main()
{
    if(5)
        printf("There is something wrong\n");
    else
        printf("Everything is all right\n");
}
```

1 M

Q7. What will be the output of the below code segment

```
main()
{
    int i=1;
    for(;;)
    {
        printf("%d ",i);
    }
}
```

1 M

Q8. What will be the output of the below code segment

```
main ()
{
    int x = 4, y,z ;
    y = -- x;
    z = x --;
    printf (" \n %d %d %d ", x,y,z);
}
```

1 M

Q9. What will be the output of the below code segment

```
main ()
{
    int k, num = 30;
    k = (num > 5 ? ( num <= 10 ? 100 : 200 ) : 500 );
    printf(" \n %d ", k);
}
```

2 M

BITS, PILANI – DUBAI
SECOND SEMESTER 2010– 2011
ES C 272 ELECTRICAL SCIENCES – II
QUIZ 1 (CLOSED BOOK)

MAXIMUM MARKS: 24
DATE: 08.03.11



WEIGHTAGE: 8%
DURATION: 20 MINUTES

NAME:

ID NO:

1. Evaluate using phasor method $e(t) = 50\sqrt{2} \cos(314t - 30^\circ) - 25\sqrt{2} \cos(314t + 90^\circ)$

Ans: $e(t) =$ _____ [3 MARKS]

2. In a series circuit with $R=10 \Omega$, $X_L = 45 \Omega$, $X_C = 35 \Omega$ and carrying an effective current of 5A, the real power dissipated P _____ and reactive power Q _____ [2 MARKS]

3. The KVA of an ac circuit having KW =100 and KVAR =40 is _____ [2 MARKS]

4. The RMS value of a sinusoidal alternating current is _____ times its maximum value [2 MARKS]

5. A circuit has $X_C= 2000$ ohms if both its capacitance and frequency are doubled its reactance will become _____ [2 MARKS]