Indian Institute of Technology Patna
Date: 25 Feb 2019
Mid Sem Exam: CS102: Programming & Data Structure

**Instruction**: Q1-15, 4 marks each. 1 mark will be deduced for each wrong answer. Q16-25, 4 marks each. No negative marking. All options should be written on the table provided in the last page. Evaluation will be based only on that table. Assume *#include < stdio.h >*for all questions. No doubts would be entertained. Write suitable assumptions, if necessary.

Time: 2 hours Full Marks 50

Q(I) **Mark Correct Choice**

```
void main()
{
  int a=10;
  void f();
  a = f();
  printf("%d\n", a);
}
void f()
{
  printf("Hi");
}
```

(A) Error: Not allowed assignment
(B) Doesn't print anything
(C) No error
(D) None of above

Q(II) **Mark Correct Choice**

```
int f(int a)
{
  a > 20? return(10): return(20);
}
void main()
{
  int f(int);
  int b;
  b = f(20);
  printf("%d\n", b);
}
```

(A) Error: Prototype declaration
(B) No error
(C) Error: return statement cannot be used with conditional operators
(D) None of above

Q(III) **Mark Correct Choice**

```
void main()
{
  int i = 3,j=1;

  switch (i +j)
  {
    case 4: printf("Even");
      break;
    case 3: printf("Odd");
      break;
    default: printf("Default");
  }
}
```

(A) Odd
(B) Even
(C) Default
(D) Compilation Error

Q(IV) **There is a error in the below program. Which statement will you add to remove it?**

```
void main()
{
  int a;
  a = f(10, 3.14);
  printf("%d\n", a);
}
float f(int aa, float bb)
{
  return ((float)aa + bb);
}
```

(A) Add prototype: float f(aa, bb)
(B) Add prototype: float f(int, float)
(C) Add prototype: float f(float, int)
(D) Add prototype: float f(bb, aa)

Q(V) **Mark Correct Choice**

```
void main()
{
  int a[3] = {1, 2, 3};
  int *p = a;
  printf("%p\t%p", p, a);
}
```

(A) Same address is printed
(B) Different address is printed
(C) Compile time error
(D) Nothing

Q(VI) **Mark Correct Choice**

```
void foo( int[] );
void main()
{
  int ary[4] = {1, 2, 3, 4};
  foo(ary);
  printf("%d ", ary[0]);
}
void foo(int p[4])
{
  int i = 10;
  p = &i;
  printf("%d ", p[0]);
}
```

(A) 10 10

(B) Compile time error

(C) 10 1

(D) Undefined behavior

Q(VII) **Mark Correct Choice**

```
void main()
{
  int ary[4] = {1, 2, 3, 4};
  int *p = ary + 3;
  printf("%d\n", p[-2]);
}
```

(A) 1

(B) 2

(C) Compile time error

(D) Some garbage value

Q(VIII) **Mark Correct Choice**

```
int reverse(int);
void main()
{
  int no=5;
  reverse(no);
}
int reverse(int no)
{
  if(no == 0)
    return 0;
  else
    printf("%d,", no);
  reverse (no--);
}
```

(A) Print 5, 4, 3, 2, 1

(B) Print 1, 2, 3, 4, 5

(C) Print 5, 4, 3, 2, 1, 0

(D) Infinite loop

Q(IX) **Mark Correct Choice**

```
int addmult(int ii, int jj)
{
  int kk, ll;
  kk = ii + jj;
  ll = ii * jj;
  return (kk, ll);
}
void main()
{
  int i=3, j=4, k, l;
  k = addmult(i, j);
  l = addmult(i, j);
  printf("%d %d\n", k, l);
}
```

(A) 12 12

(B) No error, No output

(C) Error: Compile error

(D) None of above

Q(X) **Mark Correct Choice**

```
int func1(int);
void main()
{
  int k=35;
  k = func1(k=func1(k=func1(k)));
  printf("k=%d\n", k);
}
int func1(int k)
{
  k++;
  return k;
}
```

(A) k=35

(B) k=36

(C) Compiler Error

(D) k=38

Q(XI) **Mark Correct Choice**

```
void main()
{
  int x = 5;
  printf("%f", x/2.0);
}
```

(A) 2

(B) 2.000000

(C) 2.500000

(D) Compile Time Error.

Q(XII) How many correct variable names are in given list,

```
{_age, age_*, 1age, age, _}
```

(A) 2

(B) 4

(C) 1

(D) 3

Q(XIII) **Mark Correct Choice**

```
void main()
{
  int a=10;
  if(a==10)
  {
    printf("Hello...");
    break;
    printf("Ok");
  }
  else
  {
    printf("Hii");
  }
}
```

(A) Hello...

(B) Hello...Ok

(C) Hii

(D) Compile Time Error

Q(XIV) **Mark Correct Choice**

```
void main()
{
  int x=22;
  if(x=10)
    printf("TRUE");
  else
    printf("FALSE");
}
```

(A) TRUE

(B) FALSE

(C) Error

(D) Prints Nothing

Q(XV) **Mark Correct Choice**

```
void main()
{
  if(!printf(""))
    printf("Okkk");
  else
    printf("Hiii");
}
```

(A) Okkk

(B) Hiii

(C) Compile Time Error

(D) Prints Nothing

Q(XVI) **Mark Correct Choice**

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

(A) Prints Nothing

(B) Hello is printed thrice

(C) Compile Time Error

(D) Hello is printed infinite times

Q(XVII) **Mark Correct Choice**

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

(A) 0

(B) 1

(C) 5

(D) Compile Time Error

Q(XVIII) **Mark Correct Choice**

```
void main()
{
  int i = 1, 2, 3;
  printf("%d", i);
}
```

(A) 1

(B) 2

(C) 3

(D) Compile Time Error

Q(XIX) **Mark Correct Choice**

```
void main()
{
  printf("value is = %d",(10++));
}
```

(A) 10

(B) 11

(C) Compile Time Error

(D) Prints Garbage Value

Q(XX) **Mark Correct Choice**

```
void main()
{
  int a=10,b=2,x=0;
  x=a+b*a+10/2*a;
  printf("value is =%d",x);
}
```

(A) 1250

(B) 80

(C) 125

(D) Error

Q(XXI) **What will be the result of running this program?**

```
#include <stdio.h>
void main()
{
  int a[][] = {{1,2},{3,4}};
  int i, j;
  for (i = 0; i< 2; i++)
    for (j = 0; j < 2; j++)
      printf("%d ", a[i][j]);
}
```

Output:

Q(XXII) **What will be the output of the following program?**

```
#include<stdio.h>
void foo(int n, int sum)
{
  int k = 0, j = 0;
  if (n == 0) return;
  k = n % 10;
  j = n / 10;
  sum = sum + k;
  foo (j, sum);
  printf ("%d,", k);
}
void main ()
{
  int a = 2048, sum = 0;
  foo (a, sum);
  printf ("%d\n", sum);
}
```

Output:

(XXIII) **What will be output of the following program?**

```
#include<stdio.h>
int f(int n, int k)
{
  if (n == 0)
    return 0;
  else if (n % 2)
    return f(n/2, 2*k) + k;
  else return f(n/2, 2*k) - k;
}
void main ()
{
  printf("%d", f(19, 1));
}
```

Output:

(XXIV) **Convert decimal $(71)_{10}$ into binary form. Show the steps.**

(XXV) **Convert Hex $(1E6)_{16}$ into decimal form. Show the steps.**

| Question # | Option #/Output |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| ******** | ********** |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| Output 21 | |
| Output 22 | |
| Output 23 | |
| 24 | |
| 25 | |

Name (in Capital): _____

Roll No: _____

Signature:

Invigilator's Signature: _____

**For Office Use:**

| Correct A (1-15) | Wrong A (1-15) | Correct A (16-25) | Total(100) |
|---|---|---|---|
| | | | |
| $*4$ | $*-1$ | $*4$ | |