

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swaraj Singh Enrolment No. 9920103039

Jaypee Institute of Information Technology, Noida

T1 Examination, Even 2023

B.Tech (CSE/IT), VI Semester

Course Title: Introduction to Large Scale Database Systems **Maximum Time :** 1 hr
Course Code : 21B12CS314 **Maximum Marks :** 20

CO1: Infer the background processes in queries & transactions, explain how these impact database design

CO2: Choose appropriate ways of storing data and optimizing queries

CO3: Explain challenge of big data and demonstrate the comparison of relational database systems with NoSQL databases

CO4: Compare & discover the suitability of large databases to store, query & analyse various forms of data

CO5: Apply techniques of data fragmentation, replication and allocation to design a distributed or parallel database system.

Q1[CO2, Marks 4] Consider a file of 16384 records where each record is 32 bytes long. The key field is of size 6 bytes and the file organization is unspanned (i.e., record of a file is stored inside the block only if it can be stored completely inside it). The file system has a block size of 1024 bytes and the size of a block pointer is 10 bytes. Find the average number of blocks to search for a record with indexing for the following 2 cases:

- The file is ordered on the key field.
- The file is ordered on a non-key field where size of the non-key field is 8 bytes and there are 12028 unique values for the field.

Q2[CO1, Marks 4] For the schedule below:

S: R1(A),W1(A),W2(A),R3(A),W2(A),W1(A),W3(A)

Is the schedule S view serializable? What is the necessary condition for any schedule to be view serializable?

Q3[CO1, Marks 5] a) Insert lock and unlock requests in the schedule S' and check if it is allowed by 2PL.

S': R1(X), R2(X), R3(X), R1(Z), R2(Y), R3(Y), W1(X), W2(Z), W3(Y), W2(Y)

What is the disadvantage of simple locking which does not follow 2PL?

b) Is the following schedule recoverable, strict or cascadeless?

S'': W1(A) W2(A) a2 c1 R3(A) R3(B) c3

(Note that a denotes abort and c denotes commit of a transaction)

Q4[CO3, Marks 3] As a database architect, you need to select a database management system for a video game development team. From player profiles to telemetry to leaderboards, data is crucial to make games work. The games are multiplayer, online and keep evolving. Will you select a relational or non-relational database for the video game data? Justify your choice.

Q5 [CO1, Marks 4] Apply timestamp ordering based concurrency control to the following schedule (Note st denotes start of a transaction):

S'''': st1, st2, st3, R1(A), R2(B), W1(C), R3(B), R3(C), W2(B), W3(A)

If Thomas Write Rule is applied, what will happen in the execution?

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

**T2 Examination, April 2023
B.Tech VI Semester**

**Course Title : Introduction to Large Scale Database Systems Maximum Time : 1 Hour
Course Code : 21B12CS314 Maximum Marks : 20**

CO1: Infer the background processes in queries and transactions & explain how these impact database design

CO2: Choose appropriate ways of storing data and optimize queries

CO3: Explain concept & challenge of big data & compare relational database system with NoSQL databases

CO4: Compare & discover suitability of appropriate large databases to manage, store, query & analyse forms of big data

CO5: Apply techniques for data fragmentation, replication and allocation to design distributed & parallel database system

Q1. [CO2, Marks 4] For the schema and query

Artist (Aid, name, age, country)

Painting(Tid, title, medium)

Sold(Aid, Pid, price)

SELECT A.name

FROM Artist A, Painting P, Sold S

WHERE A.Aid= S.Aid AND S.Pid= P.Pid AND A.country='USA' AND P.medium='oil'

Convert the SQL query into Relational algebra assuming no indexes. Show a physical query plan for this query. Suggest an alternate query plan for an optimized query. Will any index(es) be required for the optimization?

Q2. [CO2, Marks 7] a) Let R and S be two relations with the following schema

R(P,Q,R1,R2,R3) and S(P,Q,S1,S2)

Where (P,Q) is the key for both relations. Which of the following expressions are equivalent:

- (i) $\Pi_P(R \times S)$
- (ii) $\Pi_P(\Pi_{P,Q}(R) \cap \Pi_{P,Q}(S))$
- (iii) $\Pi_P(\Pi_{P,Q}(R) - (\Pi_{P,Q}(R) - \Pi_{P,Q}(S)))$

b) Give an instance of relations X and Y (each having A as one of the attributes) that shows whether the expressions are/are not equivalent

$\Pi_A(X-Y)$ and $\Pi_A(X)-\Pi_A(Y)$

c) If an index is available on the attribute branch_city for the relation Branch, describe how the following will be executed, where \neg is the negation

$\sigma_{\neg(\text{branch_city} < \text{"Chennai"})}(\text{Branch})$

Q3. [CO2, Marks 4] Consider query $\sigma_{(A < 12 \text{ AND } C \geq 10)}(X \bowtie Y)$ on relations X(A,B) and Y(B,C). Assume that $T(R)$ is the number of tuples in a relation R and $\text{DOM}(R,A)$ is the domain of values of attribute A in a relation (Note data values are uniformly and independently distributed in all columns)

$$T(X)=3000, T(Y)=2000$$

$$\text{DOM}(X,A)=30 \text{ (integers from 0 inclusive to 30 exclusive)}$$

$$\text{DOM}(X,B)=20 \text{ (integers from 0 inclusive to 20 exclusive)}$$

$$\text{DOM}(Y,A)=10 \text{ (integers from 5 inclusive to 15 exclusive)}$$

$$\text{DOM}(Y,B)=10 \text{ (integers from 0 inclusive to 10 exclusive)}$$

Estimate the statistics of $T(X \bowtie Y)$, $\text{DOM}(X \bowtie Y, A)$, $\text{DOM}(X \bowtie Y, B)$ and, $\text{DOM}(X \bowtie Y, C)$

Q4.. [CO4, Marks 5] Create a Restaurants collection in MongoDB, Insert documents with appropriate fields and values. Write Queries to:

- display all documents in the collection
- display fields: restaurant_id, name and cuisine but exclude the field _id for all documents in the collection
- How many restaurants have grade A
- Find restaurants serving cuisine 'Chinese' and having score more than 90
- Find the restaurants who do not prepare the cuisine 'American' and are located in India

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swaradik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

End Term Examination, May 2023

B.Tech VI Semester

Course Title: Introduction to Large Scale Database Systems Maximum Time: 2 Hrs

Course Code: 21B12CS314

Maximum Marks: 35

S. No.	Description
CO1	Infer the background processes in queries and transactions & explain how these impact database design
CO2	Choose appropriate ways of storing data and optimize queries.
CO3	Explain concept and challenge of big data & compare relational database system with NoSQL databases
CO4	Compare & discover suitability of appropriate large databases to manage, store, query and analyse forms of big data
CO5	Apply techniques of data fragmentation, replication and allocation to design distributed and parallel database systems.

Q1 [CO5] [5 Marks] Assume that we have 5 machines and a 1000 page STUDENTS (sid, name, gpa) table. Initially all pages start on one machine. Each page is of size 1 KB
a) How much network cost (in bytes) does it take to round robin partition the table?

b) How many I/Os will it take to execute the query

SELECT * FROM STUDENTS WHERE name='John';

c) If data is partitioned according to sid, how will the following query be executed?

SELECT * FROM STUDENTS ORDER BY gpa;

(Assume any parallel sort algorithm)

Q2 [CO2] [3 + 3 Marks]

a) A database table T1 has 2000 records and occupies 80 disk blocks. Another table T2 has 400 records and occupies 20 disk blocks. The memory buffer space available can hold exactly 1 block of records for T1 and 1 block of records for T2 simultaneously. No index is available. What are the number of block accesses required for nested-loop join and block nested-loop join with the most appropriate choice of table in outer loop?

b) For the schema:

ITEM (Name, Category)

STORE (Name, City, Address)

TRANSACTION (Itemname, Storename, Date)

and the query

Π category, city (σ Date='2023-05-05' AND City='NY' (ITEM \bowtie Name=Itemname
TRANSACTION \bowtie Storename=Name STORE))

Show 2 alternate query plans and select the most optimized one of the two.

Q3 [CO1] [5 Marks] a) Classify the schedule as strict, cascadeless or recoverable
T1: Read(A), T2: Write(A), T3: Write(C), T4: Read(B), T1: Write(B), T4: Write(C),
T3: Read(A), T2: Read(B), C1, C3, C2, C4

b) Prove T/F

- (i) $(A \cup B) \cup (C - D) = (B \cup (A \cup (C - D)))$
- (ii) $(A \cap (B - C)) \cap D = (A \cap ((C - B) \cap D))$

Q4 [CO4] [6 Marks] Consider a MongoDB collection Property(AgentID, AgentName, HouseLocation, HousePrice, House_Feature) where Agent refers to a real estate agent selling a house. Write MongoDB queries to

- a) Find houses with feature as '5BHK' being sold by AgentID '007'
- b) Use aggregation pipeline to find maximum price of house sold by each agent sorted by AgentName
- c) Find average price of 3BHK houses located in Delhi
- d) Find 3 highest priced houses in Mumbai and names of agents selling them

Q5 [CO5] [3+2+5 Marks] a) Fragment the following relation horizontally according to given information. Show the correctness of the performed fragmentation.

THEATRE (ID, name, city, no_of_movies)

Application 1 accesses the relation based on the theatre's city. Cities can be Mumbai, Delhi and Chennai. Application 2 requires data of theatres that have shown equal to or more than 100 movies.

b) For the horizontal fragmentation, can we guarantee reconstruction by having 2 fragments defined by predicates that are negation of each other?

c) Given the following queries on THEATRE and Access Frequency Matrix

- (i) Calculate Attribute Affinity matrix
- (ii) If clustered affinity matrix has attributes in order (ID, name, city), find the optimal placement of the attribute, no_of_movies

Q1: Select * from THEATRE
Q2: Select name from THEATRE
Where city='Delhi'
Q3: Select city from THEATRE
Where ID='T1'

	S1	S2	S3
Q1	10	5	5
Q2	0	5	5
Q3	0	10	10

Q6 [CO 3] [3 Marks] Consider a dataset containing information about customer transactions in a retail store as {prod_name, category, price, customer_id}

Write a Hadoop MapReduce pseudocode that calculates the total revenue generated by each customer.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida
End Term Examination, EVEN Semester 2023
B.Tech. VIth Semester

Course Title: Front End Programming
Course Code: 20B116CS326

Maximum Time: 2 Hr.
Maximum Marks: 40

After pursuing this course, the student will be able to:

- CO1: Demonstrate new technologies by applying foundation paradigms.
CO2: Build strong foundation for basics front end tools and technologies thereby making them understand the application development lifecycle.
CO3: Develop elegant and responsive front-end by leveraging latest technologies.
CO4: Explain activity creation and Android UI designing.
CO5: Develop an integrated mobile application to solve any complex real time problem.

All Questions are compulsory

- 1.) Create HTML from that collects an Email-Id and uses the JavaScript to validate it. Email-Id must starts with one or more uppercase or lowercase letters, digits or special characters (dot , %, underscore, plus and minus) before the "@" symbol, followed by one or more uppercase or lowercase letters, digits or hyphens before the "." symbol, and ends with two or more uppercase or lowercase letters.(5, CO2)
- 2.) Write HTML code to draw the following table.(5,CO2)

Header1	Header2	
	Subheader1	Subheader2
Row1	Cell1	Cell3
	Cell5	Cell6
Row2		Cell2
		Cell4

- 3.) Write a Java program that demonstrate method overloading and method overriding together. The program should have a class "Shape" with a method called "area" that return the area of the shape. The program should also have three classes called ""Circle", "Rectangle, and "Triangle" that inherits form the "Shape" class. Each of these classes should have their own "area" method that overrides the "area" method in the "Shape" class. Each class should calculate their own area. In addition, each of these classes should also have multiple constructors that demonstrate method overloading. For example, the "Circle" class should have a constructor that takes a radius, and another constructor that takes diameter. The program should create instances of each of the three classes using each of their constructor and call the "area" method for each object to demonstrate both method overloading and method overriding.(7.5, CO1)

- 4.) What will be the output of the following Java code(2.5, CO1)

```
class Test{
    static int array[]={10,20,30,50,60}
    static int findavg( ) {
        int i;
        int avg = array[0];
        for(i=0;i<array.length; i++){
            if(array[i]>avg)
                avg = array[i];
        }
        return avg;
    }
    public static void main(String[] args)
    {System.out.println(findavg());}
```

- 5.) Write a program in python to create an Employee table with different columns (ID, Name, and Salary). Add a primary key in ID column with AUTO-INCREMENT constraint. (5,CO5)

- 6.) Read the python code and answer the following.

a.) What will be the output of following python code(2.5, CO3)
Li = [20,1,20,41]
Ti= (44,55,64,65)
Li.sort()
Seq=0
for all in Ti:
 Li[Seq]+=all
 Seq+=1
 break
print(Li)

b.)The output of the following python code is [4,24,23,5,23]. What will be the line1 and line2.(2.5,CO3)
Mylist = [23,24,23,5,4]
Last =Mylist.pop(0)
First=Mylist.pop(-1)
.....line1
.....line2
print(Mylist)

- 7.) Write a python program that takes two digits m(row) and n(column) as input and generates a two dimensional array. The element value in the i-th row and j-th column of the array should be $i*j$. (5,CO3)

Note: $i=0,1,2,\dots,m-1$

$j=0,1,2,\dots,n-i$

Test data: Row=3, Column=4

Expected Result: [[0,0,0,0], [0,1,2,3],[0,2,4,6]]

- 8.) a) Your app goes from being “inactive” to being “paused”? Identify reasons for this situation.(2.5,CO4)

- b) When do you need to call onPause(), onResume() and onStop() ?(2.5,CO4)

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Name Swastik Singh

Enrolment No. 9920103039

Jaypee Institute of Information Technology, Noida

T1 Examination, Even 2023

B.Tech-III Year, 6th Sem

Course Title: Computer Networks & Internet of Things

Course Code: 18B11CS311

Maximum Time: 1 hr

Maximum Marks: 20

Note: Attempt all Questions

Sr. No.	Description
CO1	Defining the basics of networking, components, and underlying technologies
CO2	Illustrate the various key protocols in OSI model and TCP/IP protocol suite and Explain various application protocol.
CO3	Examine various transport protocols and its performance enhancing mechanism
CO4	Determine the shortest path for the network using various routing protocols and evaluate it.
CO5	Choose IP & MAC addressing mechanism and data link layer protocol to solve communication, error detection and correction problems.
CO6	Identification and description of various components, architecture and protocols of IOT and their real-life problems.

Q1: [CO1, CO3] [6 Marks] Answer the following questions briefly:

a) [CO1] [2 Marks] Which layer in the TCP/IP stack best corresponds to the phrase:

- “Bits live on the wire”
- “Error Handling from Hop-to-Hop”

b) [CO1] [2 Marks] Assume that Host H1 and Host H2 are connected as shown in the below diagram. Determine how many times a packet has to visit Transport & Network layer as defined in TCP/IP model from H1 to H2?

Host H1----Switch 1----Router 1----Router 2----Switch 2----Host 2

c) [CO3][2 Marks] What is the actual length of the data sent and the value of checksum for the following Hexadecimal format UDP Header: (E29301A2E00407BB)?

Q2: [CO2] [4 Marks] In the following diagram (Fig.1), each domain has a corresponding DNS Server.

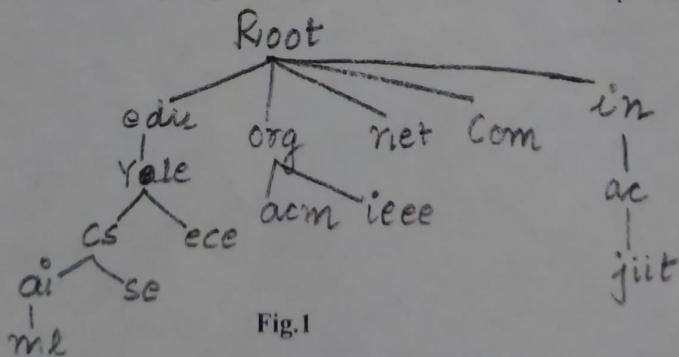


Fig.1

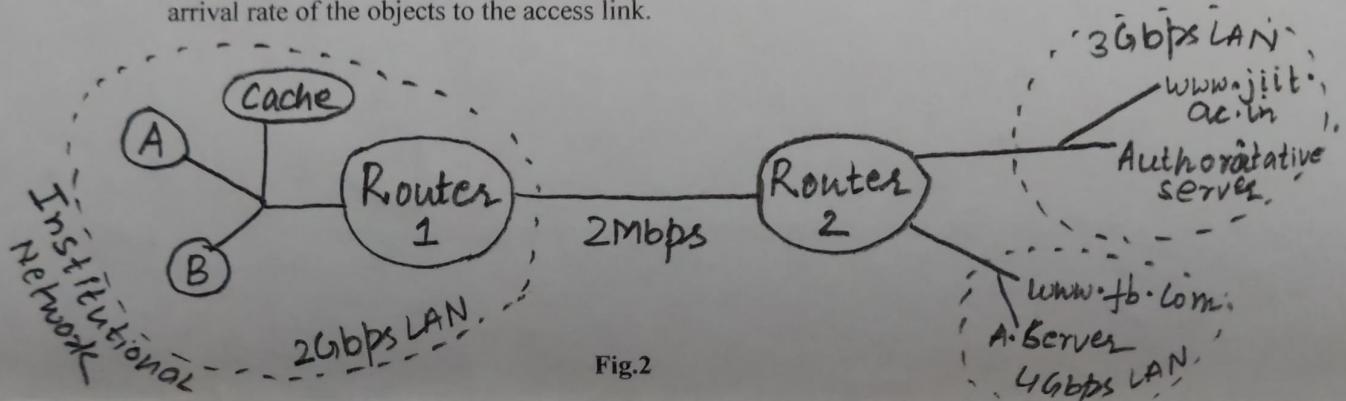
a) [2 Marks] Suppose, host `jiit.ac.in` wants to obtain the IP address of the Host `ml.ai.cs.yale.edu` through a recursive query request. List the sequence of query-response pairs involved in completely resolving the requested domain name.

b) [2 Marks] What all resource records are placed at TLD to obtain the requested web page. Mentioned in terms of 3 tuples record.

Name	Value	Type
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Q3 [CO2] [5 Marks] Consider user A requests from web browser for accessing the web page hosted on JIIT server. The requested web page consists of base HTML file embedded with 6 images, 5 videos, and 2 pdf files.

- [3 Marks] What will be the minimum number of TCP connections required for displaying the requested web page completely on your browser in each case:
 - Non-persistent and persistent connection with no cache implementation.
 - Non-persistent and persistent connection with cache implementation (where browser is requesting the webpage very first time)
 - Non-persistent and persistent connection with cache implementation (where requested webpage already exists in cache and no modification is there.)
- [2 Marks] Suppose the web cache employed with a cache hit ratio 0.6 at institutional LAN (Fig.2). Find out the total average response time (Access Delay + Internet Delay), if request rate is 14 requests/sec. Assume, each object and HTML file size is of 2KB, Internet delay is of 3 seconds. Note: To model the average response time (A_{rt}) use $A_{rt} = P/1-PQ$, where P is the average time required to send an object over the access link and Q is the arrival rate of the objects to the access link.



Q4: [CO1] [5 Marks] Consider the network with 10 links (L1 to L10), and 6 store and forward switches (R1 to R6). Consider sending a file of size 6Mb from source to destination with back-to-back packets. To minimize queueing delays, packets will be sent on different links. Firstly, equal number of packets are transmitted through links L2 and L3. Further, the packets sent on different links are highlighted in Fig.3. **Ignore processing and propagation delays.**

Note: Show all the computations.

Assumptions: File size = 6Mb, Packet size = 1 Mb,

All links are equidistant i.e. distance = 200 km, Propagation speed = 2.5×10^8

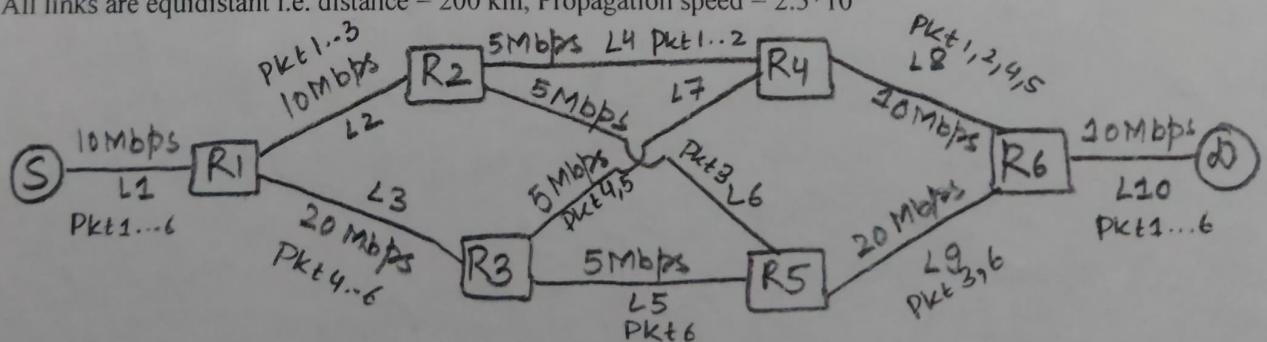


Fig.3

- [1 Mark] How many bits can accommodate on the L5 link at any given time?
- [1 Mark] At what time (in seconds) R2 finish sending all the packets it received?
- [1 Mark] Is there any time lag between packet 3 and 6 received at R5. If yes, how much is the time lag (in seconds)?
- [2 Marks] What is the time in seconds required to receive the file completely at "D"?

Name Swaraj Singh

Enrollment No. SG20103039

Jaypee Institute of Information Technology, Noida
T2 Examination, EVEN 2023
B. Tech. (CSE), VI Semester

Course Title: Computer Networks and Internet of Things
Course Code: 18B11CS311

Maximum Time: 1 Hr.
Maximum Marks: 20

After pursuing this course, the students will be able to:

- CO1: Defining the basics of networking components and underlying technologies
- CO2: Illustrate the various key protocols in OSI model and TCP/IP protocol suite and explain various application protocols.
- CO3: Examine various transport protocols and its performance enhancing mechanisms
- CO4: Determine the shortest path for the network using various routing protocols and evaluate it
- CO5: Choose IP & MAC addressing mechanisms and data link layer protocols to solve communication, error detection and correction problems
- CO6: Identification and description of various components, architectures and protocols of Internet of Things (IoT) and their real life problems

Note: Attempt all questions.

Q1. [CO3, CO4] Answer shortly:

- (a) [CO4] [1 Mark] Which field of IP header is used to avoid infinite looping of a packet?
- (b) [CO3] [1 mark] What will be the sender and receiver window size in case of selective repeat protocol if the 8 bits are used to represent the sequence numbers?
- (c) [CO3] [1 Mark] What will be the value of RTO if a retransmission occurs? (Assume RTO = 3.75 ms)

Q2. [CO4] JIIT has the following chunk of CIDR based IP addresses available for distribution: 245.248.128.0/20. The server manager wants to give half of this chunk of addresses to CSE department, and a quarter to ECE department, while retaining the remaining with himself for future purpose. Answer the following:

- (a) Write the valid efficient CIDR allocation of IP addresses to CSE and ECE department. Also, mention the subnet mask in each case. **[2 Marks]**

(b) How many hosts are possible in both departments as CIDR allocated in (a) **[1 Mark]**

(c) Considering, the server manager used IP address from the reserve lot, what will be the broadcast address used by the server manager to send a common message to CSE and ECE department. **[1 Mark]**

Q3. [CO4] [4 Marks] A UDP application writes 2040 bytes of data and further by adding its header send to next lower layer. This data passes through a link with MTU as 576 bytes. Is there a need of fragmentation at the network layer? If yes, then how many fragments are required? Specify, length, offset, MF flag value for each fragment. Calculate the efficiency for sending the required data.

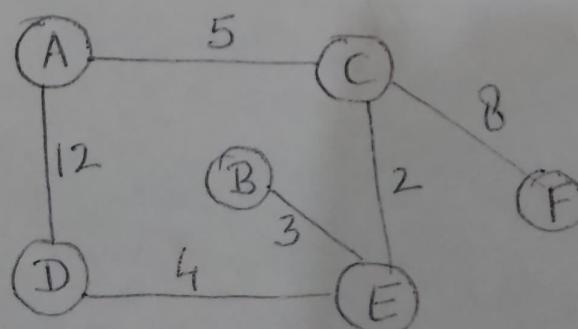
Q4. [CO3] Suppose TCP Tahoe sender "A" wants to send 20 KB file to "B". If, the MSS be 1 KB and CWND (Congestion window) is in slow-start phase initially with ssthresh 6. After exchanging initial sequence numbers between A and B, B announces RWND (Receiver window) size as 1 MSS. Subsequently, receiver window size received by the sender after transmission starts is 1, 2, 4, 2, 8, 5, 3, 1. Three ACKs events occur for segment 12 (Hint: CWN is 8). When 3 ACKs event occur, only the lost packet is retransmitted in the next round. As soon as the packet is received by the receiver, ACK is sent back. When there are back-to-back ACK's only the last ACKs are carrying advertisement of RWN size. Show the entire evaluation process of Congestion window as each segment is sent.

- (a) **[2 marks]** What is the effective window size at the start of the transmission and at the time when 6th packet is being sent by the sender?

(b) **[2 marks]** In which RTT (Transmission round) the retransmitted 12th segment is being sent?

- (c) **[2 Marks]** Suppose RTT value is 20 seconds, what would be the time when the last segment is being received at B?

Q5. [CO4][3 Marks] For the network below, using the link state algorithm, build the routing table for node D with syntax as (destination, distance, via which node). Assume all link state updates have been distributed.



POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 992003039

Jaypee Institute of Information Technology, Noida

End Term Examination, 2023

R.Tech VI Semester

S. No.	Description
CO1	Defining the basics of networking, components and underlying technologies.
CO2	Illustrate the various key protocols in OSI and TCP/IP protocol suite and explain various application protocols.
CO3	Examine various transport protocols and its performance enhancing mechanisms.
CO4	Determine the shortest path for the network using various routing protocols and evaluate it.
CO5	Chose IP and MAC Addressing mechanism and data link protocols to solve communication, error detection, and correction problems.
CO6	Identification and description of various components, architectures, and protocols of IoT and their real life problems.

Q1: [CO1, CO2, CO3, CO4] [10 Marks] Answer the following:

- a) [CO1] [2 Marks] Think about the network where all links have a data rate of 1.2 Mbps and use TDM with 16 slots. Assume host A needs 400 ms to create a complete circuit with host B before starting to send the file. How long will it take for the file to be sent from host A to Host B if it is 412 KB in size?

b) [CO2] [1 Mark] If the same number of objects are retrieved through different HTTP connections. Which among: non-persistent serial, non-persistent parallel or persistent parallel will be faster?

c) [CO3] [4 Marks] Suppose sender A wants to transmit 8 packets to host B in which every 4th packet is lost. Given a window size of 3, calculate and compare the number of transmissions required in case of Go-Back N and Selective Repeat. Also, discuss the case where less buffer space and sufficiently large bandwidth is available, than which protocol is best to choose w.r.t efficiency?

d) [CO4] [3 Marks] Suppose, Host 1 with IP address 193.162.2.97 is connected to Host 2 with IP address 193.162.2.80 via two routers R1 and R2. Also, R1 has two IP addresses, such as 193.162.2.135 and 193.162.2.110 respectively. Similarly, R2 has two IP addresses, such as 193.162.2.67 and 193.162.2.155 respectively. The netmask used in the network is 255.255.255.224. For the data provided above, how many distinct Subnets exists in the Network? Also provide the subnet IDs in each case.

Q2: [CO5] [3 Marks] If CRC polynomial generator $G(X) = X^4 + X + 1$ is used and sequence of bits to be sent is **1101101**. Compute the transmitted sequence of bits for this data. Now, if the data received is having an error i.e.: 3rd bit is changed from MSB. Show how the receiver will detect the error?

Q3: [CO5] [1.5+1.5+1=4 Marks] A receiver has received the following hamming code **01001101010110011010000111101**, at sender side, the parity bits calculated is given as **00101**.

- a) Calculate the parity bits at receiver side using even parity.
- b) Based on the given details, find out which bit is corrupted in the given hamming code.
- c) Find out the correct message send from the sender in plaintext (English) language if 8 bits represent 1 character.

M N

Q4: [CO5] [6 Marks] Suppose if there are two stations **\$1** and **\$2** attached to opposite ends of 2 km long cable having a propagation speed of 100 m/s, bandwidth 40 bps. Both nodes having only 1 frame to send consist of 2000 bits including header. Now, M attempt to transmit at time T=0 and N at T=2 secs. If first collision occurs consider M withdraws K=0 and N draws K=1 in the exponential back off algorithm. After first collision, M withdraws K=0 and N withdraws K=3 for any succeeding collision.

- a) What is the minimum size of frame for the ethernet to detect collision? What is the efficiency of CSMA/CD?
- b) At what time (in seconds) Node M and N both detect collision?
- c) How many bits station N has sent before detecting the collision?
- d) At what time (in seconds) last bit of jamming signals is received at M and N?
- e) At what time (in seconds) M and N schedules its retransmission?
- f) Is there is any second collision? If yes, what is time (in seconds) when both nodes detect collision again?

Q5: [CO5] [3 Marks] There are only P and Q stations on the Ethernet. Each has a fixed number of frames to send. P and Q crash while attempting to submit a frame. Giving P the victory in the first back-off race. Both P and Q attempt to transmit after P successful broadcast, and they eventually collide. Assume P again wins the second back-off race once more. After P's broadcast is a success, P and Q both try to send again and end up colliding. What is the probability that P wins the third Back-off race?

Q6: [CO6] [1+1+1 = 3 Marks] Consider a MQTT network scenario in which there are few clients such as car, temperature sensor, Moisture sensor, Mobile, Tablet, computer, backend database along with a MQTT broker. The car publishes its speed, temperature and moisture sensor also publish their data on broker. The mobile and the tablet subscribes car's speed and temperature readings. The computer subscribes temperature and moisture readings. All the published topics are stored in the backed database. Answer the following

- a) Can a mobile act as publisher? Identify the number of publishers and subscribers.
- b) It is possible to add any other device in this model?
- c) Write the possible topics for car and temperature sensor.

Q7: [CO6] [2+2+2 = 6 Marks] Answer the following:

- a) Which of the two layers in IoT reference architecture are known as cross cutting/vertical layers? Describe their responsibilities in detail.
- b) List the difference between CoAP and MQTT.
- c) Explain the LORA technology which is used in LORA WAN. How end devices join the LORAWAN network?

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103033

Jaypee Institute of Information Technology, Noida

T1 Examination, 2023

B.Tech, Semester VI

Course Title: Marketing Management
Course Code: 18B12HS 611

Maximum Time : 1 hr
Maximum Marks : 20

Course Objective: The student should be able-

- CO1 To illustrate the fundamentals of marketing, marketing environment and market research
- CO2 To model the dynamics of marketing mix
- CO3 To demonstrate the implications of current trends in social media marketing and emerging trends
- CO4 To appraise the importance of marketing ethics and social responsibility
- CO5 To conduct environmental analysis, design business portfolio and develop marketing strategies for business to gain competitive advantage

Q1 Kanhaiya Lal Group (KLG) of companies founded in 1970 is a well-known business conglomerate in North India with its diverse businesses. Its businesses include restaurants (KPMR) gold jewellery (KLGG) and few schools and colleges. The group had a humble start with a business of sweets and savouries which later grew into a chain of restaurants all over India.

The restaurants under the brand name KPMR (Khana Peeyo Mast Raho) catered to economically sensitive middle-income group and served hot Indian meals. The KPMR grew at an exponential rate until 2020 when it witnessed a sharp decline in sales probably due to COVID-19 related restrictions and lockdown. However, the sales have not picked up even after the restrictions were removed. The founders believe that it is probably because of changing preferences of people from dine-in to drive-in and online ordering of food. The founders want you to conduct a research to understand what is the cause of declining sales?

- a) What is market research and list 3 types of market research firms? [CO1, 2 Marks]
- b) List the do's and don'ts of a questionnaire [CO1, 2 Marks]
- c) Chalk out a detailed research plan (research approach, data source, sampling plan, research instrument and contact method) to identify why KPMR sales are falling. [CO1, 5 Marks]

Q2 The popularity of KLG group of schools and colleges has been consistently good. In 2022, the group opened two new universities. The group plans to now revamp their marketing strategy for their schools and universities and want to invest in digital marketing. KLG seeks your advice to devise the e-marketing strategy for its star business (education).

- a) Develop a e-marketing strategy for this star SBU of KLG. [CO3, 5 Marks]

Q3 The recent recession has seen a spurt in the price of Gold. The Jewellery Brand KLGG is a strong brand and is a major contributor in generating revenues for the group. Lately the founders of KLG are impressed by the buzz around artificial intelligence and therefore intend to invest in this domain. They recently acquired a small AI start-up.

- a) Draw a product mix of KLG group of companies. [CO5, 1 mark]
- b) To make foray into new technologies the group needs to strategically re-assess all its SBU's. Plot the SBU's on a BCG matrix and explain what strategies they should adopt for each SBU. [CO4, 3 Marks]

Q4 Answer any one. [CO2, 2Marks]

- a) Explain the difference between marketing orientation and selling orientation
- b) Explain Focus and Differentiation strategy as given by Porter

Name Sonastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida
T2 Examination, EVEN Semester 2023
B.Tech 6th Semester

Course Title: Marketing Management
Course Code: 18B12HS611

Maximum Time: 1 Hr.
Maximum Marks: 20

After pursuing this course, the student will be able to:

- CO1 To illustrate the fundamentals of marketing, marketing environment and market research
- CO2 To model the dynamics of marketing mix
- CO3 To demonstrate the implications of current trends in social media marketing and emerging marketing trends
- CO4 To appraise the importance of marketing ethics and social responsibility
- CO5 To conduct environmental analysis, design business portfolios and develop marketing strategies for businesses to gain competitive advantage

Attempt all questions.

- Q1. Emami Agrotech has launched blended vegetable oil by the brand name of Healthy and Tasty. Healthy and Tasty even got recognized as top product of the year 2022. It is enriched with essential Vitamin A, D & E, thus the oil also helps in lowering the risk of cardiovascular diseases, provides skin nourishment, helps in lowering cholesterol levels, reduces blood pressure and helps improve brain health. This unique proposition is relatively on higher price bracket when compared with other established vegetable oils. Refer to VALS2 and identify the customers who became its first customers. What kind of buying behavior is depicted by their target customer group and keeping in mind their behavior, discuss the challenges company would have faced while establishing themselves in the market. [1+3,CO3]
- Q2. Securicore is a leading security company that is planning to come up with well trained women car drivers, who are not only good car drivers but they can take care of the minor car repair, tire change in case of puncture and in case of extreme emergency they are also trained in security/ combat fight for the safety of their passengers. These female drivers will be known as car pilots and wear smart uniform. These car pilots will work on fixed monthly salary of Rs32000/-, which will be paid by the hiring customers. They will have 10 hours duty shift every day and have one weekly off. Their salary is on the higher side as mostly car driver's gets a monthly salary of around 20,000., but it can be justified with the value proposition, they are going to offer. Help the company in segmenting the market with at least three relevant characteristics, targeting the right segment and in designing a proper positioning strategy in order to streamline their marketing efforts. [4,CO4]
- Q3. Reliance industries have recently acquired a popular beverage brand, Campa Cola. Campa Cola was very popular in India in 1970's but got disappeared due to the competitors like Coke and Pepsi. Reliance industries are planning to encash its old popularity and give a tough fight to beverage leader's coke & Pepsi. They would also get competition from local beverage companies like Jayanti, Bovonto etc. Initially Reliance would be re-launching Campa Cola in three variants (Cola, Lime & Orange) in certain states of the country. Suggest the value proposition/ strategy to Reliance so that they can easily make market in this tough industry. Also anticipate how Pepsi and Coke would counter Campa Cola and hold their market. [4,CO4]
- Q4. Refer to the recent important purchase which you have made and explain the stimuli's and characteristics that affected your decision. Also discuss the buying decision process which you have studied. [2+2,CO5]
- Q5. a. Differentiate between Business Buying behavior & Consumer Buying Behavior with at least 4 characteristics [2,CO5]
b. Differentiate between Line extension & Brand extension strategies with example [2,CO5]

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Sonastik Singh

Enrollment No. 9120103039

Jaypee Institute of Information Technology, Noida

End term Examination, 2023

B.Tech VII Semester

Course Title: Marketing Management

Maximum Time : 2 Hr

Course Code: 18B12HS611

Maximum Marks : 35

After finishing the course, the students should be able to:

- CO1 To illustrate the fundamentals of marketing, marketing environment and marketing research
- CO2 To model the dynamics of marketing mix
- CO3 To demonstrate the implications of current trends in social media marketing and emerging marketing trends
- CO4 To appraise the importance of marketing ethics and social responsibility
- CO5 To conduct environmental analysis, design business portfolios and develop marketing strategies for business to gain competitive advantage.

Answer all questions

Q1 Yuvraj Singh along with his friend who was pursuing graduation from NUS, Singapore, developed an innovative product named "Petfluffy"- a self-cleaning, app controlled, litter box which revolutionizes cat waste disposal by improving the convenience, sanitation and cleanliness. It makes caring for one's cat convenient, easy and sanitary. The prototype of this innovative product is widely acclaimed and now the founders have collaborated for manufacturing and shipping the product.

a) Petfluffy wants to make a foray into the Indian market. Develop a market research plan to gain an insight into the segment that can be targeted for this innovative product tentatively priced at Rs 25000. (5 Marks; CO5)

b) Describe the difference between qualitative and quantitative research. (2 Marks; CO2)

Q2 a) What is Product life Cycle curve? Explain the different stages of PLC (5 marks, CO1)

b) Plot "Petfluffy" litterbox on PLC. (2marks; CO2)

Q3 a) Petfluffy is adopting "skimming price strategy". Suggest if this decision of theirs is good to grow their market share. (5 Marks; CO2)

b) Explain any two alternate pricing strategies that can be adopted by Petfluffy. (2 Marks; CO2)

Q4 Petfluffy uses paper bags with plastic seals for waste disposal. After a soft launch of the product in Indian market, the twitter was full of tweets from environmentalists that criticized Petfluffy for promoting consumerism and also adding to the pollution (plastic waste).

a) Illustrate the business actions that Petfluffy can take towards socially responsible marketing. (5 Marks; CO4)

b) Explain what is societal marketing. (2Marks; CO4)

Q5 In the light of uproar from environmentalists, the founders of Petfluffy want you to prepare a promotional message of the product with an objective to (1) educate the customers about its use and (2) promote the green practices taken up by them under corporate social responsibility such as their plantation drives.

a) Distinguish between Advertising and Public Relations (3 marks; CO3)

b) Draw an advertisement choosing and appropriate (i) execution style (ii) copy and (iii) illustration for a print advertisement for Petfluffy.(4 marks; CO5)

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

T1 Examination, 2023

B.Tech VI Semester

Course Title: Software Engineering

Maximum Time: 1 Hr

Course Code: 15B11CI513

Maximum Marks: 20

C314.1	Explain software engineering principles and software process models for project development.
C314.2	Identify functional and non-functional requirements of a software project and design document software requirement specification.
C314.3	Design, represent and document software requirement specification. Plan and execute activities for a software project.
C314.4	Apply UML modelling for software design from software requirements specification.
C314.5	Analyze code checklist. Perform code Reviews, Code Refactoring, and Code optimization, design pattern.
C314.6	Apply testing principles, develop and implement various manual and automated testing procedures, formal methods.
C314.7	Evaluate software in terms of general software quality attributes and possible trade-off presented within the given problem.

Note: Attempt all the questions.

Q.1 [CO1][4 Marks] “A company wants to develop a new music streaming platform like spotify. Spotify’s engineering team faced challenges in the early stages of their development process, including difficulty in managing the complexity of their codebase and coordinating the work of their distributed team members”

Based on the above case study which model would you proposed to develop the above application and why? Explain in details.

Q.2 [CO1][6 Marks] Product manager has planned a list of activities culminating in the inaugurate launch of the new product. These are given in the table below:

Activity	P	M	O	Immediate Predecessor(s)
A	20	10	5	-
B	12	7	5	-
C	12	10	8	A
D	40	20	7	C
E	90	60	30	D
F	14	10	7	D
G	50	30	20	C
H	12	40	8	E,F,G
I	6	4	3	B
J	1	1	1	H,I

What is the probability that product manager will be able to complete the product launch within 80 day-time. Consider the z value(s) with their corresponding probability.

Z value	Probability
2.77	10%
5.83	18%
-2.77	0.3%

p.t.o

Q.3 [CO2][5+5 Marks] Problem: "A large scale farm is facing challenges in monitoring and optimizing crop growth and yield. The traditional methods of monitoring weather conditions and soil moisture are time consuming and labour-intensive. Moreover, the farm faces significant losses due to pest attacks and improper irrigation systems".

Approach: A smart agriculture system is proposed to address the farm's challenges. The system will collect the data from multiple sensors installed across the farm, including temperature, humidity, soil moisture and weather forecast data. The collected data will be analyzed to provide insights into the best irrigation and fertilization practices and to detect pest, diseases and weather changes.

The smart agriculture system will consist of a central control unit, sensors and actuators. The sensors will be installed in the field to collect the data on environmental factors while the actuators will control irrigation and fertilization system to optimize crop growth. The central control unit will store and process the data and provide real time alerts to farmers in case of any issue.

- a) Based on the above case study describe the functional and non-functional requirements and outcome.
- b) Write down the requirements elicitation techniques with explanation for the above case study.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

T2 Examination, 2023

B.Tech VI Semester

Course Title: Software Engineering

Maximum Time: 1 Hr

Course Code: 15B11CI513

Maximum Marks: 20

C314.1	Explain software engineering principles and software process models for project development.
C314.2	Identify functional and non-functional requirement of a software project and design document software requirement specification.
C314.3	Design, represent and document software requirement specification. Plan and execute activities for a software project.
C314.4	Apply UML modelling for software design from software requirement specification.
C314.5	Analyse code checklist. Perform Code Reviews, Code Refactoring, and Code Optimization, Design Pattern.
C314.6	Apply testing principles, develop and implement various manual and automated testing procedures, formal method.
C314.7	Evaluate software in terms of general software quality attributes and possible trade-off presented within the given problem.

Note: Attempt all the questions.

Q.1 [CO4] [5 Marks] An online movie ticket booking system facilitates the purchasing of movie tickets to its customers. E-ticketing system allows customers to browse through movies currently playing and book seats, anywhere and anytime. This ticket booking service should meet the following requirements: It should be able to list the cities where affiliate cinemas are located. Each cinema can have multiple halls and each hall can run one movie show at a time. Each movie will have multiple shows. Customers should be able to search movies by their title, language, genre, release date, and city name. Once the customer selects a movie, the service should display the cinemas running that movie and its available shows. The customer should be able to select a show at a particular cinema and book their tickets. The service shows to customer the seating arrangement of the cinema hall. The customer should be able to select multiple seats according to their preference. The customer should be able to distinguish between available seats and booked ones. The system should send notifications whenever there is a new movie, as well as when a booking is made or cancelled. Customer of our system should be able to pay with credit cards or cash. The system should ensure that no two customers can reserve the same seat. Customers should be able to add a discount coupon to their payment.

Draw a detailed Use Case Diagram for this online movie ticket booking system.

Q.2 [CO4] [5 Marks] A homemaker wants to organize the birthday party at home. She needs to bake a cake for birthday party for her kid. For the cake, she checks the recipe and its ingredients availability, if items are unavailable then purchase those items. Once she collects all the ingredients, she decides to mix all dry and wet items separately as per the measurements. To prepare the cake, oven is preheated and all ingredients are mixed well.

Once the oven is heated with the required temperature, bake the cake for 15 minutes or it is not ready. Apart from the cake, she needs to prepare the snacks. Once the cake and snacks are ready, serve these items to kids.

Draw the activity diagram for the above case study. Mention initial state, final state, merge, join, fork, decision events in the activity diagram whenever applicable.

Q.3 [CO4] [2+3 Marks] A modern auto plant needs to be implemented. Each worker within the plan has one specific job, like mounting a cylinder head on an engine. The worker does one thing and does it the same way every time. The worker doesn't have any idea about the vehicle in which the engine will be installed. The engine, when completed, might be set in a 2-door closed roof vehicle or it may go in a small truck. The engine doesn't care which vehicle it's installed in and the vehicle doesn't care which engine is used. The connections between the engine and the vehicle are designed to be generic and engine specific connection points are minimized.

- a) Identify if modules are tightly coupled or loosely coupled. Explain how cohesive each module is implemented. Justify your answer.
- b) What problems are likely to arise if two modules have high coupling.

Q.4 [CO5] [2+3 Marks] Explain the prime objectives of Code Refactoring.

Also, perform a code refactoring technique on the below C function:

```
//C function starts
int* getSumOfPairs (int arr[], int length, int targetSum)
{
    int* result = (int*) malloc (2*sizeof(int));
    for (int i = 0; i < length; i++) {
        for (int j = i+1; j < length; j++) {
            if (arr[i] + arr[j] == targetSum) {
                result[0] = arr[i];
                result[1] = arr[j];
                return result;
            }
        }
    }
    return NULL;
}
//C function ends
```

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swaastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

End Term Examination, 2023

B.Tech VI Semester

Course Title: Software Engineering

Maximum Time: 2H

Course Code :15B11CI513

Maximum Marks: 35

C314.1	Explain software Engineering principles and software process model for project development.
C314.2	Identify functional and non-functional requirements of a software project and design document software requirement specification.
C314.3	Design, represent and document software requirement specification. Plan and execute activities for a software project.
C314.4	Apply UML modelling for software design from software requirement specification.
C314.5	Analyze code checklist. Perform code Reviews, Code Refactoring, and Code optimization, design pattern.
C314.6	Apply testing principles, develop and implement various manual and automated testing procedures, formal methods.
C314.7	Evaluate software in terms of general quality attributes and possible trade-off presented within the given problem.

Note: Attempt all questions.

Q.1[CO1][3M] You have been appointed as a project manager within information system organisation. Your job is to build an application that is quite similar to other your team has built, although this one is larger and more complex. Requirements have been thoroughly documented by the customer. What software process model would you choose and why? Explain in details.

Q.2[CO2][3M] A smart traffic management system is an intelligent transportation system that uses advanced technologies, such as sensors, cameras, and data analytics to manage traffic flow in a more efficient and effective manner. The system aims to reduce traffic congestion, improve safety and enhance the overall driving experience for road users.

Write functional and non-functional requirements for the above scenario. Explain each in detail.

Q.3[CO3][2+2+3=7M] You are a software engineer working for a software development company. Your company has been approached by a popular restaurant chain to develop an online food ordering system. The restaurant chain wants to streamlines their order management process and provide an easy-to-use platform to their customers to place and order online. As part of the project, your team is responsible for creating the software requirement specification documentation. Assume the following based on the given data:

- Identify and list the key stakeholder for the online food ordering system.
- Highlight any limitation that may impact the system's development or operation.
- Conduct interview or surveys with the stakeholder to gather requirements for the system. Based on the collected information list the functional and non-functional requirements.

Q.4[CO4][3M] Develop a sequence diagram that shows how a student interacts with a university system when they want to register for a course. In this case, some courses have a limited number of available spots, so the registration needs to include a check to ensure

there are available places. Additionally, it's assumed that the student uses an electronics course catalog to gather information about the courses that are currently available.

Q.5[CO5][3M] Refactor the following C code to improve the efficiency:

```
//Code Starts
#include<stdio.h>
#include<stdbool.h>
#include<string.h>
bool isPalindrome(char str[]){
int length = strlen(str);
for(int i=0; i<length/2;i++){
if(str[i] != str[length-1-i]){
return false;}}
return true;} //code ends
```

Q.6[CO6][4+4=8M] a) Compute the function point, productivity, documentation, cost per function for the following data: No. of user inputs = 24 with average weighing factor, No. of user outputs = 46 with low weighing factor, No. of inquiries=8 with high weighing factor, No. of internal files=4 with average weighing factor, No. of external interface files=2 with low weighing factor. Effort=36.9P-M, Technical documents=265 pages, User documents=122 pages, Cost=\$7744/month and various processing complexity factor are 4,1,0,3,3,5,4,4,3,3,2,2,4,5.

b) Consider a project to develop a full screen editor. The major components identified are: i) Screen edit ii) Command language Interpreter iii) file input and output iv) Cursor Movement v) Screen Movement. The size of these are estimated to be 4K,2K,1K,2K and 3K delivered source code lines respectively. For this project some significant cost drivers are also estimated: Required software reliability is high i.e. 1.15, Product complexity is high i.e. 1.15, Analyst capability is high i.e. 0.86, Programming Language Experience is low i.e. 1.07 and all the other cost drivers are nominal i.e. 1.00. Use COCOMO to determine effort, development time and staffing.

Q.7[CO7][4+4=8M] a) A digital Clock (24 hrs format) has been implemented in a website. Website opens only in between 10:00:00 to 17:00:00 based on this digital clock timing. Explain boundary value analysis and robustness test cases for the timing when website is functional or not functional (consider Hours, Minutes, Seconds format).

b) Calculate the cyclomatic complexity for the given code:

1. { int x,y, power;
2. float z;
3. scanf("%d%d", &x, &y);
4. if(y<0)
5. power= -y;
6. else power = y;
7. z=1;
8. while(power !=0)
9. { z=z*x;
10. power= power-1;}
11. if(y<0)
12. z=1/z;
13. printf("%f", z);
14. }

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Sonstik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

Term-1 Examination February 2023

B.Tech VIth Semester

Course Title: Open Source Software Development
Course Code :21B12CS320

Maximum Time: 1 Hour
Maximum Marks 20

S No.	Course Outcomes
CO1	Understand the benefits of using open source software and key concepts
CO2	Understand the applications of open source repository for collaborative development and version control
CO3	Understand the Linux architecture and its utilization used in open source software development
CO4	Understand the concept of virtualization and cloud computing using open source tools
CO5	Develop applications using the open source language and tools

Q1 [CO1] [2 Marks] How do copyleft and copyright licenses impact the development and distribution of the software? Can you provide examples to support your answer?

Q2 [CO2] [3 Marks] Person A and B belong to same IT team in an MNC but are in different time zones. Person A made some changes to the code and committed on to the main system before logging off for the day. Later person B logged in his time zone and now he wants to examine the changes along with adding some of his code as well. Write all the steps followed by person A and later by person B on the git for this work flow.

Q3 [CO3] [2 + 1.5 + 1 + 1 + 1.5 = 7 Marks] Create a file names "Student.txt" having following information:

Roll	Name	Batch	Subject1	Subject2	Subject3
1	ABC	F1	84	78	59
2	PQR	F1	75	84	62
3	XYZ	F1	54	57	40
4	UVW	F1	60	50	87

- Write an awk to print details of all the students having marks more than 75 in any one of the subjects.
- Write an awk to print the name of the student who stood first in the class.
- Write an awk to change the default delimiter of the file to pip ":" symbol.
- Write an awk to print average marks in each subject.
- Write an awk to find the student name who stood 2nd in the class

Q4 [CO3] [1 + 1 + 1.5 + 1.5 + 1 = 6 Marks] Write Linux commands for the following:

- Create a directory (experiment) with the text files (file1.txt, file2.txt, file3.txt)
- Fill each text file with sample data containing empid, name, city and the use the "sed" command to replace the names beginning with "k" with "Linux".
- Use the grep command to search the word "Linux" in all text files and display the file names along with line number where the word is found.
- Suppose the "experiment" directory contains several sub-directories each containing music files with different extensions. Write a command that will find all ".mp3" files in the "experiment" directory and move them to a new subdirectory named "mp3".
- Use the "top" and "ps" command to identify processes that are consuming high amounts of resources.

Q5 [CO3] [2 Marks] Suppose you have a file called "inventory.txt" with following format: Itemname, Description, Quantity, Price. Write an "sed" command that will find all the items that have quantity equal to zero and replace the Price with "OUT OF STOCK". The output should be in the same format as input.

POSSESSION OF MOBILES IN EXAM IS INFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida
T2 Examination, EVEN 2022-23
B.Tech 6th Semester

Course Title: Open Source Software Development
Course Code: 21B12CS320

Maximum Time: 1 hour
Maximum Marks: 20

Sno	Course Outcomes
CO1	Understand the benefit of using Open source software and its key concepts
CO2	Understand the applications of open source repository for collaborative development and version control
CO3	Understand the Linus architecture and its utilities used in Linux
CO4	Understand the concept of virtualization and cloud computing using Open source tools
CO5	Develop applications using Open source language and tools

Q1. [CO5] [Marks 2] What is the android runtime (ART) and how does it differ from the Dalvik runtime?

Q2 [CO5] [Marks 2] List and describe four key components of the android framework used in app development, their importance and functionalities.

Q3 [CO5] [Marks 4] Given a list L1 = ['e', 'o', 'b', 'a', 'm', 'l', 't', 'k'] containing characters and another list containing words. Find the valid words (that can be created using characters list L1). Repetition of characters is allowed.

Input List: ['go', 'bat', 'me', 'eat', 'goal', 'boy', 'run', 'look', 'come']
Output: ['go', 'me', 'goal', 'look']

Q4 [CO5] [Marks 4] Write the output of the following program:

```

mydict = {'G1': {'x': [1,2,3], 'y': [1,2,3,4,5]},  

          'H1': {'x': [3,9], 'y': [5,3,2], 'm': [3,1,0]}},  

rm = dict()  

for key, val in mydict.items():  

    for key_in, val_in in val.items():  

        if key_in not in rm:  

            temp = dict()  

        else:  

            temp = rm[key_in]  

            temp[key_in] = val_in  

            rm[key_in] = temp
print(str(rm))

```

Q5 [CO1] [Marks 8] Suppose you have a dataframe named "Sales_data", that contain the sales data for a store. The column names are "Date", "Product_Name", "Sales". Write python code to solve for following queries.

1. Find the total sales of each month and the month having highest sales
2. Find the top three selling products for each month.
3. Plot a bar graph showing the total sales of each month.
4. Plot a pie chart showing the sales distribution by products.
5. Calculate the percentage of total sales contributed by each product.
6. Create a new column named "Revenue", which contains the revenue generated by each sale.
7. Group the data by product and calculate average revenue by per sale.
8. Sort the data by average revenue per sale in descending order.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Sonstik Singh

Enrollment No. 9920103033

Jaypee Institute of Information Technology, Noida
End Term Examination, EVEN Semester 2023
B.Tech. VIth Semester

Course Title: Open Source Software development
Course Code: 21B12CS320

Maximum Time: 2 Hr.
Maximum Marks: 35

CO No.	Course Outcome
CO1	Understand the benefits of using open source software and key concepts
CO2	Understand the applications of open source repositories for collaborative development and version control
CO3	Understand the Linux architecture and its utilities used in OSSD
CO4	Understand the concepts of virtualization and cloud computing using open source tools
CO5	Develop applications using open source languages and tools

Q1. [CO3] [Marks 5] Write a shell script that prompts the user for a positive integers and then display all the numbers from 1 to that integer. The script should use a loop to accomplish this task. Additionally, the script should calculate the sum of all the numbers displayed and output the total at the end. Ensure that the user enters a valid positive integers, otherwise display an error message and prompts again.

Q2. [CO2] [Marks 5] Consider a log file containing records of user activities; each record consists of a timestamp, username, and the duration of the activity in seconds, separated by commas. Write an **awk** command that accomplishes the following:

1. Reads the log file (specified by the user) line by line.
2. Extract and print the username and duration from each line.
3. Calculates the total duration for each user by summing up the durations.
4. Keeps track of the username with the longest total duration. Display the username with the longest total duration at the end.

Q3. [CO4] [Marks 4 + 1 + 2 + 1 = 8] Write the commands for following:

1. Write a docker file and set the base image as “python 3.9” and installs the necessary dependencies to run a flask web application. Include an instruction to copy the flask code into the containers and set the default working directory.
2. Build a docker image from a docker file created in the 1 part. Include the command to specify the image name, tag and build context.
3. Launch a docker container from the image created in the 2 part. Include the command to specify the container name, port mapping, and run options.
4. How do you execute a Bash command in a running docker container? Provide an example that connects to a container named “my-firstcontainer” and runs the “ls” command in the root directory.

Q4. [CO4] [Marks 3] How does openstack compare to other proprietary cloud computing platforms, such as AWS, Azure and Google cloud?

Q5. [CO4] [Marks 2] What is the difference between Openstack Swift and Cinder? How are they used in openstack?

Q6. [CO4] [Marks 2] How modern hypervisors do integrates with cloud orchestration tools, such as openstack to provide scalable virtualizations for cloud environment?

Q7. [CO1] [Marks 3] What is licensing of software. How it impacts its distribution. Explain with help of various types of licenses available for software distribution.

Q8. [CO5] [Marks 3 + 2 + 2 = 7] While developing a music player android application that allows users to select a song from a list and play it. Implement the following scenarios using intents to pass data between activities:

1. Create an activity called “songactivity” that displays a list of songs. Each song item should have a title and artist.
2. When a user selects a song from the list, it should launch a new activity called “playeractivity”
3. In the “playeractivity”, display the selected song title and artist.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swaatik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida

T1 Examination, Even Semester 2013

Course Title: Project Management
Course Code: 16B1NHS631

Max Time: 1 Hr
Max Marks: 20

After pursuing this course, the students will be able to:

CO1	Apply the basic concepts of project management such as features, objectives, life cycle, model and management, in a given context.
CO2	Analyze projects and their associated risks by understanding the various theoretical frameworks, non-numerical and numerical models in order to make correct selection decisions.
CO3	Evaluate the stages of project management and identify and determine correct techniques for planning and scheduling.
CO4	Evaluate management processes for budgeting, controlling and terminating projects in order to achieve overall project success.

Attempt all questions.

- Q1. Aroma bakery is known for its fresh fruit pastries. The bakery makes 30 fresh fruit pastries daily and distributes all the unused pastries as charity to the kids of nearby slum area. The demand for the fresh fruit pastries varies from 0 to 50 every day. The making cost of each pastry is Rs 40/- and they sell it at 100% profit margin. In case of out of stock situation, bakery owner puts a penalty of Rs 20/- per piece of pastry. Based on the past 3 months sales data, owner makes the below demand distribution.

Daily Demand	0	15	25	35	45	50
Probability	.03	.15	.20	.48	.12	.02

If the random numbers are as below:

35, 78, 09, 51, 56, 87, 15, 14, 68 & 09

a. Simulate the demand for the next 10 days and analyze the net profit/loss [4,CO2]

b. If bakery starts making 35 pastries every day, analyze profit/loss and suggest whether they should continue with making 30 pastries or 35 pastries per day. [2,CO2]

- Q2. Sagar is considering three project proposals X, Y & Z. Each proposal requires an initial investment of Rs 5 Lakhs and each project has the life of 3 years. Each project gives the same total cash inflow of Rs 6 Lakhs in three years. However, Project X gives Rs 1 Lakh in the first year and cash flows in subsequent years increases linearly, Project Z gives Rs 3 Lakhs in the first year and cash flows in subsequent years decreases linearly and Project Y gives uniform cash flows in every year. He is considering 10% as required rate of return.

a. Analyze which project Sagar should choose and why? [2,CO2]

b. If investment required in X, Y & Z projects are Rs 4 Lakhs, Rs 4.5 Lakhs & Rs 5 Lakhs respectively, then help Sagar in analyzing and finding out the most profitable project. [2,CO2]

- Q3. If a project requires initial investment of Rs 30 Lakhs and is expected to give cash inflows of Rs 6 Lakhs, Rs 7 Lakhs, Rs 11 Lakhs and Rs 12 Lakhs in next 4 years. Analyze the payback period for this project. [2,CO2]

- Q4 a. Discuss the different phases of project life cycle and interpret key issues pertaining to each phase. [4*2, CO1]
 b. Refer the stages of a conventional project and draw the curve between project completion and time.
 c. Differentiate between Functional Manager and Project Manager in terms of their scope of work & required expertise.
 d. Skills required in a Project manager can be divided into 4 different categories. Briefly explain each category and interpret their relevance.

POSSESSION OF MOBILES IN EXAM IS UFM PRACTICE.

Name Swastik Singh

Enrolment No. 9920103033

Jaypee Institute of Information Technology, Noida

T2 Examination, Even 23

Semester VI

Course Title: Project Management

Maximum Time: 1 hr

Course Code: 16B1NHS631

Maximum Marks: 20

After pursuing this course, the students will be able to

CO1	Apply the basic concepts of Project Management such as features, objectives, lifecycles, model and management in a given context.
CO2	Analyze projects and their associated risks by understanding the various theoretical frameworks, non -numerical and numerical models in order to make correct selection decisions
CO3	Evaluate the stages of project management and identify appropriate techniques for planning and scheduling.
CO4	Evaluate management processes for budgeting, controlling and terminating projects in order to achieve overall project success.

Attempt all questions

Q1 In light of the steep drop in new COVID -19 cases and rise in recovery rate, the youth club of your college decided to host an annual fest Moksha2023. You have been assigned as the head of the youth club (project manager). The 3 main events that mark Moksha 2023 are 1) Techno-cult – a technical event 2) Moksha Literati- a literary event 3) Dance Bon- a musical event.

a) Planning is essential for the smooth conduct of the fest. Draw a WBS for the above project. [3 marks, CO3]

b) You have 3 student managers as respective event head. Design a responsibility matrix for at least 4 major tasks required to be accomplished for the three events. [3 marks, CO3]

c) As the team head you are required to allocate budget for the fest. Explain which budgeting process will you adopt and why? [3 marks, CO4]

d) One thing that characterises such student events is interpersonal conflicts. As a project manager, discuss how you plan to resolve these conflicts. [1 mark, CO4]

Q2 The payoff matrix of a game is given below. Find a) the optimal strategies and b) the value of the game for Player A and Player B. [2marks, CO2]

Player A	Player B				
	Strategies	1	2	3	4
I	-5	-3	-3	2	0
II	0	-1	-2	-1	-1
III	-7	-6	-3	-5	3
IV	2	0	-7	-1	-9

Q3 Travel and tourism sector is a major contributor to the Indian GDP. A leading business conglomerate is planning to enter this sector and intends to invest in the development of parks and hotels. The first project that this conglomerate has selected is to develop an Ayurveda Park. The initial investment in the project is Rs.90,000. The expected cash inflows are as given below. The management adopts risk adjusted discount rate method to calculate the NPV. However, on second thoughts the management decides to adopt a more robust method of risk assessment i.e. certainty equivalent method. With risk adjusted discount as 10% and risk-free rate of return as 6%, assist management to take a decision regarding this investment by calculating the NPV by both the methods. [6marks, CO3]

Year	1	2	3	4	5
Expected Cash inflows (Rs)	45000	45000	40000	40000	35000
Certainty Equivalent factor	1	0.8	0.6	0.6	0.2

Q4 Answer briefly: [2 marks, CO1]

a) What is scope creep?

b) Explain derivative projects

POSSESSION OF MOBILES IN CLASS ROOM IS UFM PRACTICE.

Name Swastik Singh

Enrollment No. 9920103039

Jaypee Institute of Information Technology, Noida
End Term Examination EVEN Semester 2023
B.Tech. Y Semester

Course Title: Project Management
Course Code: 16B1NHS631

Maximum Time: 2 Hrs.
Maximum Marks: 35

After pursuing this course, the student will be able to:

CO1	Apply the basic concepts of project management such as features, objectives, life cycle, model and management, in a given context
CO2	Analyze projects and their associated risks by understanding the various theoretical frameworks, non-numerical and numerical models in order to make correct selection decisions
CO3	Evaluate the stages of project management and identify and determine correct techniques for planning and scheduling
CO4	Evaluate management processes for budgeting, controlling and terminating projects in order to achieve overall project success.

Note: Attempt all questions.

- Q1. You are working with a prestigious firm as a project manager and you are assigned with a very critical project. The relevant information about the important activities of this project are as below:

Activities	Precedence	Normal duration	Crash duration	Normal cost	Crash cost
A	-----	7	5	6000	10000
B	A	4	2	5000	7000
C	A	5	5	6000	6000
D	A	6	4	9000	11000
E	B,C	7	4	8000	11000
F	C,D	5	2	8000	14000
G	E,F	6	4	8000	16000

*crash cost is complete crash cost for the activity

** Partial crashing is allowed for all the activities

- a. Draw the network diagram and identify the minimum time to complete the project as well as project cost in normal circumstances [2,CO3]
 - b. Calculate Early Start (ES), Early Finish (EF), Late Start (LS), Late Finish (LF) and slack for every activity. [2,CO3]
 - c. If your client demands to complete this project in least possible time and is ready to take the additional cost, evaluate what will be the least possible time for the project and project cost after crashing. [4,CO3]
 - d. What is the probability of completing this project in the least calculated time? [1,CO3]
- Q2. Discuss the Project termination techniques adopted for successful projects, sacred cow projects and for projects which comes under controversy because of government regulations or negative publicity. Evaluate and identify the suitable Termination process for each of the mentioned scenarios. Why project manager is not preferred as Termination manager? Give your opinion. [6+, CO4]
- Q3. Discuss why controlling is extremely critical to ensure the project success? Evaluate the benefits and drawbacks of S-curve, Milestone analysis and Personnel reassignment control tools. [1+, CO4]
- Q4. Rajveer is a quality analyst and checking 3 different types of defects (A, B &C). The defect 'A' leads to the scrapping of items, however in case of defect 'B' & 'C', items are reworked. The time required for rework in defect 'B' is 15 minutes and in defect 'C' is 30 minutes. The probabilities for defect 'A', 'B' & 'C' are 0.15, 0.20 & 0.10 respectively. Use Monte Carlo simulation and analyze the 10 items coming out of assembly line and identify the number of items without any defects, items scrapped and total minutes of rework time. Use the following random numbers, [6,CO2]
- | | | | | | | | | | | |
|------------|----|----|----|----|----|----|----|----|----|----|
| Defect 'A' | 48 | 55 | 91 | 40 | 93 | 01 | 83 | 63 | 47 | 52 |
| Defect 'B' | 47 | 36 | 57 | 04 | 79 | 55 | 10 | 13 | 57 | 09 |
| Defect 'C' | 82 | 95 | 18 | 96 | 20 | 84 | 56 | 11 | 52 | 03 |
- Q5 Apply your understanding on Project management and write short notes: [3+, CO1]
- a. Responsibilities of a Project Manager
 - b. Project Management Environment