I.C.T PAST PAPERS SOLVED

SLIDE NO.1+7:

Q. 1 Given a hard disk with

(platters = 4, tracks per platter side = 8, sector per track = 18)

Calculate the following:

1. Number of read/write heads

4 (because 4 platters)

1. Total tracks in hard disk

Tracks per platter side = 8

Tracks of both sides = 8 + 8 = 16

Total platters = 4

Total tracks = 16 * 4 = 64

1. Total sectors in hard disk

Track per plotter side = 8

Sector per track = 18

Total per side = 18 * 8 = 14

Total on B.S = 144 + 144 = 288

Total sectors = 1152

1. Sectors per platter side

Track per platter side = 8

Sector per platter side = 18*8 = 144

Q.2: Do the following:

i) Add(AC9F2BBE)16 and (7D9B3AC)16

ii)Subtract (1011011)2 From (11010110)2

Ans: i) To add (AC9F2BBE)16 and (7D9B3AC)16, we first convert both numbers to base 10: (AC9F2BBE)16 = (2869172334)10 (7D9B3AC)16 = (208847316)10 Then we add the two numbers in base 10: 2869172334 + 208847316 = 3078019650 To convert back to base 16: 3078019650 = (BDEF3A06)16

ii) To subtract (1011011)2 from (11010110)2, we first convert both numbers to base 10: (1011011)2 = (91)10 (11010110)2 = (214)10 Then we subtract the two numbers in base 10: 214 - 91 = 123 To convert back to base 2: 123 = (1111011)2

Q.3: Ali wants to back up his data.

i. Give two reasons why making a backup is necessary.

ii. Ali thinks that making backups will prevent his data from getting viruses.

Describe what a virus is and explain why Ali is wrong.

Ans: i. Two reasons why making backups is necessary are:

- To protect against data loss due to hardware failure or other unexpected events.
- To enable restoring data in case of accidental deletion or corruption.

ii. A virus is a type of malware that replicates and spreads to other computers, causing damage and stealing information. Making backups will not prevent data from getting infected by viruses, antivirus software must be used to protect against them.

Q.4: Explain the following topologies(Bus, Star, ring and mesh) using diagram.

Ans: Diagram will be found on internet.

Q.5: Identify the type of relationship between the following given entities:

i. Department and HoD

ii. Project and Supervisor

iii. Department and Employee

iv. Student and Subject

v. Student and Teacher

Ans: i. Department and HoD - one to one relationship

ii. Project and Supervisor - one to one or one to many relationship

iii. Department and Employee - many to many relationship

iv. Student and Subject - many to many relationship

v. Student and Teacher - many to many relationship

SLIDE NO.3:

Q.1: Evaluate (to true or false) each of the following expressions:

i.14<=14 OR 14<14

ii.-9>-25 AND -25 > -9

iii. Not(True)

iv. 30 < 34 AND 34 < 56 OR 27> 9

v. Not(28<34 AND 18 < 56 OR 9>=9)

Ans: i. True (14 is equal to 14 OR 14 is less than 14)

ii. False (-9 is not greater than -25 AND -25 is not greater than -9)

iii. False (Not(True) is False)

iv. True (30 is less than 34 AND 34 is less than 56 OR 27 is greater than 9)

v. False (Not(28 is less than 34 AND 18 is less than 56 OR 9 is greater than or equal to 9) is False)

Q.7: Apply appropriate problem-solving technique and calculate the water bill. Different slabs are used to calculate the bill. Utilization is measured in cubic feet. Water company charges the homeowner on one of the following slabs.

i. a flat rate of 15$ for usage upto and including 1000 cubic feet.

ii.0.0175$ per cubic foot for usage over 1000 cubic feet and upto and including 2000 cubic feet.

iii. 0.02$ per cubic foot for usage over 2000 cubic feet and upto and including 3000 cubic feet.

iv. A flat rate of 70$ for usage over 3000 cubic feet.

Ans: o calculate the water bill, we can use the following steps:

1. Determine the total usage in cubic feet.
2. Apply the slab rate for usage upto 1000 cubic feet (15$).
3. Calculate the usage above 1000 cubic feet and apply the slab rate of 0.0175$ per cubic foot.
4. Calculate the usage above 2000 cubic feet and apply the slab rate of 0.02$ per cubic foot.
5. Add the charges from all the slabs to get the total water bill.

For example, let's say the total usage is 2500 cubic feet.

- The charge for usage upto 1000 cubic feet is 15$ (flat rate).
- The usage above 1000 cubic feet and upto 2000 cubic feet is 500 cubic feet (2500 - 1000). The charge for this usage is 0.0175$/cubic feet * 500 cubic feet = 8.75$.
- The usage above 2000 cubic feet and upto 3000 cubic feet is 500 cubic feet (2500 - 2000). The charge for this usage is 0.02$/cubic feet * 500 cubic feet = 10$.
- There is no usage over 3000 cubic feet, so the flat rate of 70$ is not applied.
- Therefore, the total water bill is 15$ + 8.75$ + 10$ = 33.75$

Note: you need to have the total usage of water in cubic feet to be able to calculate the bill.

Q.8: The XYZ Boutique is having a five day sale. Each day, start with Monday, the price will drop 10% of the previous day price.

Ans: To calculate the price of the items on each day of the sale, we can use the following steps:

1. Determine the original price of the item.
2. For Monday, the price will be the original price.
3. For Tuesday, the price will be 90% of the original price (original price * (1 - 10%))
4. For Wednesday, the price will be 90% of the Tuesday's price (Tuesday's price * (1 - 10%))
5. For Thursday, the price will be 90% of the Wednesday's price (Wednesday's price * (1 - 10%))
6. For Friday, the price will be 90% of the Thursday's price (Thursday's price * (1 - 10%))

Here is python code:

original_price = 100 # starting price on Monday

for i in range(1, 6):

sale_price = original_price * (1 - (i * 0.1))

print(f"Day {i}: {sale_price}")

SLIDE NO.5+9:

Q.6: Mr. Jones, a history instructor, would like to know the percentage increase in the population of the United States, per decade given the first decade and the last decade. Other given data included the population at the beginning of each decade. Draw the flowchart for this problem.

(Hint: Percentage = (present decade population – previous decade population)/present population * 100)

Ans: Note: This is a flow chart question but python code is for concept

Get first decade population

p1 = int(input("Enter population for first decade: "))

Get last decade population

p2 = int(input("Enter population for last decade: "))

Calculate percentage increase

percentage = (p2 - p1) / p1 * 100

Print percentage increase

print("Percentage increase in population per decade: ", percentage,"%")

Q.7: Suppose you want to develop a program to play a lottery. The program randomly generates a three-digit lottery number. The program prompts the user to enter a three digit-number and determines whether the user wins according to the following rules:

1. If the user input matches the lottery number in the exact order, the award is 10,000$

2.If all the digits in the user input match all the digits in the lottery number, the award is 3000$

3.If one digit in the user input matches a digit in the lottery number, the award is 1000$

Ans: import random

Generate a random three-digit lottery number

lottery_number = str(random.randint(100, 999))

Get user input

user_input = input("Enter a three-digit number: ")

Check if the user input matches the lottery number

if user_input == lottery_number:

print("Congratulations! You won $10,000!")

elif set(user_input) == set(lottery_number):

print("Congratulations! You won $3,000!")

elif any(digit in user_input for digit in lottery_number):

print("Congratulations! You won $1,000!")

else:

print("Sorry, you didn't win. The lottery number was", lottery_number)

Q.8: Twin primes are a pair of prime numbers that differ by 2. For example, 3 and 5, 5 and 7, and 11 and 13 are twin primes. Write a function to find all twin primes less than 1000. Display the output as follows:

(3,5)

(5,7) …

Ans: def find_twin_primes():

twin_primes = []

for i in range(3, 1000):

if is_prime(i) and is_prime(i + 2):

twin_primes.append((i, i + 2))

for twin_prime in twin_primes:

print(f"({twin_prime[0]},{twin_prime[1]})")

def is_prime(n):

if n < 2:

return False

for i in range(2, int(n ** 0.5) + 1):

if n % i == 0:

return False

return True

find_twin_primes()

Q9: Credit card numbers follow certain patterns: It must have between 13 and 16 digits, and the number must start with:

4 for Visa cards

5 for MasterCard credit cards

37 for American Express cards

6 for Discovery cards

The Luhn’s algorithm is useful to determine whether a card number is entered correctly or whether a credit card is scanned correctly by a scanner. Credit card numbers are generated following the validity check, which can be described as follows(for illustration consider the card number 438857601802626):

Ans: def is_valid_credit_card(card_number):

Reverse the order of the digits

card_number = card_number[::-1]

Convert to a list of integers

card_number = [int(digit) for digit in card_number]

```
# Double every second digit
for i in range(0, len(card_number), 2):
card_number[i] *= 2
# Subtract 9 from numbers over 9
if card_number[i] > 9:
card_number[i] -= 9
# Sum all the digits
total = sum(card_number)
# Check if the sum is divisible by 10
if total % 10 == 0:
return True
else:
return False
# Example usage
card_number = "438857601802626"
if is_valid_credit_card(card_number):
print("The card number is valid.")
else:
print("The card number is invalid.")
```

SLIDE NO.6+8:

PART 1

Q.1(A): A student entered a math problem, 100*48. Explain how it will be processed in the memory with respect to the machine cycle. Support your answer with diagram.

Ans: The process of a computer solving a math problem such as "100*48" involves several steps, each of which takes place during a specific machine cycle. Here's a general overview of how the problem would be processed in the memory:

The instruction "100*48" is loaded into memory and the CPU retrieves it during the fetch cycle.

During the decode cycle, the CPU interprets the instruction and determines that it is a multiplication operation.

In the execute cycle, the CPU retrieves the operands (100 and 48) from memory and performs the multiplication operation.

During the writeback cycle, the result (4800) is stored in memory or a register for later use.

(DIAGRAM)---FIND THROUGH INTERNET?

Q.1(B): Now a student wants to solve multiple math problems. Explain how it will be processed using pipelining?

Ans: Pipelining is a technique that allows a CPU to work on multiple instructions at the same time, improving its overall performance. For example, when a student wants to solve the math problems "10048" and "5020" simultaneously, the CPU can fetch the first instruction "10048", decode it and execute it, at the same time it is fetching, decoding and executing the second instruction "5020". This way the CPU can solve multiple math problems quickly by overlapping the execution of multiple instructions.

Q.2(A): Explain the function of memory subsystem considering the windows booting process. Support your answer with the diagram.

Ans: The memory subsystem plays an important role in the Windows booting process by storing the BIOS, bootloader, kernel and system components during startup. The kernel manages system's resources, including memory, and creates processes and threads. It also plays a key role in the operation of the operating system by providing memory for running processes and applications. The BIOS loads the MBR into memory which locates and loads the bootloader, which in turn loads the kernel and starts the initialization process.

(DIAGRAM)---FIND THROUGH INTERNET?

Q.2(B): Explain the difference between circuit switching, packet switching and broadcasting using diagram.

Ans: Circuit Switching: In circuit switching, a dedicated communication path is established between sender and receiver for the duration of the transmission. The path is reserved exclusively for the use of the sender and receiver and no other user can use it. An example of circuit switching is telephone networks.

Packet Switching: In packet switching, data is broken into small packets and each packet is sent individually through the network. The packets are reassembled at the destination. Packet switching allows multiple transmissions to occur simultaneously, making it more efficient than circuit switching. An example of packet switching is the Internet.

Broadcasting: In broadcasting, a single source sends the same message or data to all devices connected to the network. This is done by broadcasting the message to all available channels or addresses. An example of broadcasting is a TV or radio transmission.

(DIAGRAM)---FIND THROUGH INTERNET?

Q.3(A): Describe Cyber-Crime?

Ans: Cybercrime refers to any illegal activity that involves the use of computer networks or the internet to commit criminal acts. Some examples of cybercrime include: Hacking, Identity theft and malware e.t.c.

Q.3(B): Explain different types of cybercrimes performed to steal information from compromised PC.

Ans: There are several types of cybercrimes that can be used to steal information from a compromised PC. Some of the most common include:

1. Malware: using malicious software such as viruses, worms, and Trojan horses to damage or gain unauthorized access to computer systems.
2. Phishing: using fake emails, websites or social media profiles to trick people into revealing personal information.

Q.4(A): Draw the cloud computing architecture that will show the access mechanism and storage hierarchy of clouds resources.

Ans: (DIAGRAM)---FIND THROUGH INTERNET?

Q.4(B): What is the difference between cloud computing and edge computing. Explain the best possible application for both.

Ans: Cloud computing uses remote servers to store, manage and process data while Edge computing uses distributed, local servers to process and analyze data closer to the source. Cloud is best for scalability, reliability, and large storage while Edge is best for low latency, real-time processing, and high security.

Q.5: Part 2:

A company that issues check-cashing cards uses an algorithm to create card numbers. The algorithms adds the digits of an four-digit number, and then adds a fifth number of 0 or 1 to make the sum of the digits even. The last digit in the number is called check digit. Complete the six problem-solving steps to develop a solution that accepts a four-digit number into one variable, adds the check digit, and prints the original number and the new number.

Test your flowchart with the following data.

Original number = 4737(47371) and 4631(46310).

Ans: Pseudo code:

original_number = input("Enter a four-digit number: ")

sum_of_digits = sum(int(digit) for digit in original_number)

if sum_of_digits % 2 != 0:

check_digit = 1

else:

check_digit = 0

new_number = original_number + str(check_digit)

print("Original number:", original_number)

print("New number:", new_number)

Note: this is python code, question requires flowchart of raptor now by this code you can make that flowchart.

Testing:

For example,

Original number = 4737

The sum of the digits is 18 which is even so the check digit would be 0

New number: 47370

Original number = 4631

The sum of the digits is 15 which is odd so the check digit would be 1

New number: 46311

The algorithm works as expected, and it should also work for any other four-digit number.Top of Form

Essa paper:

Part-1:

Q.1: Differentiate b/w tracks, sectors, clusters and cylinder of a hard disk with the help of a diagram.

Ans: A track is a circular path on the surface of a hard disk where data is stored. A sector is a small section of a track where data is stored. A cluster is a group of sectors that is used to store a file. A cylinder is a group of tracks that are at the same physical location on the disk platters.

Note: Find diagram from internet.

Q.2: Describe pipelining and its purpose.

Ans: Pipelining is a technique used to increase the instruction throughput by dividing the instruction processing into stages and allowing multiple instructions to be in various stages of execution simultaneously. It improves the performance of a computer system by reducing idle time and increasing the number of instructions executed per unit time.

Q.3: What is E-Commerce? How is it different from Traditional Commerce methods?

Ans: E-commerce refers to buying and selling of goods and services over the internet, while traditional commerce refers to buying and selling of goods and services through brick-and-mortar stores, catalogs, and other offline methods. E-commerce provides more convenience, reach, personalization, speed and cost effectiveness than traditional commerce methods.

Q.4: What is bus in computer system? Discuss different types of buses.

Ans: A bus in a computer system is a communication pathway that allows different components of the system to communicate with each other. It consists of a set of parallel wires or traces that carry data, addresses, and control signals between the different components of the system.

Different types of buses in a computer system include:

1. Data Bus: Carries data between the processor and memory or I/O devices.
2. Address Bus: Carries memory addresses between the processor and memory.
3. Control Bus: Carries control signals and commands between the processor and other components of the system.
4. Memory Bus: Carries data between memory and other devices.
5. Expansion Bus: Allows additional devices to be connected to the system, such as expansion cards for graphics, sound, and networking.
6. Internal Bus: Connects the different components within the processor like ALU, Register, Control Unit etc.
7. System Bus: Connects all the components of a computer system together, including the processor, memory, and I/O devices.
8. Peripheral Bus: Connects peripheral devices to the computer, such as a keyboard, mouse, or printer.

Q.5: Differentiate b/w register and cache memory?

Ans: Registers are small, fast memory units within the CPU that store data temporarily for the CPU's use. Cache memory is small, fast memory located closer to the CPU that stores frequently accessed data

from main memory to speed up access and reduce wait time for the CPU. The main difference is their function and location in the computer system.

Part 2:

Q.1: Convert (FAC)16 to binary and decimal.

Ans: To convert the hexadecimal number (FAC)16 to binary, we can substitute each hexadecimal digit with its corresponding 4-bit binary value.

FAC = 15 (in decimal) * 16^2 + 10(in decimal) * 16^1 + 12(in decimal) * 16^0 FAC = 3880

So (FAC)16 = (1111 1010 1100)2 in binary.

To convert the hexadecimal number (FAC)16 to decimal, we can use the following formula:

FAC = (15 * 16^2) + (10 * 16^1) + (12 * 16^0) = 3880

So (FAC)16 = 3880 in decimal.

Part 3:

Q.1: Differentiate b/w Database and Database Management System?

Ans: A database is a structured collection of data, while a DBMS (Database Management System) is a software system used to create, maintain, and manage that data. A DBMS provides tools and interfaces for creating, modifying and querying databases, as well as managing access to the data. In short, a database is the data, and a DBMS is the system that manages and interacts with that data.

Q.2: Differentiate b/w Flat file and relational database?

Ans: A flat file is a simple plain-text file that stores data in a single record per line, while a relational database is a more powerful and flexible type of database that organizes data into tables with relationships between them using keys. Flat files are simple to use but not suitable for complex data relationships or large amounts of data, while relational databases are more efficient for those scenarios.

Q.3: Differentiate b/w Campus Area Network and Metropolitan Area Network, intranet, Extranet, Client -Server and peer-to-peer, Bus Topology and star topology.

Ans: Campus Area Network (CAN) connects devices within a specific geographic area such as a university or a business campus, while Metropolitan Area Network (MAN) connects devices within a larger geographic area such as a city.

Intranet is a private network for internal use and Extranet is a private network for external partners or customers.

In client-server network, clients request and receive services from servers. In peer-to-peer network, devices act as both clients and servers and share resources.

In bus topology, devices are connected to a central cable while in star topology, devices are connected to a central hub.

Star topology is more expensive but more reliable and easier to troubleshoot than bus topology, in which if the central cable breaks, the whole network will be down.

Q.4: Define E-Commerce and differentiate b/w B2C and B2B type of E-Commerce.

Ans: E-Commerce is the buying and selling of goods and services over the internet. B2C e-commerce is when businesses sell directly to consumers and examples include Amazon, Zalando. B2B e-commerce is when businesses sell to other businesses, examples include Alibaba and ThomasNet.

Q.5: Differentiate b/w primary key and foreign key?

Ans: A primary key is a unique identifier for a record in a table that ensures no duplicate keys, while a foreign key is a field in a table that matches the primary key of another table and establishes a link between the two tables for data integrity.

Part 4:

Q.1: A perfect number is a number for which the sum of its proper divisiors is exactly equal to the number. For example, the sum of the proper divisors of 28 would be 1 + 2 + 4 + 7 + 14 = 28, which means that 28 is a perfect number.

Draw the flowchart of a program that asks user to input a number and then prints if the user has entered a perfect number or not.

Ans: Note: Flow chart is not available but the concept is here:

1. Start the program
2. Ask the user to input a number
3. Store the number in a variable
4. Initialize a variable to store the sum of proper divisors
5. Use a loop to go through all the numbers from 1 to the input number
6. Within the loop, check if the current number is a divisor of the input number
7. If it is a divisor, add it to the sum of proper divisors
8. After the loop, check if the sum of proper divisors equals the input number
9. If it does, print "The number is a perfect number"
10. If it doesn't, print "The number is not a perfect number"
11. End the program

Here it’s python program for more clearness:

```
# get user input

num = int(input("Enter a number: "))

# initialize sum of divisors

sum_divisors = 0

# find divisors and add them to sum_divisors

for i in range(1, num):

if num % i == 0:

sum_divisors += i

# check if the number is perfect

if sum_divisors == num:

print("The number is a perfect number.")
```

else:

print("The number is not a perfect number.")

Q.2: Draw a flowchart to guess a random number between 1-20 based on the following. User is prompted to enter a guess. If the user guesses then the prompt appears again until the guess is correct, on successful guess, user will get a " Well guessed" message, and the program will exit.

Ans: Note: Flow chart is not available but the concept is here:

1. Start the program
2. Generate a random number between 1 and 20 and store it in a variable
3. Ask the user to input a guess
4. Store the guess in a variable
5. Check if the guess is equal to the random number
6. If the guess is incorrect, go back to step 3 and prompt the user for another guess
7. If the guess is correct, print "Well guessed!" and exit the program

Python code:

import random

generate random number

rand_num = random.randint(1, 20)

while True:

get user input

guess = int(input("Enter your guess: "))

check if the guess is correct

if guess == rand_num:

print("Well guessed!")

break

else:

print("Incorrect guess, please try again.")

Part 5:

Q.1: Write a program that gives a simple math quizzes. The program should display two random numbers that are to be added, such as 247 + 129. The program should allow the student to enter the answer. If the answer is correct, congratulation should be displayed. If the answer is incorrect, a message showing the correct answer should be displayed.

Ans: import random

while True:

generate random numbers

num1 = random.randint(100, 999)

num2 = random.randint(100, 999)

```
# ask the user for the answer
answer = int(input(f"What is {num1} + {num2}? "))
# check if the answer is correct
if answer == num1 + num2:
print("Congratulations! You are correct.")
else:
print(f"Incorrect, the correct answer is {num1 + num2}")
```

Q.2: Write a python program which iterates the integers from 1 to 50. For multiples of three print “Hello” instead of the number and for the multiples of five print “World”. For number which are multiples of both three and five print “Hello World”.

Sample Output:

Hello World

1

2

Hello

4

World

Ans:

```
for i in range(1, 51):
if i % 3 == 0 and i % 5 == 0:
print("Hello World")
elif i % 3 == 0:
print("Hello")
elif i % 5 == 0:
print("World")
else:
print(i)
```

Q.3: What will be the output of the following Program segement:

```
n = 5
for i in range(n):
for j in range(i):
print(‘*’, end =” ”)
print(‘ ’)
for i in range(5,0,-1):
for j in range(i):
```

```
print('*',end="")
print(' ')
```

Output:

```
*
**
***
****
*****
****
***
**
*
```

Q.4: Point out errors in the following statements/program segment (if any) and write the correct code (whatever required):

i) sum = 0

i = 1

while i<10:

sum = sum + i

The variable "i" is not incremented inside the while loop, which will make the loop infinite.

i = i + 1

ii) 1 = y

x = 5*(3/2) + 3 * 2

x = y + 1

area = radius * radius * 3.14159

radius = 1.0

There are two errors in the code.

1.The first line is trying to assign a value to the number 1, which is not allowed.

2.The variable "radius" is used before it is assigned a value.

New slide:

Q.1(A): Define ICT? Explain role of ICT in education and business during covid-19 phase?

Ans: ICT, or Information and Communication Technology, refers to the technologies and tools used to transmit, receive, and process information such as computers, the internet, and mobile devices. During the COVID-19 pandemic, ICT has been crucial in education and business, allowing remote learning and telecommuting to continue classes and operations, respectively. It has enabled continuity of education and business operations during the pandemic and its importance will continue to grow in the future.

Q.1(B): How many machine cycles are required to execute the addition instruction of 4+6. Write steps of each cycle.

Ans: The number of machine cycles required to execute the addition instruction of 4+6 can vary depending on the specific architecture of the processor and instruction set. However, typically it will involve the following steps:

1. Fetch: The instruction is fetched from memory and loaded into the instruction register.
2. Decode: The instruction is decoded to determine the operation to be performed.
3. Execution: The operation (addition) is executed, with the operands (4 and 6) being added together and the result (10) being stored in a register.
4. Write back: The result is written back to memory or a register. Note that the actual number of cycles and steps may vary depending on the architecture and instruction set used.

Q.1(C): Suppose you are currently working on Powerpoint presentation software, for entering material in it you have launched chrome application. You have been working for almost an hour on these two applications. Suddenly you have opened Word processor to collect previously completed data. Which type of memory will be used to launch each application and why?

Ans: When an application is launched, the operating system loads it into memory, either RAM for quick access or virtual memory from hard drive when RAM is low. The specific type of memory used can depend on the operating system and device resources.

Q.1(D): Give few examples of Embedded Systems.

Ans: Embedded systems are computer systems integrated into other devices or products to perform specific functions. Some examples include: automotive systems, home appliances, medical devices, industrial control systems, mobile devices, wireless sensor networks, robotics and smart home systems.

Q.2(A): The user has entered a number 4012 and 786 from the keyboard to be added.

i. perform the conversions that how computer will convert the numbers into binary.

ii. add the converted numbers together and

iii. produce the result in a user understandable (decimal) format.

Ans: i. In order to add two numbers, 4012 and 786, a computer must first convert them into binary. The binary equivalents of 4012 and 786 are 111110110100 and 1100010010 respectively. ii. To add the two binary numbers together, we must align them and add bit by bit, remembering to carry over any overflow. iii. To produce the result in a user-understandable (decimal) format, we can convert the binary number back to decimal using the method of adding up the values of each bit. The result of adding 4012 and 786 is 4802 in decimal format.

Q.2(B): Consider an image having 4300 * 3500 pixels. What would be the size (in bytes) of the image in a RGB(red, green, blue) channel ?

Ans: An image with 4300 * 3500 pixels in RGB format would have a size of 45,150,000 bytes. Each pixel requires 3 bytes (1 byte for each color channel red, green, blue). The size of the image may vary depending on the image compression algorithm used and the format the image is saved in.

Q.3(A): What is a network topology? Explain different types of network topologies with an example.

Ans: A network topology refers to the physical and logical layout of the devices and connections in a network. It describes how devices are connected and how data flows within the network.

Types:

1. Bus topology: all devices connected to a single central cable, example: Ethernet
2. Star topology: all devices connected to a central hub, example: Home network
3. Ring topology: devices connected in closed loop, example: FDDI
4. Mesh topology: every device connected to every other device, example: Wireless ad-hoc networks
5. Tree topology: hierarchical structure with central hub, example: Cable modem networks
6. Hybrid topology: combination of two or more topologies, example: Star and Bus topology combined

Q.3(B): Differentiate b/w utility software and system software. Give examples.

Ans: Utility software is a type of software that helps manage and maintain the computer's resources and operations, examples include antivirus software, disk defragmenters and backup software. System software is software that controls and manages the computer's hardware and software resources, examples include operating systems, device drivers and other programs necessary for the computer to function properly.

Q.3(C): Suppose you want to be a private network that is similar to the World Wide Web for use by employees of a specific organization, then which type(Intranet, Extranet,VPN,e.t.c.) of network you will use to deploy?

Ans: For a private network that is similar to the World Wide Web and is intended for use by employees of a specific organization, the most appropriate type of network to deploy would be an Intranet. An Intranet is a private network that uses Internet technologies and protocols, it is only accessible to authorized users within an organization and allows employees to share information and resources internally, it can also be integrated with other internal systems.

Q.3(D): What is war driving and wifi piggybacking?

Ans: War driving is the act of searching for Wi-Fi networks by a person, typically in a moving vehicle, using a laptop or smartphone to map the location of wireless networks in a specific area and identify any vulnerabilities. Wi-Fi piggybacking is the act of using someone else's wireless network without their permission by connecting to an open (unsecured) wireless network or by cracking the password of a secured network. Both activities are considered unethical and potentially illegal as it involves unauthorized access to someone else's network or resources and can create security risks.

Q.3(E): If government organization wants to decide about disaster risk of an area or geographical crime patterns, which sort of information system they must use?

Ans: A government organization that wants to analyze disaster risk or geographical crime patterns would likely use a Geographic Information System (GIS) for data management, analysis, and visualization. GIS allows users to create maps and perform spatial analysis on data, such as crime patterns or natural disasters, to identify patterns, trends, and potential risks. It is suitable for identifying patterns, trends, and potential risks by combining different types of data and creating detailed and accurate maps.