Adv C Module

1. Subjective

2.1 Basic Refreshers

1. Explain the datatypes.
2. Explain all the bitwise operators with an example.
3. Explain what is meant by arrays and how to access array elements.
4. Explain How to take 2's complement on negative numbers.
5. Explain the types of loops in detail.
6. Explain the difference between i = i + 1 and i++.
7. What is gcc?
8. Explain the Break and continue.
9. What is meant by overflow?

2.2 1D Pointers and Functions

1. Explain pointers and use of those.
2. Explain what is meant by referencing and de-referencing.
3. Explain recursion with an example.
4. What is stack overflow? When the stack overflow will happen?
5. If u have an address let's say 0x23456466777 => how will you say to CPU to store data in it.
6. What is the difference b/n 32 and 64 bit system , what are the pointer sizes in it
7. Explain the difference between pass-by-value and pass-by-reference.
8.

2.3 String

1. Explain the difference between modifiable and constant string.

2.5 Storage classes and memory segments

1. Explain memory segments in detail.
2. Explain the register keyword and static keyword in detail.

3. Explain the extern keyword with an example program.
4. Explain storage classes in detail.
5. Explain static keywords in detail.
6. Explain the use of static functions.
7. What is the difference between global scope and file scope.

2.6 2D pointers and DMA

1. What are the pointers available in C programming?
2. Explain the function pointer with an example program.
3. What is the size of int, int *, int **
4. In 5000 lines of code, what will happen if we forget to free the memory that we allocated dynamically?
5. Explain all the ways to create a 2D array.
6. Explain Dynamic memory allocation.
7. Explain Null pointer and dangling pointer.
8. Explain memory leak in detail with example.

2.7 Preprocessing

1. Explain the stages of compilation.
2. Explain the difference between inline function an d macro

2.8 UDT

1. Calculate the size of given structures.
2. Explain structure bit-fileds
3. Explain the difference between structure and union.
4. Explain structure padding and how to overcome that?
5. Explain typedef in detail.

2.9 Miscellaneous

1. What is volatile and why is it used in embedded programming?
2. What is the alternative to the Volatile keyword in Embedded C programming.

2.10 FILE I/O

1. Explain file handling.

2. How do you read data from an MP3 file?
3.

2. Programming

1. WAP to print the spiral form of matrix
2. Reverse the words in the array.
   i/p : "I LOVE INDIA" o/p : "INDIA LOVE I"
3. WAP to convert positive decimal numbers into binary, octal, hexadecimal.
4. WAP to calculate sum of n numbers using recursion.
5. Write a recursive function to solve the Tower of Hanoi problem for **N** disks, moving them from Source (A) to Destination (C) using Auxiliary (B) while following the given constraints.
6. WAP to multiply and divide two numbers using bitwise operators.
7. Write a program to check if the number is prime or not.
8. WAP to swap the nibbles without using 2nd variable.
9. WAP to find the average of a given array.
10. WAP to check the number is ODD or EVEN by using bitwise operator.
11. WAP to get n bits from the position.
12. WAP to find the endianness of the system.
13. WAP using a structure with bit-fields to store 5 parameters within a 2-byte
14. WAp to add two string and print the result.
15. WAP to fine the factorial of a number using recursion.
16. WAP to swap two variables without using an extra variable.
17. WAP to replace all 0s with 1s in a number.
18. WAP to find the endianness of a system.
19. WAP to sort an array using pointers.
20. WAP to declare and access a function through a function pointer.
21. WAP to find the size of an int datatype.
22. WAP to reverse a string without using library function.

23. WAP to find the palindromic prime number.
24. WAp to divide the odd and even elements in a sorted manner without using the extra array.
25. WAP to print the frequencies of digits in a string
    Eg :
    input -> djbs5383dhh12
    O/p --> 0 1 1 2 0 1 0 0 1 0.

26. Read the string from the user and print the string in which reverse the vowels in that
    Eg :
    I/p : IceCreAm
    O/p : AceCreIm
27. print the maximum difference between two successive elements of a sorted array
    Eg:
    I/p: size - 5
    20 47 32 21 15
    O/p : 15
28. WAP a program to read roll no, name and marks of n number of students and print only the details of above avg students
29. WAP to rotate the matrix 90 degree anti clockwise.
30. WAP to swap MSB and LSB bit.

MC Module

1. Basic electronics

1. Explain MOSFET & FET
2. Explain logic gates.
3. Explain the concept of thyristor.
4. Explain the concept of ammeter and galvanometer.

5. Explain Ohm's law
6. Explain Op-amp.
7. Explain Multiplexers
8. Explain the difference between analog and digital electronics.
9. Explain flipflops, latches, rectifiers, diodes
10. Why BJT is called current controlled device?
11. Explain Zener-diode.
12. What is capacitor, resistor, transistor, voltage regulator?

2. Basics

1. Explain the difference between a microcontroller and a microprocessor.
2. What is the use of watch dog timer.
3. What is the difference between ARM and 8051 microcontrollers?
4. Explain the difference between Pull-up and Pull-Down circuit.
5. Explain the difference between sourcing and sinking circuit.
6. Explain the architecture of your microcontroller.
7. Explain Contact switching
8. Explain Synchronous vs Asynchronous Functions
9. Explain the difference between hardward and Von-nuwmon architecture.
10. what is mean by bidirectional(ports)
11. what is the difference between ROM and RAM

3. Interrupts

1. What is meant by program counter?
2. Calculate overflow for 1HZ frequency in a 16-bit register.
3. Explain ISR & IVT
4. Explain types of ISR

4. Projects

1. Explain what and all protocols used in your project.
2. Draw the Block diagram of car black box.

5. ADC

1. Given a 12-bit ADC with a reference voltage (Vref) of 5V and an input voltage (Vin) of 2.5V, calculate the digital count.
2. Explain how the ADC is converting analog value into digital value.
3. What is meant by the resolution of a register?
4. How to calculate the step-size

6. Embedded Systems

1. What is meant by ES? What are the different components of ES?

7. Protocols

1. Explain CAN protocol.
2. Write the code for transmitting and receiving data throught the I2C protocol.
3. In your microcontroller UART protocol using RTC or CTR?
4. What is the speed of UART, I2C, SPI, and CAN.
5. Why are you using pull-up circuit in I2C protocol?
6. Explain how to read and write the data from the EEPROM to MC using I2C protocol?
7. Explain I2C protocol
8. Explain UART protocol.
9. Explain CAN arbitration.
10. Explain CAN error frames in detail.
11. Explain CTS and RTS in UART protocol.

8. PWM

1. Explain what is meant by PWM.
2. Explain the duty cycle.

9. programming

1. Write a small code to declare and use a variable between a program and ISR.

CPP Module

1. What is abstraction, polymorphism, and inheritance in C++
2. How inheritance and polymorphism are related in C++
3. what is a virtual function table? What's there in it?
4. WAP in C++ to insert and delete a node.

Ds Module

1. Basics

1. Explain what is the use of makefile.
2. Difference between user space and kernel space

2. Linked lists

1. What is meant by linked-list and where it is used?

3. Stack

1. Explain the Stack Data structure with an example program.

4. Searching and Sorting Technique

1. Explain the sorting techniques you know.

5. Queue

1. Explain the Queue data structure with an example program.

6. Trees

1. Explain tree data structure.

LI Module

1. Basics

1. What is OS?

2. System call

1. What is system calls, explain how system calls work.

3. Networking

1. Explain the difference between TCP Vs UDP with an example.
2. Explain the difference between semaphore and mutex.

4. Process

1. What is a process in Linux?
2. How is a process different from a thread?
3. What are the different process states in Linux?
4. Explain the fork() system call and its purpose.
5. How does a parent process retrieve the exit status of a child process?

5. IPC

1. What is Inter-Process Communication (IPC)?
2. Compare Sockets with other IPC mechanisms like Pipes, Shared Memory, and Message Queues.
3. Why are sockets used for IPC, even on the same machine?

6. Signal

1. What is a signal in Linux?
2. How are signals used for IPC (Inter-Process Communication)?
3. What is the difference between synchronous and asynchronous signals?

7. Socket

1. What is a socket in networking?
2. Differentiate between TCP sockets and UDP sockets.
3. What are the key functions used in socket programming?

8. Threads

1. Explain the difference between threads and process

9. Process and Memory Management

1. What is a process in Linux?
2. What are the different process states in Linux?
3. Explain the role of Process Control Block (PCB).
4. What is the difference between fork() and exec()?
5. What is a zombie process, and how can it be avoided?

General Questions

1. Explain academic projects in depth
2. Name the projects done in emertxe.
3. Self-introduction
4. Are you ready to re-locate?
5. Find the angle between hour and mins of clock 3:15 pm.
6. Find the current and voltage in given circuit.
7. What is the difference between shell scripting language and C language?
8. How does a TV remote control work?
9. What types of motors are used in ceiling fans?
10. Explain the circuit of how two switches can control a single light.
11. What is a rectifier, and how does it work?
12. How does a voltage divider work?
13. How does fan regulator works
14. I am giving a scenario when you enter a room when the door opens the light should turn on and when the door closes the light should turn off design a circuit for this if possible write the code and explain too.
15. Some many circuits given and asked to solve the problems using kvl kcl
16. Explain how to turn on and turn off LED by using PIR sensor
17. What all the data types in python
18. Difference between list and tuples.
19. How to find .txt files in home directory using linux
20. The booting sequence in Linux.
21. How do you list files in Linux.
22. The syntax for echo command in Linux

23. Asked me to explain one of the projects in detail which we put maximum effort
24. Command to find all c files in current working directory and other directory.
25. Write the simple steps from your perspective
    a. What is an embedded system list down the important blocks.
    b. Where the software resides and how it boots.
26. What is a cpu in a SoC and what is its significance.
    a. What is an ISA, and list down the most common ISA
    b. What is Cache what are the pros and cons.
    c. What is meant by memory management and memory protection.
27. asked to write function definitions in c like syntax and in Python and as a string give an output of integer in Python, how do you rate yourself in Python and c, asked academic project, asked Linux project in the institute, what ide used for an academic project, do you know shell scripting, asked git commands, difference between git and GitHub and with how many tools you know so far, asked arm architecture,how do you compile and run with that architecture,what are all the commands with respect to gcc,in windows how do you installed gcc,what is linux distribution ,a part from ubuntu what versions do you know,what is version control and asked git commands

Python

1. Python program to divide two numbers.
2. Difference between mutable and immutable datatypes.
3. Write a Python program to check palindrome.
4. Write a Python program to find factorial with recursion.
5. Write a Python program to merge two sorted lists.
6. Write a Python program to count words in a sentence.
7. Explain list, dictionary, and tuple comprehension with an example.