M.Marks: 20 **Time : 90 Minutes**

NOTE:

- All sections are compulsory
- Attempt the questions **strictly** in sequential order.
- Answers should be justified & to the point

SECTION A [4*1.5=6 Marks]

Assume library (#include<stdio.h>,#include<string.h>, #include<math.h>), and return 0 and main function if missing. Give the outputs of the following program segments assuming 32 bit compiler. Justify your output through explanation.

1. What is the output printed by the following C code? Justify your answer.

```
#include<stdio.h>
int main ( ) {
        int theNum, total;
        total = 1;
        theNum = 5;
        while (theNum > 1) {
                total *= --theNum;
        }
        printf ("%d", total);
        return 0;
}
```

2. Predict the output of the following program.

```
#include<stdio.h>
int main ( ) {
        char c;
        for (c='a'; c<'g'; ++c) {
 switch (c) {
    case 'a':   c += 2;
    case 'c':   c += 1;
    case 'g':    ++c;
                printf ("%c\n" , c-- );
default:      ++c;
                }
        printf ("*** %c\n" , c);
        }
        return 0;
        }
```

3. Predict the output of the following program.

```
#include<stdio.h>
int main(){
   int a=5,b=10,x;
   if((a<++a||b<++b&&b<a++)?x=a|b:b)
      printf("%d%d%d",a,b,x);
   else
      printf("John Terry");
}
```

4. Predict the output of the following program.

```
#include<stdio.h>
int main()
{  int i,a,b,sum;
 for(i=10;i<100;i++)
 {      a=i/10;      b=i%10;      sum=a+b;
  if(b==(a-4) && (i/sum) ==7)
   printf("%d\n",i);
 }
  return 0;
   }
```

SECTION B: (Attempt any two questions) Marks (2*3=6)

1. Write a program in C for power set. Power set P(S) of a set S is the set of all subsets of S. For example S = {1, 2, 3} then P(s) = {{}, {1}, {2}, {3}, {1, 2}, {1, 3}, {2, 3}, {1, 2, 3}}. If S has n elements in it then P(s) will have 2^n elements.
2. Given a binary array and an integer **m**, find the position of zeroes flipping which creates maximum number of consecutive 1s in an array. Write a program in C for finding zeroes to be flipped so that number of consecutive 1's is maximized.

For examples:

Example1:

Input: arr[] = {1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1}
m = 2
Output: 5 7
We are allowed to flip maximum 2 zeroes. If we flip arr[5] and arr[7], we get 8 consecutive 1's which is maximum possible under given constraints

Example2:

Input: arr[] = {1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1}
m = 1
Output: 7
We are allowed to flip maximum 1 zero. If we flip arr[7], we get 5 consecutive 1's which is maximum possible under given constraints.

Example3:

Input: arr[] = {0, 0, 0, 1}
m = 4
Output: 0 1 2
Since m is more than number of zeroes, we can flip all zeroes.

3. An array of size N is given, N is even. In this array one entry is repeated $n/2$ times and the remaining $n/2$ entries are unique. Write a program in C to find the repeated value.

SECTION C: Marks (4+2+2=8 Marks)

1. Write short notes with example.
   a) continue and break
   b) Type conversion and Type casting

2. How to access 2 dimensional array's elements using pointer? Explain.
3. When a switch statement is better than multiple if statements? Show with an example.