Adv C Module

1. Subjective

2.1 Basic Refreshers

1. What is mean by overflow.
2. Can the size of datatypes be changed
3. char var=600; is the statement correct?
4. List the difference between the while and do-while loop.
5. Difference between Logical and Bitwise operator
6. int var=0x12345678; explain your approach to extract 34 and write the code.
7. Type conversion(implicit and explicit) Why implicit type conversion happen give an example.
8. What is the use of register? what is the difference between auto and register?
9. What will be the output of the program? If there is any error,
10. Data types and their size?
11. List out the types of qualifiers
12. How the negative numbers are stored
13. What are format specifiers
14. What is variable declaration, definition and initialisation?
15. char var=600; is the statement correct?
16. Explain about constant keyword. Explain with an example
17. How to change the variable value if the variable is declared with const?
18. What is address (basic of addressing)?
19. Different types of datatypes in C
20. what is the error and what is the reason

```
#include<stdio.h>
int main()
{
        int i=32, j=0x20, k, l, m;
       k=i|j;
       l=i&j;
       m=k^l;
```

```
        printf("%d, %d, %d, %d, %d\n", i, j, k,l, m);
        return 0;
}
```

21.
```
#include <stdio.h>

int main() {
   int a=256;
   char ptr=(char)&a;
   printf("%d\n",*ptr);

   return 0;
}
```

22.
```
#include <stdio.h>

int main() {
   struct temp
   {
      int i,j,k,l;
   }
   struct temp var={1,2,3};
   printf("%d, %d, %d, %d\n",var.i,var.j,var.k,var.l);

   return 0;
}
```

23.
```
#include <stdio.h>
union
{
   char ch;
   int a[10];
}abc;
int main()
{
   printf("%d\n",sizeof(abc))    ;
}
```

24.
```
#include <stdio.h>

int main()
```

```
{
   printf("%d\n",sizeof("hello"))    ;
}
```

25.
```
#include <stdio.h>
int* fun()
{
   int a=10;
   return &a;
}
int main()
{
   int *ptr=NULL;
   ptr=fun();
   printf("%d\n",*ptr);
}
```

26.
```
#include <stdio.h>

int main()
{
   printf("%d\n",10^2);
   printf("%d\n",10&2);
   printf("%d\n",10!1);
}
```

27.
```
#include <stdio.h>
int main()
{
   int arr[5];
   printf("0x%X\n",arr+1);
   printf("0x%X\n",&arr+1);
   return 0;
}
```

28.
```
#include <stdio.h>
#define max 20
int main()
{
  #define max 10
   printf("%d\n",max);
```

```
}
```

29. What are qualifiers? explain different qualifiers in C.
30.
```
#include <stdio.h>

int main() {
   char *ptr="helloworld";
    printf("%s\n",ptr+4);

    return 0;
}
```

31. What will be the output
```
#include<stdio.h>
int main()
{
        for(char a = 40; a < 300; a++)
        {
            printf("a = %d\n", a);
        }
return 0;
}
```

2.2 1D Pointers and Functions

1. (int const *p = &var) what is this? Explain.
2. Why do we use a function pointer?
3. What is a pointer to a constant? Give an example. how can I change the value in the pointer?
4. What is function declaration and function definition?
5. What is a function pointer? write the syntax?
6. What is null pointer and what is the size of it?
7. .Does context switching happen in inline function?
8. What is the reason for the segmentation fault(give an example)?
9. Take a double pointer and print both address and value.
10. unsigned int x=0x12345678; Extract 78 from x using pointer.
11. Explain call by reference and call by reference with an example.

12. Explain different types of pointers. Explain each with an example.
13. What is the use of a pointer, explain with example.
14. Explain about function declaration and function definition.
15. What is the difference between a pointer to const and a const pointer?
16. Can we store the address of a double variable in an integer pointer?
17. What will be the output of the following code ?
    (Assume the address of num is 1000)

```
int num = 10;
int *ptr = &num;
*++ptr;
print("%d",ptr);
*ptr++;
print("%d",ptr);
```

2.3 String

1. Where to use an array and where to use strings?

2.5 Storage classes and memory segments

1. Explain storage classes.
2. What are the different types of storage classes in C?
3. Explain about memory segments?
4. Explain different storage classes In C ?
5. How extern variable be linked?
6. How to access the static variable outside the file?
7. Global constant and local constant. give an example.
8. const int a=10; static int b=20; a=50; b=60; what will be the o/p?
9. Difference between static memory and dynamic memory
10. Where memory is allocated for a constant variable?
11. Example for global variable and constant variable(write a code)
12. What is the use of code segment?
13. What is the use of code segment? What is stored in code segment?

14. Why I cannot read a register variable?
15.

2.6 2D pointers and DMA

1. Difference between static and dynamic memory allocation?
2. Difference between malloc and calloc ?
3. What is array of pointer?
4. Difference between an array of pointers and a pointer to an array?
5. Application of array of pointer?
6. What is DMA?
7. How Heap memory is used?
8. int (*ptr)(int, int); add(int a, int b);sub(float a,floatb);mul(int a, int b); ?
9. How to use multi-level pointer and what is the advantage of using it.
10. Difference between an array of pointers and a pointer to an array
11. What is a function pointer? Write a program to call a function using a function pointer.
12. Declare a 2d array statically and dynamically.
13. What is a multi-level pointer? Give an example
14. Difference between an array of pointers and a pointer to an array. what happens if I increment it by 1.
15. What is a multi-level pointer?
16. What is need the function pointer.

2.7 Preprocessing

1. Explain Compilation Stages in detail.
2. What is conditional compilation? Explain with an example
3. Command to get the intermediate files in compilation?
4. Create a macro to perform addition operation
5. Explain the compilation stages. Tell the commands used to get the outputs of different stages
6. Explain Macro with an example.

7. What is #define #ifdefine, macro. Give an example of a macro.
8. Write a macro to set a bit.
9. what is conditional compilation?
10. Difference between macro and function?
11. Difference between macro and inline functions?
12. What is inline function? Give an example.

2.8 UDT

1. What is the size of this structure ?
2. What is Structure Padding?
3. create a structure use a pointer and print the value in the pointer. what will be the size of structure? Find the errors before compiling.
4. Difference in memory allocation in structure and union?
5. Initialize a structure, and initialize a variable using a pointer
6. Explain the structure and union difference.
7.
8. How do you Initialise enum? Give an example.
9. What is typedef. create an array of pointers using typedef
10. What is structure? Create an array of structures.
11. What is enum and typedef?
12. Create a structure using typedef.
13. What's the use of typedef?
14. Why do we use the enum keyboard?
15. Give an example for typedef and enum
16. Difference between structure and union?
17. Explain about volatile and const
18. Can we use const and volatile together? If Yes, explain with an example
19. List different User-defined data types and explain each of them.
20. Create a structure other than student (elements of different data types) access the elements using pointers

and print them. before running find the errors. If there is an error, what is the reason? how to correct them .

```
struct structure
{
        int a;
       Char b;
       Char arr[4];
} ;
```

21. Structure bitfields . Can we do any optimization using but fields . And advantages
22. disadvantage of using union
23. Initialise a structure, initialise a variable using pointer
24. How to pass the structure address to the function and print the data in the function.

2. Programming

1. Triangle Pattern program?
2. What is macro and Define a macro to reset the bit in a given position?
3. What's the output of this code?

```
int main()
{
    for(char a = 10; a < 300; a++)
    {
        printf("a = %d\n", a);
    }

        return 0;
}
```

4. WAP to find largest among three numbers.
5. WAP to use void pointer to print the value of num?
6. Define a Macro to find the largest number between three numbers.
7. What will be the output of the program? If there is any error, what is the error and what is the reason?

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

```
int main()
{
   int i=32, j=0x20, k, l, m;
   k=i|j;
   l=i&j;
   m=k^l;
   printf("%d, %d, %d, %d, %d\n", i, j, k, l, m);
   return 0;
}
```

8. Where the memory is allocated for the string. can we change the string
9.
```
#include<stdio.h>
int main()
{
   char *str;
   str = "%s";
   printf(str, "K\n");
   return 0;
}
```
10. WAP to replace the repeated numbers in an array with 0
11. WAP to check system is Big-endian or Little Endian.
12. WAP to allocate memory of 8 bites and store some data in it
13. WAP to remove duplicates from an array.
14. Write a program to obtain the greatest among 3 numbers.
15. Write a program to check if the nth bit of a number is set or not.
16. Write a program to swap two integers, with bitwise operator
17. Write a program to reverse the string [June - 2023]
18. Write a code to fetch each word from the file and compare it with the input word.
19. WAP to implement strcmp function.
20. WAP to Clear nth bit, Set nth bit

21. WAP to check whether the number is a prime number or not.
22. WAP to find the largest of array, even or odd.
23. WAP to swap nibble.
24. One char pointer one 2d array and find out size of pointer and size of total array and size of row and one row stored "mike" and asking length of that row

MC Module

1. Interrupts

1. What is an interrupt? List the different types and explain with an example.
2. How does a timer work?
3. Explain the ISR function in detail.
4. difference b/w microcontroller and microprocessor.
5. using timer interrupt blink the led for delay of 50% in total time 100ms.
6. Explain the EEPROM in detail

2. Projects

1. Explain the Car black box project

3. ADC

1. What is ADC how does it convert analog to digital? how to write a code to do it
2. How do you configure ADC?
3. Explain the significance of different ADC's.
4. How many bit adc you used and how to convert analog to digital.

4. Embedded Systems

1. Difference b/w microcontroller and microprocessor
2. Can I configure micro-processor
3. Which controller did you use?

4. What are the peripherals have you worked on?

5. Protocols

1. Explain the UART Protocol in detail.
2. Explain the I2C and SPI protocol in details.
3. Standard frame format of CAN
4. Types of errors in CAN
5. What is the bit width in uart
6. How do you calculate the speed of the rotating disc using micro controller
7. How actual transmission occurs in uart.
8. Explain I2C Protocol in detail
9. Explain SPI Protocol in detail
10. List the different types of Protocols
11. Explain the configuration of CAN.
12. Explain the LAN protocol in details.
13. Which are the receiver side error and transmitter side error in CAN?
14. Explain the configuration of I2C
15. List out the different types of protocols
16. Want to transmit data of 10 bytes for a distance of 2 to 3 meters. Which protocol can be used?
17. What is frame? Explain it.
18. How the data is transferred in CAN?
19. In I2C how the data is transferred?. Is I2C full duplex or half duplex? Is it a multi-master-slave?

6. PWM

1. What is duty-cycle?

CPP Module

1. Explain the encapsulation in C++ in detail.
2. Difference between the class and structure.
3. Explain the OOPs concept.
4. Explain the inheritance and its types.
5. Explain the function overloading and overriding.

6. Explain the operator overriding.
7. Explain the vertical functions.
8. Explain the Abtractions.
9. Explain the OOPS in class and object .
10. Definitions of Polymorphism.
11. Qualifiers and modifiers

Ds Module

1. Basics

1. What is use of data structure.

2. Linked lists

1. Explain the double-linked list insertion and traversal.
2. WAPto check the circular linked list or not.
3. Explain the linked list and its

3. Stack

1. Explain the stack in detail.
2. Explain the stack application in detail.
3. Explain the difference between the infix, postfix, and prefix

4. Searching and Sorting Technique

1. Explain the search algorithms.
2. Explain the linear search.
3. Explain the binary search.
4. Explain the sorting technique in the array

5. Queue

1. Explain the Nqueue and Dqueue in detail.

6. Trees

1. Write a program to find the leftmost element of each level of a BST

7. Hashing

1. Explain the hash table creation in detail.
2. What is a Binary search tree? Give real-time examples

LI Module

1. Basics

1. Explain the booting sequence.
2. Basic Linux commands How the scheduling will work.
3. Explain the round-robin scheduling.
4. What is virtual memory?
5. How to make the Slow computer to become faster

2. System call

1. Mention all system calls that you know.
2. Explain the fork system call in detail.
3. Explain the use of time system call.
4. Explain the difference between the system call and function.
5. a file contains the following text :
   Name: linux123 Status:
   Active Name: ubuntu
   Status: not active
   Name: 33linux55
   Status: not active
   ...
   ...
   ...
   Write a program to read the file and only display the names and status of the users whose name contains the word 'Linux'.

3. Process

1. Explain the fork and its use.
2. What is the use of the exec system call? And its variants.
3. WAP to make your system hang.
4. Explain the process in detail.
5. Explain the zombie process in detail.
6. How will you print a PID of a process with only knowing only it's process name.

4. IPC

1. What is the use of pipe?

2. How to communicate using a pipe.
3. List all IPC mechanisms.
4. Use of SHM in detail.

5. Signal

1. Explain the signals in detail.
2. What is a SIGINT signal?

6. Socket

1. What is the use of socket programming?
2. Explain the use of TCP programming.
3. Explain the use of UDP programming.
4. Difference between the TCP and UDP socket

7. Threads

1. Explain the use of mutex and semaphores.
2. Explain the difference between the process and thread.
3. Explain the binary semaphore in detail.
4. Explain the semaphores in detail.
5. What is the use of mutex?
6. What is meant by deadlock

8. Process and Memory Management

1. Some questions related to Memory & Process Scheduling Types

General Questions

1. Explain about router
2. Explain projects
3. What are the difficulties you faced while doing projects and how you overcomed it
4. Which topology connect to common network.
5. SI unit for power.
6. Different between Switch and hub
7. .If speed = 60 km/h, find the distance covered in 2 hours 30 minute.

8. The mean of 5 numbers is 20 If one number is excluded, mean of the remaining numbers becomes 18 then the excluded number is _____.
9. If a man can complete a work in 10 days, what fraction of work will he complete in 2 day
10. in 1000 lines of code with so many different errors and also segmentation fault is occured,then how you will debug the code segmentation fault