Department of Computer Science and Engineering
Indian Institute of Technology Patna

```
Course:CS101
Time:  120 minutes
```

Mid Sem Exam
Full Marks 100

`Roll No:` ------------ Signature: ------------------

Answer in the question paper itself. Rough work can be done in the supplementary sheets.

1. Answer each of the followings. $(10 \times 3) = 30$

(a) Consider the following program-

```
int main()
{
   char A[][3] = {{'a','b','c'},{'d','e','f'}};
   /*assume base address of A[][] is 60508*/
   printf("\n Address of A[1] is %u ",A[1]);
   return 0;
}
```

What would be a possible output to the above program?
Option a: 60508 **Option b:** 60509
Option c: 60510 **Option d**: 60511
Answer:

Justification:----------------------------------

(b) What is printed by the following program?

```
#include <stdio.h>
int main ()
{
   int x = 1, y = 2;
   printf(" %d %d \n",x/y*100, 100*x/y);
   return 0;
}
```

Answer:

Justification:----------------------------------

(c) What the following two functions will compute?

```
int fun ( unsigned int a , unsigned int b )
{
    if ((a == 0) || (b == 0)) return 0;
    return a * b / rfun(a,b);
}

int rfun ( unsigned int a , unsigned int b )
{
    if (b == 0) return a;
    return rfun(b,a%b);
}
```

Answer:

Justification:----------------------------------

(d) What is printed by the following program?

```
#include <stdio.h>
int main ()
{
   printf("\n%d ",'a' - 'd');
   return 0;
}
```

Answer:

Justification:----------------------------------

(e) What will be printed after execution of the following code segment?

```
char c = 'b';
switch(c){
case 'b': printf("Blue ");
case 'r': printf("Red ");
case 'g': printf("Green ");
break;
case 'y': printf("Yellow ");
default: printf("Other ");
}
```

Answer:

Justification:----------------------------------

(f) What the following program will print?

```
#include<stdio.h>
int main()
{
  int i = 1;
  int c = 'c';
  while (++i<5)
  {
    c++;
    printf("%c-",c+i);
  }
  printf("\n");
  return 0;
}
```

(59)

Answer:

Justification:------------------------------------

(g)
```
#include<stdio.h>
int main()
{
  int i=5;
  printf("%d", i=++i==6);
  return 0;
}
```

Answer:

Justification:------------------------------------

(h) What the following program will print?

```
#include<stdio.h>
int main()
{
  int add(int, int), a, b;
  a=10; b=20;
  printf(Result=%f,
          (float)add(a,b)/add(a,b));
  result 0;
}

int add(int a, int b)
{
  int c;
  c=a+b;
  a=30;
  b=30;
  return(c);
}
```

Answer:

Justification:------------------------------------

(i) What will be the output of the following program?

```
#include<stdio.h>
int main()
{
  float fun(int*, int*);
  int a, b;
  a=10; b=20;
  printf("Result=%0.2f",
          fun(&a, &b)/fun(&b, &a));
  result 0;
}

float fun(int *a, int *b)
{
  float c;
  c=*b-*a;
  *a=30;
  *b=60;
  return(c);
}
```

Answer:

Justification:------------------------------------

(j) What is printed by the following program?

```
#include<stdio.h>
int main()
{
  char *names[]={"Ani","James","Harry"};
  int i; char *t;
  t=names[2];
  names[2]=names[1];
  names[1]=t;
  for(i=0;i<=2;i++)
  printf("%s\n", names[i]);
  return 0;
}
```

Answer:

Justification:------------------------------------

----

2. For each of the following program/program segment/function, point out if there is any error. $(10 \times 3) = 30$

(a)
```
void main()
{
  const int a=12;
  a++;
  printf("%d %d",a,++a);
}
```

Answer:

Justification:------------------------------------

(b)
```
void main()
{
  long int a,b=10;
  ++a=b++;
  printf("%d %d",a,b);
}
```

Answer:

____

Justification:______________________________

____

(c)
```
void main()
{
  int x=5;
  int y=10;
  &x=y;
  printf("%d %d",x,y);
}
```

Answer:

____

Justification:______________________________

____

(d)
```
int main()
{
    struct site
    {
        char name[] = "GeeksQuiz";
        int no_of_pages = 200;
    };
    struct site ptr;
    printf("%d ", ptr.no_of_pages);
    printf("%s", ptr.name);
    getchar();
    return 0;
}
```

Answer:

____

Justification:______________________________

____

(e)
```
#include <stdio.h>
int main()
{
    int c = 5, no = 10;
    do {
        no /= c;
    } while(c--);

    printf ("%d\n", no);
    return 0;
}
```

Answer:

____

Justification:______________________________

____

(f)
```
#include<stdio.h>
void main()
{
    int a=5,b=10,c=1;
    if(a&&b>c){
        printf("This is the MidSem");
    }
    else{
        break;
    }
}
```

Answer:

____

Justification:______________________________

____

(g)
```
#include <stdio.h>
int main()
{
   int a[5] = {1, 2, 3, 4, 5};
   int i;
   for (i = 0; i < 5; i++)
      if ((char)a[i] == ’5’)
        printf("%d\n", a[i]);
      else
        printf("FAIL\n");
}
```

Answer:

____

Justification:______________________________

____

(h)
```
#include <stdio.h>
    void main()
    {
        double ch;
        printf("enter a value btw 1 to 2:");
        scanf("%lf", &ch);
        switch (ch)
        {
        case 1:
            printf("1");
            break;
        case 2:
            printf("2");
            break;
        }
    }
```

Answer:

____

Justification:______________________________

____

(i)
```
#include <stdio.h>
void main()
```

(60)

```
{
    int k = 0;
    for (k < 3; k++)
      printf("Hello");
}
```

Answer:

Justification:-----------------------------------

(j)
```
#include <stdio.h>
void foo()
{
    return 1;
}
void main()
{
    int x = 0;
    x = foo();
    printf("%d", x);
}
```

Answer:

Justification:-----------------------------------

----

3. Complete the C function for each of the followings-

(a) The following C function that will take two positive integers as arguments and will compute *gcd* of those two numbers using recursion.
(4)

```
int gcd(unsigned int m, unsigned int n)
{
  if (n!=0)


    return --------------------------;

    /*provide a recursive call with
    proper arguments*/


  else


    return --------------------------;

    /*provide a proper return value*/
}
```

(b) When the following C-function *fRound* receives a positive floating-point number x as a parameter, it should return the rounded value of x to two decimal places. For example, *fRound*(248.765012) = 248.77, *fRound*(248.763000) = 248.76, *fRound*(248.764805) = 248.76. In the code for *fRound* shown below, the parts indicated by dashed line have been left out for you to fill up.
(6)

```
float fRound(float x)
{

  float y, fraction;


  int wholeNumber;


  y = --------------------------------


      --------------------------------;


  wholeNumber=(int)y;

  fraction=y-(float)wholeNumber;


  if (-------------------------------


      -------------------------------)

    wholeNumber=wholeNumber+1;


  return -----------------------------

         -----------------------------;
}
```