

UNIT 5

Question Bank

2016-17

1. What do you mean by dynamic memory allocation? Explain malloc() and calloc() function in detail.
2. Parameter passing mechanism (Pass by value and Pass by Reference)
3. List out various file operations and modes in C. Write a program to copy the content from one file to another file.
4. What do you mean by macro? Explain types of macro with its example.
5. What do you mean by pointers? How pointer variable are initialized? Write a program to sort given numbers using pointers

2015-16

1. Parameter passing mechanism (Pass by value and Pass by Reference) with suitable example
2. Describe the relation between structures and pointers
3. What are preprocessor directives? Explain any three of them
4. Suppose a file contains records with each record containing name and age of a student. Write a 'C' program to read these records and display them in sorted order by name.
5. What is void pointer? How is it different from other pointers.
6. Write a program in C to reverse a string through pointer.
7. What are various types of files that can be created in C language? Also give different modes in which these files can be used with proper syntax. Write a program in C to append some text at the end of an existing text file.
8. List out various file operations in C. Write a program to count number of characters in a file.

2014-15

1. What do you mean by dynamic memory allocation?
2. Explain the following functions in detail
 - a. free
 - b. calloc
3. State the features of pointers. Write a 'C' program to sort a given numbers using pointers.
4. List out various file operations in 'C'. Write a C program to count number of characters in a file.

Questions Prior To 2014-15:

1. Define double pointer with example.
2. Write short note on Macros with suitable example.
3. Explain the following: Preprocessor, Conditional Operator.
4. Write a program in C to copy content from one file to another file.
5. Write the difference between call by value and call by reference with suitable example. [2013-14], [2012-13], [2008-09]
6. What is pointer arithmetic? Write advantage and disadvantage of using pointer variable. [2012-13]
7. Write short notes on: Macros, Linked List, and Mathematical Function. [2012-13]

8. Dynamic memory allocation. [2011-12]
9. Macros. How they are different from C variables. Advantage of macro. Explain conditional compilation and how does it help the programmers. [2011-12]
10. Pointers. Declare, initialize. Swap program. [2011-12]
11. Create a file integer and store integers from 1 to 20. Now create two files even and odd. Read the integer file and store even numbers in even file and odd numbers in odd file. Finally display the contents of all the three files. [2011-12]
12. What is dynamic memory allocation? Explain *malloc()* with example. [2008-09]
13. Write a program in C that takes ten integers from a file and write square of these integers into another file

Solution of Unit 5 Question Bank

2016-17

1. What do you mean by dynamic memory allocation? Explain *malloc()* and *calloc()* function in detail.
Ans. Refer book/notes
2. Parameter passing mechanism (Pass by value and Pass by Reference)
Ans. Refer book/notes. (Topic was covered in Unit 3)
3. List out various file operations and modes in C. Write a program to copy the content from one file to another file.
Ans. Various file operations and modes- Refer book/notes
Program:

```
#include <stdio.h>
#include <stdlib.h>
void main()
{
    FILE *fp1,*fp2;
    char c;
    fp1=fopen("test","r");
    fp2=fopen("testCopy","w");
    if(fp1==NULL || fp2==NULL)
    {
        printf("Error opening files\n");
        exit(1);
    }
    while((c=getc(fp1))!=EOF)
    {
        putc(c,fp2); //To write c in file pointed by fp2
    }
    fclose(fp1);
    fclose(fp2);
}
```
4. What do you mean by macro? Explain types of macro with its example.
Ans. Refer book/notes.
5. What do you mean by pointers? How pointer variable are initialized? Write a program to sort given numbers using pointers
Ans. For first two parts refer book/notes

Suppose we have an array a and a pointer p storing the base address of a :

```
int a[10]={2,1,4,5,6,10,9,7,8,12};
```

```
int *p=a; //p is storing base address (starting address of a)
```

Now writing $a[i]$ to access i^{th} element of a is equivalent to writing $*(p+i)$ due to the properties of pointer arithmetic.

Program:

```
#include<stdio.h>
```

```
void main()
```

```
{
```

```
    int a[100],N,*p,i,l,t;
```

```
    printf("Enter the size of the array: ");
```

```
    scanf("%d",&N);
```

```
    printf("Enter array elements\n");
```

```
    for(i=0;i<N;i++)
```

```
        scanf("%d",&a[i]);
```

```
    p=&a[0]; //or we can write p=a
```

```
    /* Bubble sort algorithm */
```

```
    for(l=N-1;l>0;l--)
```

```
    {
```

```
        for(i=0;i<l;i++)
```

```
        {
```

```
            if(*(p+i)>*(p+i+1))           //equivalent to if(a[i]>a[i+1])
```

```
            {
```

```
                t=*(p+i);                 //equivalent to t=a[i]
```

```
                *(p+i)=*(p+i+1);          //equivalent to a[i]=a[i+1]
```

```
                *(p+i+1)=t;               //equivalent to a[i+1]=t
```

```
            }
```

```
        }
```

```
    }
```

```
    printf("Sorted array is\n");
```

```
    for(i=0;i<N;i++)
```

```
        printf("%d\n",a[i]);
```

```
}
```

2015-16

1. Parameter passing mechanism (Pass by value and Pass by Reference) with suitable example

Ans. Refer unit 3 notes/book

2. Describe the relation between structures and pointers

Ans. We can create a pointer variable to store pointer to a structure variable. Also we can have pointer variables as member of structure.

```
struct student
```

```
{
```

```
    int id;
```

```
    char name[10];
```

```
    int marks;
```

```
}s={1,"Priyank",30}, *p=&s;
```

here s is a structure variable and p is a pointer variable of student and p is storing the starting address of s.

3. What are preprocessor directives? Explain any three of them

Ans. Refer book/notes

4. Suppose a file contains records with each record containing name and age of a student. Write a 'C' program to read these records and display them in sorted order by name.

This question involves concept of arrays, structures, sorting and file handling. The solution will be provided online at- www.luckyexperience.com

5. What is void pointer? How is it different from other pointers.

Ans. A void pointer (also called generic pointer) is a special pointer variable that can store pointer to any datatype variable. However unlike normal pointer variables, we cannot dereference it directly; we first need cast it to an appropriate pointer type, only then we can dereference it. E.g.,

```
int x=5;
```

```
void *p=&x;
```

```
printf("%d\n", *(int *)p); //typecasting p into appropriate pointer type
```

6. Write a program in C to reverse a string through pointer.

```
#include<stdio.h>
```

```
#include<string.h>
```

```
void main()
```

```
{
```

```
    char str[10],*ptr;
```

```
    int l,i;
```

```
    gets(str);
```

```
    ptr=str; //Storing the base address of str into pointer ptr
```

```
    l=strlen(str);
```

```
    for(i=l-1;i>=0;i--)
```

```
        printf("%c",*(ptr+i));
```

```
}
```

7. What are various types of files that can be created in C language? Also give different modes in which these files can be used with proper syntax. Write a program in C to append some text at the end of an existing text file.

Ans. For first two parts refer book/notes. Program:

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
void main()
```

```
{
```

```
    FILE *fp;
```

```
    char str[100];
```

```
    fp=fopen("sample.txt","a");
```

```
    if(fp==NULL)
```

```
    {
```

```
        printf("Error opening file\n");
```

```
        exit(1);
```

```
    }
```

```
    printf("Enter text to append: \n");
```

```
    gets(str);
```

```
    fputs(str,fp);
```

```

        fclose(fp);
    }

```

8. List out various file operations in C. Write a program to count number of characters in a file.

Ans. For first part refer book/notes. Program:

```

#include<stdio.h>
#include<stdlib.h>
void main()
{
    FILE *fp;
    char c;
    int count=0; //to store character count
    fp=fopen("sample.txt","r");
    if(fp==NULL)
    {
        printf("Error opening file\n");
        exit(0);
    }
    while((c=getc(fp))!=EOF)
    {
        count++;
    }
    printf("Total character count is %d\n", count);
    fclose(fp);
}

```

2014-15

- What do you mean by dynamic memory allocation?
Ans. Refer book/notes
- Explain the following functions in detail
 - free
 - calloc
 Ans. Refer book/notes
- State the features of pointers. Write a 'C' program to sort a given numbers using pointers.
Ans. Refer book/notes. Program already solved above.
- List out various file operations in 'C'. Write a C program to count number of characters in a file.
Ans. Refer book/notes. Program already solved above.

Questions Prior to 2014-15:

Most of the questions are theoretical so refer notes/book for them.

11. Create a file integer and store integers from 1 to 20. Now create two files even and odd. Read the integer file and store even numbers in even file and odd numbers in odd file. Finally display the contents of all the three files. [2011-12]

Ans. Program
#include <stdio.h>

```

#include <stdlib.h>
int main()
{
    FILE *fp1,*fp2,*fp3;
    int i;
    fp1=fopen("integers.txt","w+");
    fp2=fopen("even.txt","w+");
    fp3=fopen("odd.txt","w+");
    if(fp2==NULL|| fp2==NULL || fp3==NULL )
    {
        printf("Error opening files\n");
        exit(0);
    }
    for(i=1;i<=20;i++)
    {
        fprintf(fp1, "%d\n",i );
    }
    rewind(fp1);
    while(fscanf(fp1,"%d",&i)==1)
    {
        if(i%2==0)
            fprintf(fp2, "%d\n",i );
        else
            fprintf(fp3, "%d\n",i );
    }
    rewind(fp1);
    rewind(fp2);
    rewind(fp3);
    printf("Contents of File 1 are\n");
    while(fscanf(fp1,"%d",&i)==1)
    {
        printf("%d\n",i);
    }
    printf("Contents of File 2 are\n");
    while(fscanf(fp2,"%d",&i)==1)
    {
        printf("%d\n",i);
    }
    printf("Contents of File 3 are\n");
    while(fscanf(fp3,"%d",&i)==1)
    {
        printf("%d\n",i);
    }
    fclose(fp1);
    fclose(fp2);
    fclose(fp3);
}

```

13. Write a program in C that takes ten integers from a file and write square of these integers into another file.

Ans. Program:

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    FILE *fp1,*fp2;
    int i,v;
    fp1=fopen("integers.txt","r");
    fp2=fopen("squareIntegers.txt","w");
    if(fp1==NULL || fp2==NULL)
    {
        printf("Error opening files\n");
        exit(0);
    }
    for(i=1;i<=10;i++)
    {
        fscanf(fp1,"%d",&v);
        fprintf(fp2,"%d\n",(v*v));
    }
    fclose(fp1);
    fclose(fp2);
}
```