



JK Lakshmipat University Jaipur

BCA - III Semester
Programming - II (C) CS1135
Final Exam

Time: 2 hours

14 Dec 2023

Max Marks: 30

Instructions

- There are a total of 7 questions consisting of multiple parts printed on all 4 sheets of this paper. Attempt all questions.
- Read the questions and the codes provided with them very carefully.
- In case of any doubt, make your assumption, write it clearly and continue.

1) Answer the following:

- a) For building a C program we need three different stages: compilation, linking and preprocessing. Mention the order in which these three stages occur.
- b) At which stage do macros defined by `#define` get expanded?

$1 \times 2 = 2$ marks [CO6]

2) Consider the following program:

```
#define TEST(a) a*a
int func(x);
int main(){
    int a=TEST(2);
    int b=TEST(2+3);
    int c=func(a);
}
```

- a) Is the second line in this code a function declaration or a function definition?
- b) Will this program by itself build successfully? If not, at what stage will you get an error?
- c) What value will the variable `a` be assigned after macro expansion?
- d) What value will the variable `b` be assigned after macro expansion?

$1 \times 4 = 4$ marks [CO2,6]

3) What are the values of a and b after running the code snippets shown below:

(a) int a=10; int b=20; if(b%a){ a=a+b; }else{ b=a+b; }	(b) int a,b; for(a=20,b=100;a<b;a=a+5) b=b-10;	(c) int l[3]={10,20,30}; int* p=l+1; int a=*p; int b=p[1];	(d) double a=5/2+3/2; int b=25/ 3+3;
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1 × 4 = 4 marks [CO2,3]

4) Consider the code shown below:

```
typedef struct Person{
    char *name;
    int age;
}Person;
Person x[3]={{'John',45},{'Peter',50},{'Charles',25}};
Person *p1=x;
Person *p2=&x[2];
```

For each statement below tell whether it will compile without error. If yes, what will it print?

- a) printf("%s",x.name);
- b) printf("%s",p1->name);
- c) printf("%s",(*x).name);
- d) printf("%s",p2->name);
- e) printf("%s",p1+1.name);
- f) printf("%c",p1[2].name[1]);

0.5 × 6 = 3 marks [CO2,3]

5) What will be the output of the code below:

```
#include <stdio.h>

int x=100;
int y=20;
void func1(int x){
    x++;
    y++;
    static int z=30;
    z++;
    printf("Func1:%d,%d,%d\n",x,y,z);
}

int main()
{
    func1(25);
    func1(105);
    printf("Main:%d,%d\n",x,y);
}
```

4 marks [CO2,3]

6) Consider the following incomplete code snippet:

```
char *s1="Examination";
char s2[20]="Final";
_____ar[2]={s1,s2};
_____p = ar;
```

a) Complete the 3rd and 4th lines above so that it is correct (you have to find the proper way to declare variables ar2 and p);

b) What will the following statements do. If the statement is an error write it is an error, otherwise write what will it print.

(i) `printf("%c",**p);`

(ii) `printf("%s",*p);`

2 + 2 = 4 marks [CO2,3]

7) Write the following code:

a) Without using any `math.h` library function, write a C function called `func` that takes an integer and returns the closest perfect square to it. Note that the closest perfect square can be bigger than or smaller than or the same as the number.

e.g: `func(25)` should be 25 because 25 is itself a perfect square
`func(50)` should be 49, `func(140)` should be 144.

b) Write a C program that computes the following sum up to 25 terms:

$$\frac{1}{2} + \frac{1 \times 2}{3^2} + \frac{1 \times 2 \times 3}{4^3} + \frac{1 \times 2 \times 3 \times 4}{5^4} + \dots$$

c) Write a C function that takes a 7 by 7 int matrix and prints the sum of each column of the matrix.

3 × 3 = 9 marks [CO1,2,3]