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Syllabus (Term - 2)

Unit I: Computational Thinking and Programming - 2

- Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Unit II: Computer Networks

- Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)
- Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)
- Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fibre-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)
- Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
- Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)
- Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP
- Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Unit III: Database Management

- Database concepts: introduction to database concepts and its need
- Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)
- Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command
- Aggregate functions (max, min, avg, sum, count), group by, having clause, joins: Cartesian product on two tables, equi-join and natural join
- Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

Unit 1

TOPIC:Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Q. NO	QUESTIONS WITH ANSWER	MARKS																				
1	Give any two characteristics of stacks.	2																				
ANS	Characteristics of Stacks: It is a LIFO data structure, The insertion and deletion happens at one end i.e. from the top of the stack																					
2	Define a data structure.	2																				
ANS	A data structure is a group of data which can be processed as a single unit. This group of data may be of similar or dissimilar data types. Data Structures are very useful while programming because they allow processing of the entire group of data as a single unit.																					
3	Name the two types of data structures and give a difference between them.	2																				
ANS	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Linear</td> <td style="padding: 2px;">Non – Linear</td> </tr> <tr> <td style="padding: 2px;">The elements are stored in a sequential order.</td> <td style="padding: 2px;">no sequential order is followed</td> </tr> <tr> <td style="padding: 2px;">Array,Stack,Queue</td> <td style="padding: 2px;">Graph,TREE, linked lists</td> </tr> </table>	Linear	Non – Linear	The elements are stored in a sequential order.	no sequential order is followed	Array,Stack,Queue	Graph,TREE, linked lists															
Linear	Non – Linear																					
The elements are stored in a sequential order.	no sequential order is followed																					
Array,Stack,Queue	Graph,TREE, linked lists																					
4	Expand the following: LIFO, FIFO	2																				
ANS	LIFO: Last-In First-Out FIFO: First-In First-Out																					
5	Define stack.	2																				
ANS	A stack is a data structure that allows adding and removing elements in a particular order. Every time an element is added, it goes on the top of the stack; the only element that can be removed is the element that was at the top of the stack.																					
6	Write all the operations possible in the data structure.	2																				
ANS	The major operations are Traversal, Insertion, Deletion, Searching																					
7	What are the two major Stack operations?	2																				
ANS	1. PUSH: The addition of elements is known as PUSH operation. It is done using the TOP position. 2. POP: Removal of elements is known as POP operation. It is also done using the TOP position.																					
8	Write an algorithm to implement push and POP operation.	2																				
ANS	PUSH 1. Start 2. Initialize top with -1. 3. Input the new element. 4. Increment top by one. 5. stack[top]=new element 6. Print "Item Inserted" 7. Stop	Pop 1. Start 2. If the value of top is -1 go to step 3 else go to step 4 3. Print "Stack Empty" and go to step 7 4. Deleted item = Stack[top] 5. Decrement top by 1 6. print "Item Deleted" 7. Stop																				
9	Give few applications areas of stack.	2																				
ANS	Expression evaluation Backtracking (game playing, finding paths, exhaustive searching). Memory management, run-time environment for nested language features.																					
10	Evaluate the following postfix notation of expression, Show status of stack after every operation. 12,2,7,34,20,-, +,5, +	2																				
ANS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Input Symbol</th> <th style="padding: 2px;">Stack Content</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">12</td> <td style="padding: 2px;">12</td> </tr> <tr> <td style="padding: 2px;">2</td> <td style="padding: 2px;">12,2</td> </tr> <tr> <td style="padding: 2px;">/</td> <td style="padding: 2px;">6</td> </tr> <tr> <td style="padding: 2px;">34</td> <td style="padding: 2px;">6,34</td> </tr> <tr> <td style="padding: 2px;">20</td> <td style="padding: 2px;">6,34,20</td> </tr> <tr> <td style="padding: 2px;">-</td> <td style="padding: 2px;">6,14</td> </tr> <tr> <td style="padding: 2px;">+</td> <td style="padding: 2px;">20</td> </tr> <tr> <td style="padding: 2px;">5</td> <td style="padding: 2px;">20,5</td> </tr> <tr> <td style="padding: 2px;">+</td> <td style="padding: 2px;">25</td> </tr> </tbody> </table>	Input Symbol	Stack Content	12	12	2	12,2	/	6	34	6,34	20	6,34,20	-	6,14	+	20	5	20,5	+	25	
Input Symbol	Stack Content																					
12	12																					
2	12,2																					
/	6																					
34	6,34																					
20	6,34,20																					
-	6,14																					
+	20																					
5	20,5																					
+	25																					

11	Evaluate the following postfix expression. Show the status of stack after execution of each operation separately: 2,13, + , 5, -,6,3,/,5,*,<	2																																								
ANS	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>2</td><td>13</td><td>15</td><td>5</td><td>15</td><td>10</td><td>6</td><td>10</td><td>3</td><td>6</td><td>10</td><td>10</td><td>2</td><td>10</td><td>5</td><td>2</td><td>10</td><td>10</td><td>10</td><td>0</td></tr> <tr><td></td><td></td><td></td><td>+</td><td></td><td>15 - 5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <p>Result 0</p>	2	13	15	5	15	10	6	10	3	6	10	10	2	10	5	2	10	10	10	0				+		15 - 5															
2	13	15	5	15	10	6	10	3	6	10	10	2	10	5	2	10	10	10	0																							
			+		15 - 5																																					
12	Evaluate using stack 10, 3,* , 30, 2,*,-	2																																								
ANS	<p>Result -30</p>																																									
13	Evaluate the following Postfix expression : 20,10,-15,3,/ , +, 5, *	2																																								
ANS	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Symbol</th> <th>Operation</th> <th>Stack</th> <th>Result</th> </tr> </thead> <tbody> <tr><td>20</td><td>Push</td><td>20</td><td></td></tr> <tr><td>10</td><td>Push</td><td>20, 10</td><td></td></tr> <tr><td>-</td><td>Pop (10) Pop (20) Push (20-10) = 10</td><td>10</td><td></td></tr> <tr><td>15</td><td>Push</td><td>10, 15</td><td></td></tr> <tr><td>3</td><td>Push</td><td>10, 15, 3</td><td></td></tr> <tr><td>/</td><td>Pop (3) Pop (15) Push (15/3)=5</td><td>10.5</td><td></td></tr> <tr><td>+</td><td>Pop (5) Pop (10) Push (10+5) = 15</td><td>15</td><td></td></tr> <tr><td>5</td><td>Push</td><td>15,5</td><td></td></tr> <tr><td>*</td><td>Pop (5) Pop (15) Push (15*5) = 75</td><td>75</td><td>75</td></tr> </tbody> </table> <p>Result 75</p>	Symbol	Operation	Stack	Result	20	Push	20		10	Push	20, 10		-	Pop (10) Pop (20) Push (20-10) = 10	10		15	Push	10, 15		3	Push	10, 15, 3		/	Pop (3) Pop (15) Push (15/3)=5	10.5		+	Pop (5) Pop (10) Push (10+5) = 15	15		5	Push	15,5		*	Pop (5) Pop (15) Push (15*5) = 75	75	75	
Symbol	Operation	Stack	Result																																							
20	Push	20																																								
10	Push	20, 10																																								
-	Pop (10) Pop (20) Push (20-10) = 10	10																																								
15	Push	10, 15																																								
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/	Pop (3) Pop (15) Push (15/3)=5	10.5																																								
+	Pop (5) Pop (10) Push (10+5) = 15	15																																								
5	Push	15,5																																								
*	Pop (5) Pop (15) Push (15*5) = 75	75	75																																							
14	Evaluate The Following Postfix Notation Of Expression. Show status of stack after every operation. 12,2, *, 24,20, -, +, 8, -	2																																								
ANS	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Scanned Element</th> <th>Stack Status</th> <th>Expression</th> </tr> </thead> <tbody> <tr><td>12</td><td>1</td><td>-</td></tr> <tr><td>2</td><td>12,</td><td>-</td></tr> <tr><td>*</td><td>12, 2, *</td><td>24</td></tr> <tr><td>24</td><td>24, 24</td><td>24</td></tr> <tr><td>20</td><td>24, 24, 20</td><td>24</td></tr> <tr><td>-</td><td>24, 24, 20 -</td><td>4</td></tr> <tr><td>+</td><td>24, 4 +</td><td>4</td></tr> <tr><td>8</td><td>28, 8</td><td>4</td></tr> <tr><td>-</td><td>28, 8, -</td><td>20</td></tr> <tr><td>Nill</td><td>20</td><td>20</td></tr> </tbody> </table> <p>Result 20</p>	Scanned Element	Stack Status	Expression	12	1	-	2	12,	-	*	12, 2, *	24	24	24, 24	24	20	24, 24, 20	24	-	24, 24, 20 -	4	+	24, 4 +	4	8	28, 8	4	-	28, 8, -	20	Nill	20	20								
Scanned Element	Stack Status	Expression																																								
12	1	-																																								
2	12,	-																																								
*	12, 2, *	24																																								
24	24, 24	24																																								
20	24, 24, 20	24																																								
-	24, 24, 20 -	4																																								
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Nill	20	20																																								

TOPIC: Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

Q. NO	QUESTIONS WITH ANSWER	MARKS
1	<p>BCCI has created a dictionary containing top players and their runs as key value pairs of cricket team. Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none"> Push the keys (name of the players) of the dictionary into a stack, where the corresponding value (runs) is greater than 49. Pop and display the content of the stack. <p>For example: If the sample content of the dictionary is as follows: SCORE={"KAPIL":40, "SACHIN":55, "SAURAV":80, "RAHUL":35, "YUVRAJ":110, } The output from the program should be: SACHIN SAURAV YUVRAJ OR Vikram has a list containing 10 integers. You need to help him create a program with separate user defined functions to perform the following operations based on this list.</p> <ul style="list-style-type: none"> Traverse the content of the list and push the ODD numbers into a stack. Pop and display the content of the stack. <p>For Example: If the sample Content of the list is as follows: N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38] Sample Output of the code should be: 13,21,89,35</p>	3
ANS	<pre> SCORE={"KAPIL":40, "SACHIN":55, "SAURAV":80, "RAHUL":35, "YUVRAJ":110, } def PUSH(S,R): S.append(R) def POP(S): if S==[]: return None else: return S.pop() ST=[] for k in SCORE: if SCORE[k]>49: PUSH(ST,k) while True: if ST==[]: print(POP(ST),end=" ") else: break </pre> <pre> N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38] def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in N: if k%2!=0: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>	
2	<p>YASH MOTORS have a dictionary of top performer EMPLOYEES and their SALES of as key value pairs of COMPANY. Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none"> Push the keys (name of the EMPLOYEE) of the dictionary into a stack, where the corresponding value (SALES) is greater than 500000. Pop and display the content of the stack. <p>For example: If the sample content of the dictionary is as follows: SALES={"SUNIL":700000, "ROHIT":400000, "RAJEEV":350000, "MAYANK":750000, "RAHUL":1000000, } The output from the program should be: SUNIL MAYANK RAHUL OR Saroj have a list of 10 numbers . You need to help him create a program with separate user defined functions to perform the following operations based on this list.</p>	3

- Traverse the content of the list and push the numbers into a stack which are divisible by 5.
 - Pop and display the content of the stack.
- For Example:
- If the sample Content of the list is as follows:
 $N=[2,5,10,13,20,23,45,56,60,78]$
- Sample Output of the code should be:
 5,10,20,45,60

ANS	<pre> SALES={"SUNIL":700000, "ROHIT":400000, "RAJEEV":350000, "MAYANK":750000, "RAHUL":1000000, } def PUSH(STK,S): STK.append(S) def POP(STK): if STK==[]: return STK.pop() else: return None ST=[] for k in SALES: if SALES[k]>500000: PUSH(ST,k) while True: if ST==[]: print(POP(ST),end=" ") else: break </pre>	<pre> N= [2,5,10,13,20,23,45,56,60,78] def PUSH(S,N): S.append(N) def POP(S): if S==[]: return S.pop() else: return None ST=[] for k in N: if k%5==0: PUSH(ST,k) while True: if ST==[]: print(POP(ST),end=" ") else: break </pre>
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3	<p>A company having dictionary of various Departments and Number of computers (PC) available as key value pairs. Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none"> • Push the keys (name of the Department) of the dictionary into a stack, where the corresponding value (Number of PC) is 25 or more. • Pop and display the content of the stack. <p>For example:</p> <p>If the sample content of the dictionary is as follows: $SETUP={"HR":10, "QUALITY":25, "SUPPORT":50, "PRODUCTION":20, "SUPPLY":25, }$</p> <p>The output from the program should be: QUALITY SUPPORT SUPPLY OR</p> <p>A programmer wants to prepare a stack from given list of integer elements only for the numbers which are divisible by 3. Help him create a program with a user defined functions to perform the following operations based on this list.</p> <ul style="list-style-type: none"> • Traverse the content of the list and push the numbers into a stack which are divisible by 3. • Pop and display the content of the stack. <p>For Example:</p> <p>If the sample Content of the list is as follows: $N=[3,5,10,13,21,23,45,56,60,78]$</p> <p>Sample Output of the code should be: 3,21,45,60</p>	3
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ANS	<pre> SETUP={"HR":10, "QUALITY":25, "SUPPORT":50, "PRODUCTION":20, "SUPPLY":25, } def PUSH(STK,S): STK.append(S) def POP(STK): if STK==[]: return STK.pop() else: return None </pre>	<pre> N=[3,5,10,13,21,23,45,56,60,78] def PUSH(S,N): S.append(N) def POP(S): if S==[]: return S.pop() else: return None </pre>
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else:
    return None
ST=[]
for k in SETUP:
    if SETUP[k]>=25:
        PUSH(ST,k)
    while True:
        if ST!=[]:
            print(POP(ST),end=" ")
        else:
            break

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ST=[]
for k in N:
    if k%5==0:
        PUSH(ST,k)
while True:
    if ST!=[]:
        print(POP(ST),end=" ")
    else:
        break

```

4	<p>JAVED has created a dictionary containing names and marks as key value pairs of 5 students. Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none"> Push the keys (name of the student) of the dictionary into a stack, where the corresponding value (marks) are more than 79 . Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows: <p>R={"RAKESH":70, "OMESH":50, "VISWAS":70, "ANITA":80, "ANUSHRI":90}</p> <p>The output from the program should be: ANITA ANUSHRI OR Alam has a list containing 10 students marks . You need to help him create a program with separate user defined functions to perform the following operations based on this list.</p> <ul style="list-style-type: none"> Traverse the content of the list and push the numbers higher than 33 into a stack. Pop and display the content of the stack. <p>For Example: If the sample Content of the list is as follows: N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38] Sample Output of the code should be: 34,56,79,98,35,38</p>	3
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ANS	<pre> R={"RAKESH":70, "OMESH":50, "VISWAS":70, "ANITA":80, "ANUSHRI":90} def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in R: if R[k]>=75: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>	<pre> N=[12, 13, 34, 56, 21, 79, 98, 22, 35, 38] def PUSH(S,N): S.append(N) def POP(S): if S!=[]: return S.pop() else: return None ST=[] for k in N: if k>33: PUSH(ST,k) while True: if ST!=[]: print(POP(ST),end=" ") else: break </pre>
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5	<p>Nivedita has started a new year's resolution to read 12 non fiction books by the end of 2022. For this purpose she has bought 20 such books. She stores the data in a dictionary as book_name,rating as key, value pair. Help her out a bit to organize her collection with help of Stack Data Structure.</p> <p>Write a program, with separate user defined functions to perform the following operations:</p> <ul style="list-style-type: none"> Push the keys (book_name) of the dictionary into a stack, where the corresponding value (rating) are more than 8 . 	3
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- Pop and display the content of the stack. For example: If the sample content of the dictionary is as follows:
`B={"AI 2041: Ten Visions for Our Future":7.9, "Beginners: The Transformative Joy of Lifelong Learning":8.5, "Bravey: Chasing Dreams, Befriending Pain, and Other Big Ideas":9, "Chatter: The Voice in Our Head, Why It Matters, and How to Harness It":8.2, "The Code Breaker: Jennifer Doudna, Gene Editing, and the Future of the Human Race":7.5}`
 The output from the program should be:

Beginners: The Transformative Joy of Lifelong Learning,
 Bravey: Chasing Dreams, Befriending Pain, and Other Big Ideas,
 Chatter: The Voice in Our Head, Why It Matters, and How to Harness It
 OR

Raghav has created a vocabulary list. You need to help him create a program with separate user defined functions to perform the following operations based on this list.

- Traverse the content of the list and push the entries having less than 7 characters into a stack.

- Pop and display the content of the stack.

For Example:

If the sample Content of the list is as follows:

`W=['Elucidate', 'Haughty', 'Pacify', 'Quip', 'Rapport', 'Urbane', 'Young', 'Zenith']`

Sample Output of the code should be:

Pacify,Quip,Urbane,Young,Zenith

ANS	<pre>B={"AI 2041":7.9, "Beginners":8.5, "Bravey":9, "Chatter":8.2, "The Code Breaker":7.5} def PUSH(S,N): S.append(N) def POP(S): if S==[]: return S.pop() else: return None BList=[] for i in B: if B[i]>8: PUSH(BList,i) while True: if BList==[]: print(POP(BList),end=" ") else: break</pre>	<pre>W=['Elucidate', 'Haughty', 'Pacify', 'Quip', 'Rapport', 'Urbane', 'Young', 'Zenith'] def PUSH(S,W): S.append(W) def POP(S): if S==[]: return S.pop() else: return None WList=[] for i in W: if len(i)<7: PUSH(WList,i) while True: if WList==[]: print(POP(WList),end=" ") else: break</pre>
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UNIT 2

TOPIC: Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)

Q. NO	QUESTIONS WITH ANSWER	MARKS
1	What is a Computer Network?	1
ANS	A computer network is a set of interconnected computers sharing resources located on or provided by network nodes.	
2	Who is considered as the creator(s) of the Internet?	1
ANS	Vinton Cerf and Bob Kahn	
3	In which year ARPANET was formed	1
ANS	1969	
4	What is the full form of NSFNET?	1
ANS	National Science Foundation Network	
5	Which project is considered as the foundation of the Internet?	1
ANS	ARPANET (Advanced Research Projects Agency NETwork)	
6	Write the name of the first web browser.	1
ANS	World Wide Web created by Tim Berners Lee in 1990 NOTE: He also created HTTP and HTML	

7	Which protocol became the foundation of the Internet?	1
ANS	Transmission Control Protocol/Internet Protocol (TCP/IP)	
8	List any 4 services provided by the Internet.	2
ANS	Email, Instant-Messaging, Sharing of Devices and Directory Sharing etc.	
9	What is the difference between the Internet and the World Wide Web?	2
ANS	The Internet is a means of connecting a computer to any other computer anywhere in the world whereas the World Wide Web is a collection of information which is accessed via the Internet.	
10	What is interspace and how is it different from the Internet?	2
ANS	InterSpace is a client-server software program, allows multiple users to communicate online with real-time audio, video or text chat in dynamic 3D environments. It provides the most advanced form of communication available on the Internet today. InterSpace is a vision of what the Internet will become in the future.	

11	Write the full form of ARPANET.	1
ANS	Advanced Research Projects Agency NETwork.	
12	Write the name of the funding agency of NSFNET.	1
ANS	National Science Foundation, a federal agency of the USA funded NSFNET.	
13	Give an example of WAN (Wide Area Network)	1
ANS	Internet	
14	Write the full form of WWW.	1
ANS	World Wide Web	
15	When was the original ARPANET (Advanced Research Projects Agency NETwork) shut down?	1
ANS	1990	
16	Name the types of networks based on the component roles.	1
ANS	Client-Server Networks and Peer-to-Peer Networks	
17	While transferring data on the internet, the message is divided into small units called as _____	1
ANS	Packets	
18	Give one example of PAN (Personal Area Network)	1
ANS	Computer network formed by connecting a laptop with a mobile phone's hotspot internet. Basically, the network formed by connecting personal devices is called a Personal Area Network.	
19	Give one example of LAN (Local Area Network)	1
ANS	Computer network established in a school building.	
20	Give one example of MAN (Metropolitan Area Network)	1
ANS	Cable TV network in a city.	
21	Name the device responsible for converting the digital signal to continuous (analog) signal for transmission over telephone lines.	1
ANS	Modem	
22	Name the device responsible for forwarding the data packets in a computer network.	1
ANS	Router	
23	Name the device which is required to connect a computer to any network.	1
ANS	NIC(Network Interface Card) also known as the NIU (Network Interface Unit), LAN Card, Ethernet Card, TAP (Terminal Access Point).	
24	What is the name given to the unique address assigned to each NIC?	1
ANS	MAC (Media Access Control) Address also called as the physical address of a device.	
25	Name the types of networks based on their geographical spread.	2
ANS	PAN (Personal Area Network), LAN (Local Area Network), MAN (Metropolitan Area Network) and WAN(Wide Area Network)	
26	Differentiate between WWW (World Wide Web) and the Internet.	2
ANS	WWW, also called as W3 is the collection of interlinked hypertext documents commonly known as web pages accessed via the internet. The internet is a global computer network formed by connecting different small networks.	
27	List different components of a computer network.	2

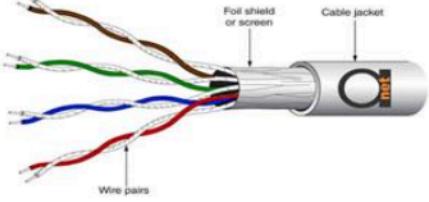
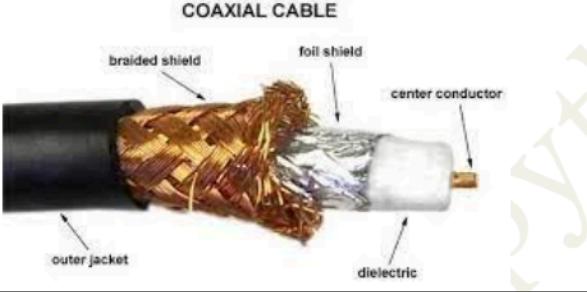
ANS	Following are the components of a computer network - Workstations/Nodes, Network Hardware such as NIC(network interface card), router, switch, hub etc., communication channel(either wired or wireless) and softwares such as network operating system, browsers and protocols.	
28	List any four advantages of computer networks.	2
ANS	Resource Sharing. Cost efficient way of communication. Collaborative user interaction. Time Saving. Provides better and reliable storage solutions.	
29	List any four disadvantages of computer networks.	2
ANS	Security issues may arise if proper security measures are not in place. Productivity may decline due to ill-management of resources shared on the network. In case of centralised data servers, failure of the central server will serve as the single point of failure for bringing down all the services. In large networks, you might need to hire a specialist team to manage the network, increasing the cost of network management. Despite regular updates of antivirus softwares, transmission and spread of malicious softwares and files is quite rampant in those systems which are frequently connected to networks.	
30	What is baud rate?	1
ANS	It is a measure of the speed at which the data is being transferred in a communication channel. The rate indicates the number of electrical oscillations per second that occurs within a data transmission. The higher the baud rate, the more bits per second that are transferred.	
31	Explain the 80:20 rule.	1
ANS	The 80:20 rule states that 80% of the traffic in any network segment should be local and only 20% of the traffic should leave that segment for efficient traffic management. It simply means that we should install the server at the site/building containing the maximum number of computers.	

TOPIC: Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)								
Q. NO	QUESTIONS WITH ANSWER	MARKS						
1	What are the components used in communication?	1						
ANS	Sender, receiver, message, protocol and transmission media							
2	What is a Communication Channel?	1						
ANS	It is a medium through which we can send a message to its intended audience							
3	What do you mean by a Protocol?	1						
ANS	It is a set of rules or procedures for transmitting data between electronic devices.							
4	What is the full form of IP?	1						
ANS	Internet Protocol							
5	How many bits are used in an IPv4 address?	1						
ANS	32 bits							
6	How many bits are used in an IPv6 address?	1						
ANS	128 bits							
7	Which Protocol of TCP/IP uses IP Address?	1						
ANS	Internet Protocol (IP)							
8	What is the Bandwidth of a channel?	2						
ANS	It is the difference between upper and lower frequency limits of the analog signal or the maximum amount of information that the channel can carry.							
9	Differentiate circuit switching and packet switching (mention any 2).	2						
ANS	<table border="1"> <tr> <td>S. N.</td> <td>Circuit Switching</td> <td>Packet Switching</td> </tr> <tr> <td>1</td> <td>Connection-oriented</td> <td>Connectionless</td> </tr> </table>	S. N.	Circuit Switching	Packet Switching	1	Connection-oriented	Connectionless	
S. N.	Circuit Switching	Packet Switching						
1	Connection-oriented	Connectionless						

	2	The bandwidth used is fixed	The bandwidth used is dependent on actual data transmitted	
	3	Reliable as a dedicated communication channel is used	High-volume networks can lose data packets during high-traffic times	
	4	Preferred when the communication is long and continuous	It's beneficial for transferring data that doesn't require real-time responsiveness	
	5	It is expensive to implement	Packet switching is easier and more affordable than circuit switching	
	6	The utilisation of resources is not optimal	The utilisation of resources is optimal as multiple network nodes can use the same channel while transferring their packets	
	7	The link between the sender and the receiver will be maintained even if no transmission of data taking place	The bandwidth will be used by other nodes if transmission is not taking place	
	8	Failure in the links stop transmission	Failure in the links does not stop the delivery of the data as these packets can be routed from other paths as well	
	9	Example, Analog telephone network	Example, newer mobile phone technologies (e.g., GSM, LTE), Ethernet	
10	What is the Data Transfer Rate (DTR)?			2
ANS	It is the ratio of the total amount of digital data transferred between two points in some defined period of time and is measured in Bit Per Second (bps) or Bytes Per Second (Bps)			
11	In which type of switching technique the resources are reserved for the duration of the data transfer process?			1
ANS	Circuit Switching			
12	In which type of switching technique the data is divided into smaller units before transmission?			1
ANS	Packet Switching			
13	List the types of communication media with examples of each.			
ANS	1. Wired Communication Media - Twisted Pair Cable, Coaxial Cable, Optical Fibre Cable 2. Wireless Communication Media - Microwave, Radio Waves, Infrared, Satellite Communication			2
14	Which of the following wireless communication media is/are omnidirectional: Microwaves, Radio waves, Infrared waves?			1
ANS	Radio waves			
15	What is an IP (logical) address?			1
ANS	An IP address is a unique address assigned to each device connected to a computer network.			
16	Give an example of an IPv4 address.			1
ANS	An IPv4 address is a 32-bit address expressed in decimal notation as x.x.x.x where each x is an integer between 0 and 255. Example: 192.0.2.188			
17	Which of the following communication media require(s) line-of-sight for communication? Microwave, Radio waves, Infrared			1
ANS	Microwaves, Infrared			
18	Which of the following communication media can penetrate solid objects? Microwave, Radio waves, Infrared			1
ANS	Radio waves			

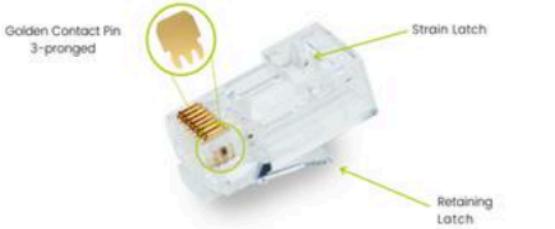
TOPIC: Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves)

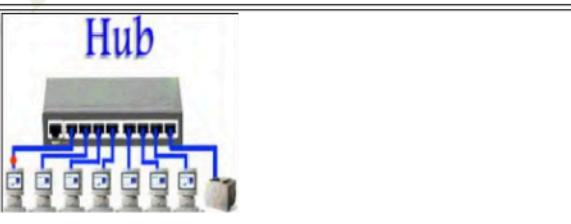
Q. NO	QUESTIONS WITH ANSWER	MARKS
1	What is transmission media?	1

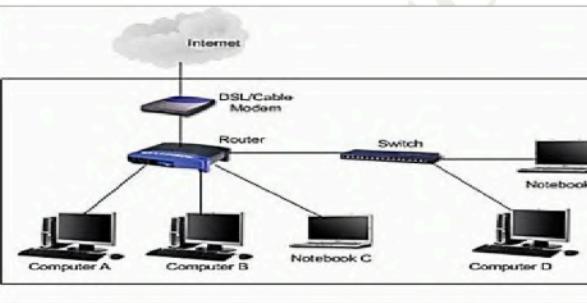
ANS	Transmission media is a communication channel that carries the information from the sender to the receiver and vice versa.			
2	Write name of guided and unguided media.	1		
ANS	Guided Media : Twisted pair, coaxial cable , Fiber Optic Cable Unguided Media : Radio waves, Micro waves, Infrared waves			
3	In the _____ cables, the cables are twisted together in pairs of two wires wrapped together in helix form.	1		
ANS	Twisted Pair : Twisted Pair Cables are further of two types : 	<p>1. Unshielded Twisted Pair Cables (UTP) : These are a pair of two insulated copper wires twisted together without any other insulation or shielding and hence are called unshielded twisted pair cables. These cables are cost-effective and easy to install ,used for short-distance transmission and less costly.</p> <p>2. Shielded Twisted Pair Cables (STP) : These types of cables have extra insulation or protective covering over the conductors in the form of a copper braid covering. They are generally used for long-distance communication ,preventing external electromagnetic noise penetration and higher bandwidth as compared to UTP.</p>		
4	_____ cable consists of a solid wire core surrounded by one or more foil or wire shields.	1		
ANS	Coaxial 	Coaxial cable is useful for both analog and digital data transmission. It has a higher bandwidth and is relatively less expensive compared to fiber optic cable.		
5	Compare optical fiber and co-axial transmission media.	1		
ANS	S.NO	Optical Fiber	Coaxial Cable	
	1.	Optical Fiber is used to transmit the signal/data is in light form.	Coaxial Cable is used to transmit the signal/data is in electrical form.	
	2.	The cost of optical fiber is high.	The cost of coaxial cable is less.	
	3.	Installation and implementation of optical fiber is difficult.	Installation and implementation of coaxial cable is easy.	
	4.	These cables are not affected due to external magnetic field.	Coaxial cables are less affected by the external magnetic field.	
	5.	Its maximum transmission speed is up to 10 Gbps.	Its maximum transmission speed is up to 10 Mbps.	
6	Which guided/wired transmission media is fastest and expensive?	1		
ANS	Fiber optics			
7	Why fiber optic transmission media is faster as compared to other wired transmission media?			
ANS	Fiber optic transmits data as light, while other wired media transfer data as electricity. Light travels exponentially faster than electricity so fiber optic transmission media is faster.			
8	Out of the following, which is the fastest wired medium of Transmission medium Telephone Cable , Twisted Pair Cable , Optical Fibre Cable	1		
ANS	Optical Fibre Cable			
9	Out of the following, identified the unguided communication media ? Infrared, Coaxial Cable, Optical Fibre, Microwave, Radio waves	1		

ANS	Infrared, Microwave, Radio waves	
10	Write the two characteristics of Wi-fi	1
ANS	Convenient and anywhere technology. Support Secure wireless communication	
11	For difficult terrain , which unguided media would you suggest ?	1
ANS	Microwave and Radio Wave	
12	Arrange the following communication media in the ascending order of their transmission speed. Twisted Pair Cable ,Telephone Cable , Optical Fibre Cable	1
ANS	Telephone Cable , Twisted Pair Cable , Optical Fibre Cable	
13	Write the one advantage and one disadvantage of Optical fibre cable	1
ANS	Advantage- Its high speed guided media . Disadvantage- It is an expensive communication media	
15	Rearrange the following terms in increasing order of data transfer rates Gbps ,Mbps, Tbps, Kbps,Bps	1
ANS	Bps, Kbps, Mbps, Gbps, Tbps	

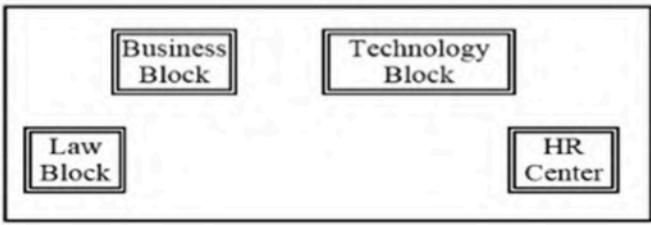
TOPIC:Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)																				
Q. NO	QUESTIONS WITH ANSWER	MARKS																		
1	What is a network device? Give some examples of network devices.	2																		
ANS	Hardware devices that are used to connect computers, printers, fax machines and other electronic devices to a network are called network devices. E.g. Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card.																			
2	When the computer network uses telephone lines as a communication channel then MODEM is used as a data communication device. Explain the working of a modem?	2																		
ANS	Basically, our computer generates data in the form of digital signals, which need to be forwarded to the receiver through telephone lines. Since, telephone lines can carry only analog signals. So, digital signals need to be converted to analog signals at the sender's site, this is called modulation. At the receiver's site, again analog signals are converted back to the digital signals, then this is called demodulation.																			
3	What is Ethernet card? How Ethernet Differs from Wi-Fi Card?	2																		
ANS	An Ethernet card is a kind of network adapter. These adapters support the ethernet standard for high-speed network connections via cables.																			
	<table border="1"> <tr> <td></td><td>Wi-Fi Card</td><td>Ethernet Card</td></tr> <tr> <td>Speed</td><td>Slow data transfer speed</td><td>Faster data transfer speed</td></tr> <tr> <td>Reliability</td><td>Suffers from signal interference due to many environmental factors</td><td>Delivers a consistent speed</td></tr> <tr> <td>Security</td><td>Data flow needs to be encrypted</td><td>Data doesn't require to be encrypted</td></tr> <tr> <td>Latency</td><td>Higher</td><td>Lower</td></tr> <tr> <td>Deployment</td><td>Easy to install and deploy</td><td>Cable installation infrastructure is required</td></tr> </table>		Wi-Fi Card	Ethernet Card	Speed	Slow data transfer speed	Faster data transfer speed	Reliability	Suffers from signal interference due to many environmental factors	Delivers a consistent speed	Security	Data flow needs to be encrypted	Data doesn't require to be encrypted	Latency	Higher	Lower	Deployment	Easy to install and deploy	Cable installation infrastructure is required	
	Wi-Fi Card	Ethernet Card																		
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Latency	Higher	Lower																		
Deployment	Easy to install and deploy	Cable installation infrastructure is required																		
4	What is RJ45 connector? where it is used?	2																		

ANS	RJ45 stands for Registered Jack-45. It is an eight wire connector. RJ45 connector is used to connect computers onto a Ethernet cable/Local Area Network (LAN).		
5	Define repeaters with its two types.		2
ANS	Repeaters are used to amplify the signals, when they are transported over a long distance. Repeaters are of two types (i) Amplifier It amplifies or boosts the incoming signals. So, it amplifies both the signal and any concurrent noise. (ii) Signal repeater It only amplifies the signal and filters out the noise signals. So, we get only the clear signal at the receiver end. Repeaters may be included after every 100 mtrs (approx) distance.		
6	Expand the following i. MODEM ii. RJ45		2
ANS	i. MODEM - MOdulator DEModulator ii. RJ45 - Registered Jack-45		
7	Mention the appropriate networking device for following conditions. (i) It is a hardware device which is used to amplify the signals when they are transported over a long distance. (ii) It is a device that converts digital signal to analog signal and vice versa		2
ANS	i. Repeater ii. MODEM		
8	Write full form of WiFi.		1
ANS	WiFi - Wireless Fidelity		

9	What is Hub?		2
ANS	Network device that contains multiple ports. It is used to connect several computers together. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets.		
10	How are active hubs different from passive hubs?		2
ANS	Active Hub Active Hubs electrically amplify the signal as it moves from one connected device to another Active hubs are used like repeater to extend the length of a network Transmission rate is high	Passive Hub Passive Hubs does not amplify the signals Passive hubs can not be used as a repeater Transmission rate is slow	
11	What is a Switch?		2
ANS	- A switch is called a smart hub. Provides multiple connections - A device that filters and forwards packets between LAN segments. - Switch passes the frame to a specific port because it keeps a record of MAC address		
12	Differentiate hub and switch ?		2
ANS	HUB Hub passes the frame to every port. Slow Speed	SWITCH Passes the frame to a specific port, because it keeps a record of MAC address. High Speed	

	Hub shares its bandwidth with each and every port, so bandwidth divided among all the nodes, which will degrade performance.	Switch allocates full bandwidth to each of its ports. So users always access the maximum amount of bandwidth.	
13	What is Gateway ?		2
ANS	A gateway is a network point that acts as an entrance to another network. It is used to connect two dissimilar networks		
14	What is a Bridge ?		2
ANS	A device that connects two local-area networks (LANs), or two segments of the same LAN that use the same protocol, such as Ethernet.		
15	What is the Router ?		2
ANS	A router is a device that forwards data packets along networks. A router is connected to at least two networks, commonly two LANs or WANs. Routers are located at gateways, the places where two or more networks connect. A router acts as a dispatcher, choosing the best path for information to travel so it's received quickly.		
16	Which of the following (i) is not a broadcast device (ii) offers a dedicated bandwidth ? (a) Repeater (b) Bridge (c) Hub (d) Switch		2
ANS	(i) Bridge is not a broadcast device as it filters traffic depend upon the receivers MAC address (ii) Switch Offer dedicated bandwidth		
17	What out of the following, will you use to have an audio visual chat with an expert sitting in a faraway place to fix-up a technical issue (i) Email (ii) VoIP (iii) FTP		2
ANS	(ii) VoIP		

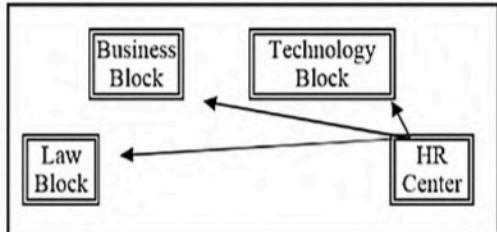
TOPIC: Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)

Q. NO	QUESTIONS WITH ANSWER	MARKS																			
1	TPU University is setting up its academic blocks at Udaipur and is planning to set up a network. The University has 3 academic blocks and one Human Resource Centre as shown in the diagram below:  Center to Center distances between various blocks/center is as follows: <table border="1"><tr><td>Law Block to Business Block</td><td>40m</td><td>No of computers in various blocks/center is as follows:</td></tr><tr><td>Law Block to Technology Block</td><td>80m</td><td>Law Block</td><td>15</td></tr><tr><td>Law Block to HR Centre</td><td>105m</td><td>Technology Block</td><td>40</td></tr><tr><td>Business Block to HR Centre</td><td>30m</td><td>HR Centre</td><td>115</td></tr><tr><td>Technology Block to HR Centre</td><td>15m</td><td>Business Block</td><td>25</td></tr></table>	Law Block to Business Block	40m	No of computers in various blocks/center is as follows:	Law Block to Technology Block	80m	Law Block	15	Law Block to HR Centre	105m	Technology Block	40	Business Block to HR Centre	30m	HR Centre	115	Technology Block to HR Centre	15m	Business Block	25	4
Law Block to Business Block	40m	No of computers in various blocks/center is as follows:																			
Law Block to Technology Block	80m	Law Block	15																		
Law Block to HR Centre	105m	Technology Block	40																		
Business Block to HR Centre	30m	HR Centre	115																		
Technology Block to HR Centre	15m	Business Block	25																		

- a) Suggest an ideal layout for connecting these blocks/centers for wired connectivity.
 b) Which device will you suggest to be placed/installed in each of these blocks/centers to efficiently connect all the computers within these blocks/centers.
 c) Suggest the placement of a Repeater in the network with justification.
 d) The university is planning to connect its admission office in Delhi, which is more than 780 km from the university. Which type of network out of LAN, MAN, or WAN will be formed? Justify your answer

ANS

a.



- b. Hub / Switch
 c. Repeater may be placed when the distance between 2 buildings is more than 100 meters.
 d. WAN, as the given distance is more than the range of LAN and MAN.

2

ABC Corp. has set up its Branch at Srinagar for its office and web-based activities. It has 4 Zones of buildings as shown in the diagram:



Branch to Branch Distance is:

Zone X to Zone Z	40m
Zone Z to Zone Y	60m
Zone Y to Zone X	135m
Zone Y to Zone U	70m
Zone X to Zone U	165m
Zone Z to Zone U	80m

Number of Computers :

Zone X	50
Zone Z	130
Zone Y	40
Zone U	15

- (i) Suggest the most suitable place (i.e., Zone) to house the ERP and BI Server of this organisation with a suitable reason.
 (ii) Which device will you suggest to be placed/installed in each of these ZONES to efficiently connect all the computers within these blocks/centres.
 (iii) Suggest the placement of a Repeater in the network with justification.
 (iv) Which is the most economic type of internet connection cable for the selected topology?

ANS

- (a) The most suitable place (i.e., Zone) to house the ERP and BI Server is Zone Z as it has the most number of computers; thus, cabling cost will be reduced and most traffic will be local.
 (b) Hub / Switch
 (c) Repeaters may be placed when the distance between 2 buildings is more than 100 meters.
 (d) An economic type of internet connection cable is Dial-up or broadband

3

ABC Software Development Company has set up its new center at Jaipur for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below:



Center to center distances between various blocks

Block A to Block B	50 m
Block B to Block C	150 m

Number of Computers

Block A	25
Block B	50

Block C to Block D	25 m		Block C	125	
Block A to Block D	170 m		Block D	10	
Block B to Block D	125 m				
Block A to Block C	90 m				

- a. Suggest the most suitable place (Block) to install the Server of the Company.
- b. Suggest an ideal layout for connecting these blocks for a wired connectivity.
- c. Suggest the place of repeater in the network with justification.
- d. Which device will you suggest to be installed in each of these blocks to efficiently connect all the computers within these blocks.
- e. The company is planning to connect its administrative Office in Delhi which is more than 1200 km from the Company. Which type of network out of LAN, MAN or WAN will be formed? Justify your answer.

ANS a. Block C maximum number of computers

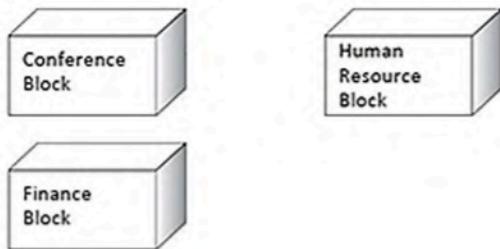
b. Any layout either Bus or Star

c. Suggest the place of repeater in the network with justification.

d. Place of repeater where distance is more than 80m

e. WAN

4 XYZ CONSULTANTS is a professional consultancy company. The company is planning to set up new offices in India with its hub at Gurugram. As a network adviser, you have to understand their requirements and suggest to them the best available solutions.



Block-to-Block distance (in Mtrs.):

Block (From)	Block (To)	Distance
Human Resources	Conference	60
Human Resources	Finance	60
Conference	Finance	120

Expected Number of Computers to be installed in each block:

Block	Computers
Human Resources	125
Conference	25
Finance	60

(a) What will be the most appropriate block where an organization should plan to install their server?

(b) Draw a block-to-block cable layout to connect all the buildings in the most appropriate manner for efficient communication.

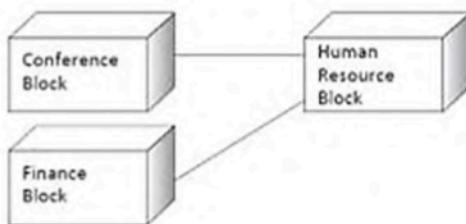
(c) What will be the best possible connectivity out of the following to connect the new set-up of offices in Dehradun with its London base office?

(i) Infrared (ii) Satellite Link (iii) Ethernet Cable

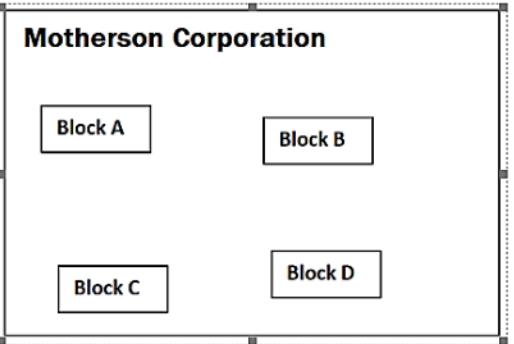
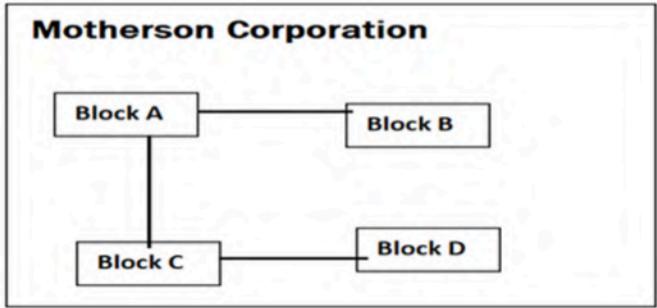
(d) Which of the following devices will you suggest to connect each computer in each of the above buildings?

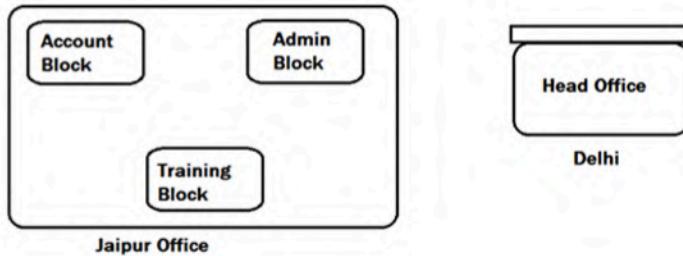
(i) Gateway (ii) Switch (iii) Modem

ANS a) Human Resource
b)



c) (ii) Satellite Link

	(d) (ii) Switch	
5	Motherson Corporation has set up its new centre at Jaipur, Rajasthan for its office and web-based activities. It has 4 blocks of buildings.	
		
	<p>Distance between the various blocks is as follows:</p> <p>A to B - 50 m B to C - 110m C to D - 90m A to D - 160m B to D - 140m A to C - 80m</p>	<p>Numbers of computers in each block</p> <p>Block A - 25 Block B - 50 Block C - 125 Block D - 10</p>
ANS	<p>(a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Jaipur centre for connecting the digital devices.</p> <p>(b) Suggest the placement of the following device with justification</p> <ol style="list-style-type: none"> Repeater Hub/Switch <p>(c) Which kind of network (PAN/LAN/WAN) will be formed if the Jaipur office is connected to its head office in Mumbai?</p> <p>(d) Which fast and very effective wireless transmission medium should preferably be used to connect the head office at Mumbai with the centre at Jaipur.</p>	<p>(a)</p> 
6	<p>Unicorp Tech Training Ltd. is a Delhi based organization which is expanding its office set-up to Jaipur. At Jaipur office , they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in a network for communication, data and resource sharing.</p> <p>As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in (i) to (iv), as per the distances between various blocks/locations and other given parameters.</p>	



Shortest distances between various blocks/locations :

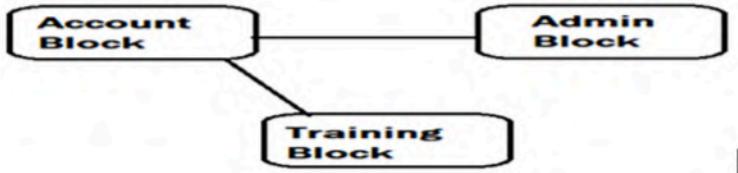
Admin Block to Accounts Block	310 Metres
Accounts Block to Training Block	160 Metres
Admin Block to Training Block	190 Metres
Delhi Head Office to Jaipur Office	700 Km

Number of computers installed at various blocks are as follows :

Training Block	130
Accounts Block	40
Admin Block	50

- (i) Suggest the most appropriate block/location to house the SERVER in the JAIPUR office (out of the 3blocks) to get the best and effective connectivity. Justify your answer.
- (ii) Suggest the best wired medium and draw the cable layout (Block to Block) to efficiently connect various blocks within the JAIPUR office compound.
- (iii) Suggest a device/software and its placement that would provide data security for the entire network of the JAIPUR office.
- (iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone/laptop users in the JAIPUR office.

- ANS
- (i) Training Block – Because it has maximum number of computers.
 - (ii) Best wired medium: Optical Fibre OR CAT5 OR CAT6 OR CAT7 OR CAT8 OR Ethernet Cable

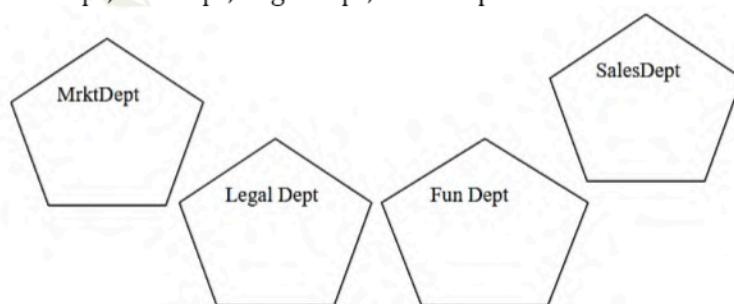


- (iii) Firewall – Placed with the server at the Training Block
OR

Any other valid device/software name

- (iv) Device Name: WiFi Router OR WiMax OR RF Router OR Wireless Modem OR RF Transmitter Protocol: WAP OR 802.16 OR TCP/IP OR VOIP OR MACP OR 802.11

- 7 Sun Pvt. Ltd. is setting up the network in the Udaipur. There are four departments named as MrktDept, FunDept, LegalDept, SalesDept.

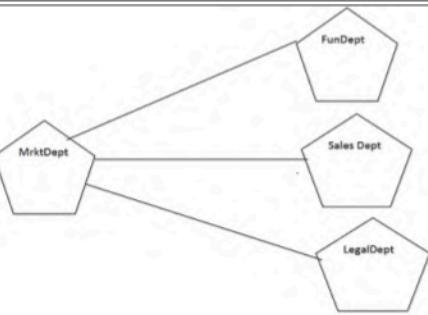
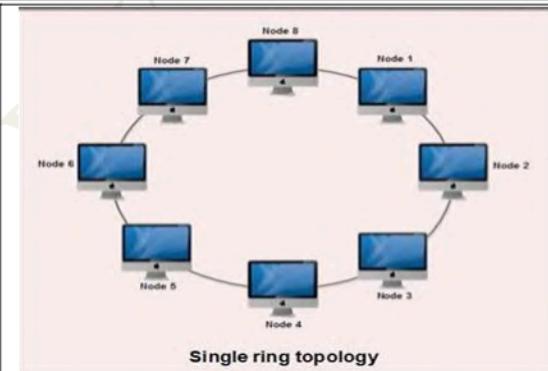


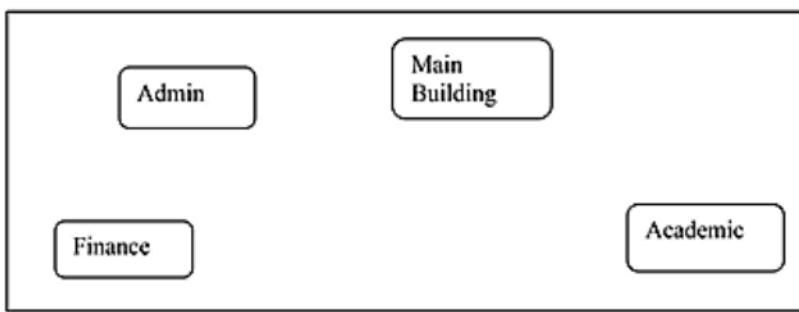
Distance between various buildings is given as follows:

MrktDept to FunDept	90 m
MrktDept to LegalDept	170m
MrktDept to SalesDept	110 m
LegalDept to SalesDept	140 m
LegalDept to FunDept	110 m

Number of Computers in the buildings:

MrktDept	30
LegalDept	10
FunDept	08
SalesDept	52

	FunDept to SalesDept 60 m												
<p>i) Suggest a cable layout of connections between the Departments and specify topology. ii) Suggest the most suitable building to place the server with a suitable reason. iii) Suggest the placement of i) modem ii) Hub /Switch in the network. iv) The organization is planning to link its sale counter situated in various part of the same city/ which type of network out of LAN,WAN, MAN will be formed? Justify.</p>													
ANS	 i)	<p>ii) SalesDept because it has maximum no. of computers. iii) Each building should have hub/switch and Modem in case Internet connection is required. iv) MAN (Metropolitan Area Network)</p>											
8	Write the various advantages and disadvantages of Bus topology ?		2										
ANS	<table border="1"> <thead> <tr> <th>Advantages</th> <th>Disadvantages</th> </tr> </thead> <tbody> <tr> <td>1. Easy to install and the use for small networks.</td> <td>1. If the main cable fails the entire network collapses.</td> </tr> <tr> <td>2. Requires less cable</td> <td>2. Difficult to troubleshoot</td> </tr> <tr> <td>3. Failure of one node does not affect the network functioning.</td> <td>3. Slow, due to traffic on single cable</td> </tr> <tr> <td>4. New node can be easily added</td> <td>4. Only one device transmits at a time, other devices wait for their turn</td> </tr> </tbody> </table>		Advantages	Disadvantages	1. Easy to install and the use for small networks.	1. If the main cable fails the entire network collapses.	2. Requires less cable	2. Difficult to troubleshoot	3. Failure of one node does not affect the network functioning.	3. Slow, due to traffic on single cable	4. New node can be easily added	4. Only one device transmits at a time, other devices wait for their turn	
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4. New node can be easily added	4. Only one device transmits at a time, other devices wait for their turn												
9	Define Star Topology ?		2										
	<p>The physical star Topology uses a central controlling hub with dedicated legs pointing in all directions – like points of a star. Each network device has a dedicated point-to-point link to the central hub. There is no direct link between these computers and the computers can communicate via central controller only.</p>  <p style="text-align: center;">Star topology</p>												
10	Define Ring Topology ?		2										
	 <p style="text-align: center;">Single ring topology</p>	<p>The physical ring Topology is a circular loop of point-to- point links. Messages travel around the ring from node to node in a very organised manner. Each workstation checks the message for a matching destination address. If the address doesn't match, the node simply regenerates the message and sends it on its way. If the address matches, the node accepts the message and sends a reply to the originating sender.</p>											
11	<p>Aakar University of Madhya Pradesh is setting up a secured network for its campus at Himachal Pradesh for operating their day-to-day office & web based activities. They are planning to have network connectivity between four buildings. Answer the question (i) to (iv) after going through the building positions in the campus & other details which are given below:</p>		4										



The distances between various buildings of university are given as:-

Building 1	Building 2	Distance(in mtrs.)
Main	Admin	50
Main	Finance	100
Main	Academic	70
Admin	Finance	50
Finance	Academic	70
Admin	Academic	60

Number of Computers:

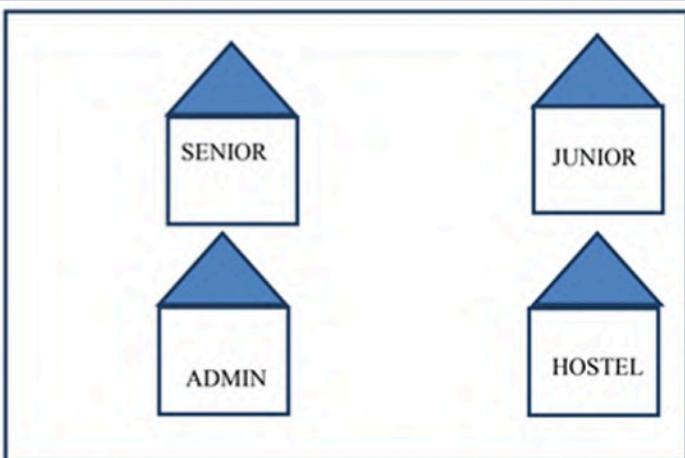
Building	No. of Computers
Main	150
Admin	75
Finance	50
Academic	60

As a network expert, you are required to give the best possible solutions for the given queries of the university administration:-

- (a) Suggest cable layout for the connections between the various buildings,
- (b) Suggest the most suitable building to house the server of the network of the university,
- (c) Suggest the placement of following devices with justification:

- 1. Switch/Hub
 - 2. Repeater
 - (d) Suggest the communication media out of the following for setting-up very fast Internet connectivity among buildings of the university
1. Optical Fibre
2. Coaxial cable
3. Ethernet Cable

ANS	<p>(a) Star topology</p> <p>(b) Server should be placed at the Main Building as it has the maximum number of computers.</p> <p>(c) Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building</p> <p>A repeater needs to be placed along the wire between main building & finance building as the distance between them is more than 70 mtr.</p> <p>(d) Optical Fibre</p>	4
12	Kendriya Vidyalaya Jawahar Nagar is setting up the network between its Different Wings of school campus. There are 4 wings named as SENIOR(S), JUNIOR(J), ADMIN(A) and HOSTEL(H).	4



Distance between various wings are given below:

Wing A to Wing S	100m
Wing A to Wing J	200m
Wing A to Wing H	400m
Wing S to Wing J	300m
Wing S to Wing H	100m
Wing J to Wing H	450m

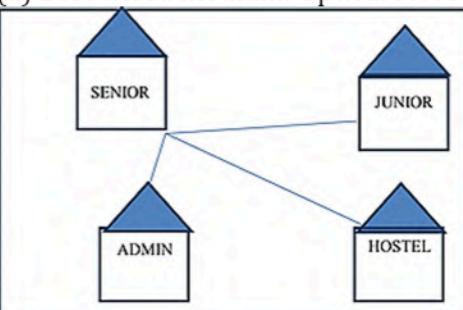
Number of Computers installed at various wings are as follows:

Wings	Number of Computers
Wing A	20
Wing S	150
Wing J	50
Wing H	25

(a) Suggest the best wired medium and draw the cable layout to efficiently connect various wings of Kendriya Vidyalaya Jawahar Nagar.

- (b) Name the most suitable wing where the Server should be installed. Justify your answer.
- (c) Suggest a device and its placement that should be used to connect with the Internet provided by BSNL Telephone Network.
- (d) Which transmission media will be used to connect the campus with Regional Office to attend the conferences.

ANS (a) Best wired medium: Optical Fibre OR CAT5 OR CAT6 OR CAT7 OR CAT8 OR Ethernet Cable



(b) Senior Wing(S) - Because it has a maximum number of computers.

(c) Modem - Placed with the server at Senior Wing (S)

(d) Transmission media : Optical Fibre/High Speed Broadband

13 Jonathan and Jonathan Training Institute is planning to set up its centre in Amritsar with four specialised blocks for Medicine, Management, Law courses along with an Admission block in separate buildings. The physical distances between these blocks and the number of computers to be installed in these blocks are given below. You as a network expert have to answer the queries raised by their board of directors as given in (i) to (iv).

Shortest distances between various locations in metres:

Admin Block to Management Block	60
Admin Block to Medicine Block	40
Admin Block to Law Block	60
Management Block to Medicine Block	50
Management Block to Law Block	110
Law Block to Medicine Block	40

Number of Computers installed at various locations are as follows:

Admin Block	150
Management Block	70
Medicine Block	20
Law Block	50

- (i). Suggest the most suitable location to install the main server of this institution to get efficient connectivity.

(ii). Suggest by drawing the best cable layout for effective network connectivity of the blocks having server with all the other blocks.

(iii). Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:

- Modem
- Switch
- Gateway
- Router

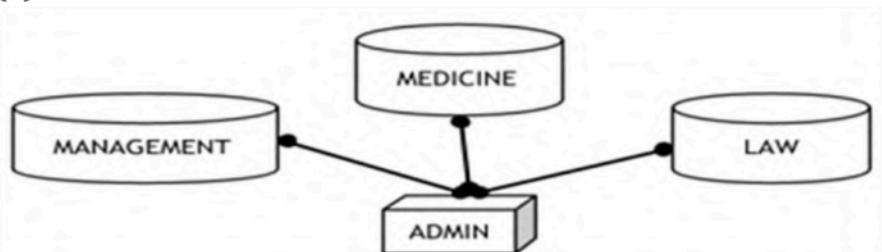
(iv) Suggest the most suitable wired medium for efficiently connecting each computer installed in every building out of the following network cables:

- Coaxial Cable
- Ethernet Cable
- Single Pair
- Telephone Cable

ANS

(i) Admin Block as maximum number of computers

(ii)



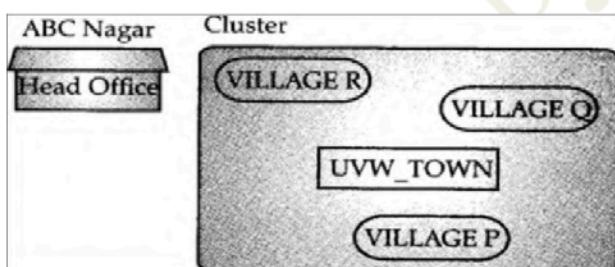
(iii) Modem or Switch or Router

(iv) Ethernet Cable

14

India Skills Hub is a skill development community which has an aim to promote the standard of skills in the society. It is planning to set up its training centres in multiple towns and villages Pan India with its head offices in the nearest cities. They have created a model of their network with a city ABC Nagar, a town (UVW town) and 3 villages.

As a network consultant, you have to suggest the best network related solutions for their issues/problems raised in (i) to (iv), keeping in mind the distances between various locations and other given parameters.



Shortest distances between various locations :

VILLAGE P TO UVW_TOWN	1.5 KM
VILLAGE Q TO UVW_TOWN	2.0 KM
VILLAGE R TO UVW_TOWN	1.0 KM
VILLAGE P TO VILLAGE Q	2.5 KM
VILLAGE P TO VILLAGE R	4.0 KM
VILLAGE Q TO VILLAGE R	2.3 KM
ABC Nagar Head Office to Cluster	28 KM

Number of computers installed at various locations are as follow :

UVW_TOWN	150
VILLAGE P	10
VILLAGE Q	15
VILLAGE R	20
ABC Nagar Head Office	5

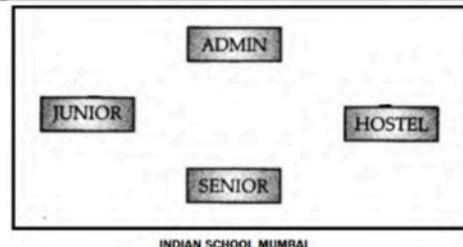
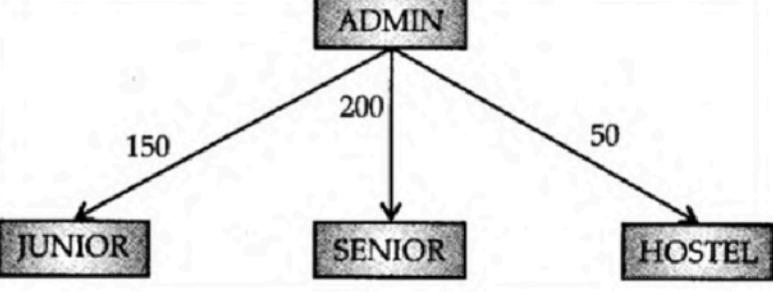
Note:

In Villagers, there are community centres, in which one room has been given as a training centre to this organisation to install computers. The organisation has got financial support from the government and top Multinational Organisations.

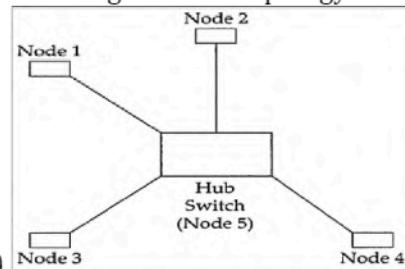
(i) Suggest the most appropriate location of the SERVER in the Cluster (out of the 4 locations), to get the best and effective connectivity. Justify your answer.

(ii) Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the Cluster.

(iii) Which hardware device will you suggest to connect all the computers with in each location

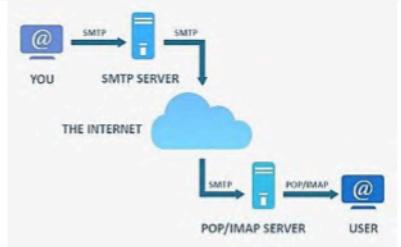
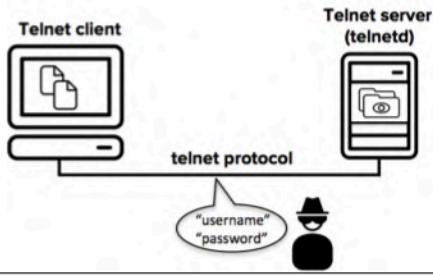
	(iv) Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at all locations of Cluster?													
ANS	(i) YTOWN Justification-(1) Since it has the maximum number of computers.(2) It is closest to all other locations (ii) Optical Fibre for fast and effective communications (iii) Switch or Hub to connect several computers together (iv) Video conferencing or VoIP or any other correct service/protocol.													
15	Indian School, in Mumbai is starting up the network between its different wings. There are four Buildings named as SENIOR, JUNIOR, ADMIN and HOSTEL as shown below:	4												
	 <table border="1"> <thead> <tr> <th>Building</th> <th>Number of Computers</th> </tr> </thead> <tbody> <tr> <td>SENIOR</td> <td>130</td> </tr> <tr> <td>JUNIOR</td> <td>80</td> </tr> <tr> <td>ADMIN</td> <td>160</td> </tr> <tr> <td>HOSTEL</td> <td>50</td> </tr> </tbody> </table>	Building	Number of Computers	SENIOR	130	JUNIOR	80	ADMIN	160	HOSTEL	50			
Building	Number of Computers													
SENIOR	130													
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HOSTEL	50													
	<p>The distance between various buildings is as follows:</p> <table> <tbody> <tr> <td>ADMIN TO JUNIOR</td> <td>150m</td> <td>SENIOR TO ADMIN</td> <td>200m</td> </tr> <tr> <td>HOSTEL TO ADMIN</td> <td>50m</td> <td>HOSTEL TO JUNIOR</td> <td>210m</td> </tr> <tr> <td>SENIOR TO JUNIOR</td> <td>220m</td> <td>SENIOR TO HOSTEL</td> <td>205m</td> </tr> </tbody> </table> <p>(i) Suggest the suitable cable layout of connections between the buildings. Also give the name of topology (ii) Suggest the most suitable place (i.e., building) to house the server of this school with a suitable reason. (iii) Suggest the placement of the following devices with justification. (a) Repeater (b) Hub/Switch (iv) The organisation also has an inquiry office in another city about 50-60 km away in hilly region. Suggest the suitable transmission media to interconnect to school and inquiry office out of the following : (a) Fibre optic cable (b) Microwave (c) Radiowave Also give the type of this network</p>	ADMIN TO JUNIOR	150m	SENIOR TO ADMIN	200m	HOSTEL TO ADMIN	50m	HOSTEL TO JUNIOR	210m	SENIOR TO JUNIOR	220m	SENIOR TO HOSTEL	205m	
ADMIN TO JUNIOR	150m	SENIOR TO ADMIN	200m											
HOSTEL TO ADMIN	50m	HOSTEL TO JUNIOR	210m											
SENIOR TO JUNIOR	220m	SENIOR TO HOSTEL	205m											
ANS	<p>1. Star topology as shortest cable length (total 400 Metres required)</p>  <p>2. Server can be placed in the ADMIN building as it has the maximum number of computers. 3. Repeaters can be placed between ADMIN and SENIOR buildings as well as ADMIN and JUNIOR buildings as the distance is more than 110 m. 4. Radio waves can be used in hilly regions as they can travel through obstacles. Type of Network is WAN (Wide Area Network)</p>													
16	<p>Identify the type of topology from the following ?:</p> <p>(i) Each node is connected with the help of a single cable (ii) Each node is connected with the help of independent cable with central switching.</p>	2												
ANS	<p>(i) Bus Topology (ii) Star Topology</p>													
17	Mahesh wants to transfer data within a city at very high speed. Write the wired transmission medium and type of network ?.	2												
ANS	Wired communication media is Optical Fibre Cable and type of network is MAN (Metropolitan Area Network)													
18	Write one advantage of the bus topology of the network ?. Also illustrate how four (4) computers can be connected with each other using the bus topology of the network.	2												

ANS		<p>Advantage (benefits) of linear Bus topology is that the cable length required for this topology is the least compared to the other networks.</p> <p>Bus Topology Network</p>					
19	<p>(i) Which type of network (out of LAN, PAN and MAN) is formed when you connect two mobiles using Bluetooth to transfer a video?</p> <p>(ii) Which type of network frame when we connect with our relative in a foreign country?</p>		2				
Ans	<p>(i) PAN (Personal Area Network)</p> <p>(ii) WAN (Wide Area Network)</p>						
20	Define the term Topology.		2				
ANS	<p>The term Topology refers to the way/layout in which the various nodes or computers of a network are linked together.</p> <p>In other words , the pattern of arrangement of computers in a network is called Topology.</p>						
21	Write the name of various types of topologies.		2				
ANS	<pre> graph TD Topology[Topology] --- Bus[Bus] Topology --- Ring[Ring] Topology --- Star[Star] Topology --- Mesh[Mesh] Topology --- Tree[Tree] Topology --- Hybrid[Hybrid] </pre>						
22	Write the name of various factors , which are considered while selecting a topology.		2				
ANS	<p>The following factors are considered while selecting a topology:</p> <ol style="list-style-type: none"> 1. Cost 2. Reliability 3. Scalability 4. Bandwidth capacity 5. Ease of installation 6. Ease of troubleshooting 7. Delay involved in routing information from one node to another. 						
23	Define Bus Topology.		2				
	<p>It consists of one continuous length of cable (trunk) that is shared by all the nodes in the network and a terminating resistor (terminator) at each end that absorbs the signal when it reaches the end of line. Without a terminator the electrical signal would reach the end of copper wire and bounce back, causing errors on the network.</p> <p>Data communication message travels along the bus in both directions until it is picked up by a workstation or server NIC.</p> <p>If the message is missed or not recognized, it reaches the end of the cabling and dissipates at the terminator.</p> <p>Bus Network Topology requires a multipoint connection.</p>						
24	Write various advantages and disadvantages of Star Topology		2				
ANS	<table border="1"> <thead> <tr> <th><u>Advantages</u></th> <th><u>Disadvantages</u></th> </tr> </thead> <tbody> <tr> <td> 1.Easier to add new nodes or modify any existing node without disturbing the network. 2. Fast Speed 3. If any local computer or link fails, the entire system does not collapse 4. Easy fault detection and isolation 5. Central node control </td> <td> 1.Central node dependency. If the central controller or hub fails, the entire system collapses. 2. Cabling cost is more 3. Difficult to install </td> </tr> </tbody> </table>	<u>Advantages</u>	<u>Disadvantages</u>	1.Easier to add new nodes or modify any existing node without disturbing the network. 2. Fast Speed 3. If any local computer or link fails, the entire system does not collapse 4. Easy fault detection and isolation 5. Central node control	1.Central node dependency. If the central controller or hub fails, the entire system collapses. 2. Cabling cost is more 3. Difficult to install		
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1.Easier to add new nodes or modify any existing node without disturbing the network. 2. Fast Speed 3. If any local computer or link fails, the entire system does not collapse 4. Easy fault detection and isolation 5. Central node control	1.Central node dependency. If the central controller or hub fails, the entire system collapses. 2. Cabling cost is more 3. Difficult to install						
25	Write various advantages and disadvantages of Ring Topology		2				

ANS	<p><u>Advantages</u></p> <ol style="list-style-type: none"> 1. Easy to troubleshoot 2. There is no master computer on the controller. 3. There are no collisions. 4. Fast speed <p>Easy fault detection and isolation</p>	<p><u>Disadvantages</u></p> <ol style="list-style-type: none"> 1. Requires more cable 2. More Expensive 3. A break in cable ring brings down entire network 4. Data flows in single direction 	
26	Write one advantage of the star topology network. Also, illustrate how five (5) computers can be connected to each other using the star topology of the network.		2
ANS	<p>(i) Advantage of Star Topology: Essay to install and controlled by Central Node .</p>  <p>(ii)</p>		

TOPIC: Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP

Q. N.	QUESTIONS WITH ANSWER	MARKS				
1	Which is the most recent version of HTTP protocol?	1				
ANS	HTTP/2 (originally named HTTP/2.0)					
2	HTTP (HyperText Transfer Protocol) is a _____ Protocol. (Connection Oriented /Connectionless)	1				
ANS	Connectionless (also called stateless)					
3	Explain HTTP message.	2				
ANS	<p>HTTP Message is request-response data which is exchanged between the client and the server (client-server architecture).</p> <p>An HTTP client is a program that establishes a connection to a server to send one or more HTTP request messages and an HTTP server is a program that accepts connections to serve HTTP requests by sending an HTTP response message.</p> 					
4	You want to open the KVS HQ website on a web-browser, which Protocol do you need to access the same?	1				
ANS	HTTP (HyperText Transfer Protocol)					
5	Who developed the FTP protocol?	1				
ANS	Abhay Bhushan (Alumni IIT Kanpur) at MIT					
6	Which protocol is generally used to upload web pages to a web server for hosting?	1				
ANS	FTP (File Transfer Protocol)					
7	Differentiate anonymous and non-anonymous FTP.	2				
ANS	<table border="1"> <tr> <td>Anonymous FTP</td> <td>Non anonymous FTP</td> </tr> <tr> <td>users are given access to a distributed file where they do not need to sign in with a specific username and password</td> <td>users need to log in with a specific username and password to gain access to a certain file.</td> </tr> </table>	Anonymous FTP	Non anonymous FTP	users are given access to a distributed file where they do not need to sign in with a specific username and password	users need to log in with a specific username and password to gain access to a certain file.	
Anonymous FTP	Non anonymous FTP					
users are given access to a distributed file where they do not need to sign in with a specific username and password	users need to log in with a specific username and password to gain access to a certain file.					
8	Explain Point to Point Protocol (PPP) protocol.	2				
ANS	It is Windows' default Remote Access Service (RAS) protocol and mainly used to encapsulate data to pass through synchronous and asynchronous lines of communication over serial point-to-point connections. It is also known as RFC 1661.					

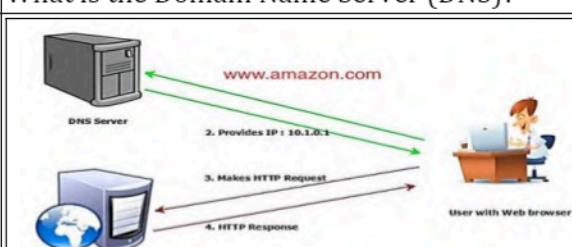
9	List the two sub-protocol of PPP.	1
ANS	Link Control Protocol (LCP) and Network Control Protocol (NCP).	
10	A Manager of an IT company sends an email to one of his colleagues, requesting him to prepare the balance sheet. Which network protocol is involved during this email communication?	1
ANS	Simple Mail Transfer Protocol (SMTP) 	
11	Explain the two models of SMTP Protocols.	1
ANS	The end-to-end model is used to communicate between different organisations . The store and forward model is used within an organisation.	
12	What is the Post Office Protocol v3 (POP3)?	1
ANS		It is used to retrieve emails from a remote mail server to a local email client which can be read later even when the system is offline. This protocol also removes the mail copy from the mail server once downloaded locally.
13	What is the telnet Protocol?	2
ANS		It is used to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection on the Internet or local area network. Once a telnet client establishes a connection to the remote host, the client becomes a virtual terminal, allowing the host to communicate with the remote host.
14	Explain Voice over Internet Protocol (VoIP)	2
ANS	It is a technology that allows us to make voice calls using an Internet connection instead of a regular (or analog) phone line by converting voice into a digital signal that travels over the Internet.	
15	What is the use of TCP/IP Protocol?	2
ANS	It is a suite of communication protocols used to interconnect network devices on the internet. The entire TCP and IP suite is commonly referred to as TCP/IP in which TCP and IP are the two main protocols, though others are included.	
16	Write the full form of HTTP, FTP.	1
ANS	HTTP - HyperText Transfer Protocol	FTP - File Transfer Protocol
17	Write the full form of PPP, SMTP.	1
ANS	PPP - Point to Point Protocol	SMTP - Simple Mail Transfer Protocol
18	Write the full form of TCP/IP, POP3.	1
ANS	TCP/IP - Transmission Control Protocol/Internet Protocol	POP3 - Post Office Protocol Version 3
19	Write the full form of HTTPS, VoIP.	1
ANS	HTTPS - HyperText Transfer Protocol Secure	VoIP - Voice Over Internet Protocol
20	Write the full form of XML and HTML.	1
ANS	XML - Extensible Markup Language	HTML - HyperText Markup Language
21	Write the full form of WLL and IMAP.	1
ANS	WLL - Wireless local loop	IMAP - Internet Message Access Protocol
22	Write the full form of CDMA and GSM.	1

ANS	CDMA - Code Division Multiple Access	GSM - Global System for Mobile Communication	
23	Write the full form of LTE and GPRS.		1
ANS	LTE - Long Term Evolution	GPRS - General Packet Radio Service	
24	Name the softwares that uses the TELNET protocol?		1
ANS	TELNET, AnyDesk, Team Viewer		
25	What type of content can be transferred using the HTTP protocol?		1
ANS	Text, images, audio, video and other multimedia files can be transferred over the web using the HTTP protocol		
26	Distinguish between HTTP and FTP protocol. (any two)		2
ANS	HTTP	FTP	
	It stands for HyperText Transfer Protocol	It stands for File Transfer Protocol	
	It is a set of rules that define how web pages are transferred between computers over the internet	It is a set of rules that govern the uploading and downloading of files over the internet	
	It uses the Transmission Control Protocol and runs on TCP port 80	It uses the Transmission Control Protocol and runs on TCP port 20(for commands) and 21 (for data)	
	It is efficient in transferring small files	It is efficient in transferring large files	
	It is a stateless (Connectionless) protocol	It is a stateful(connection-oriented) protocol	
	It is faster as compared to FTP	It is slower as compared to HTTP	
27	Distinguish between POP3 and SMTP protocols. (any two)		2
ANS	POP3	SMTP	
	It stands for Post Office Protocol Version 3	It stands for Simple Mail Transfer Protocol	
	It is used for viewing messages	It is used for sending messages	
	It is also called POP protocol	It is also called PUSH protocol	
	It is implied between the receiver and receiver mail server	It is implied between sender mail server and receiver mail server	
	It retrieves the mail from the mailbox at the receiver's mail server to the receiver's computer	It transfers mail from the sender's computer to the mailbox present at the receiver's mail server	
	It is a MAA (Message Access Agent) for accessing messages from the mail server	It is a MTA (Message Transfer Agent) for sending messages to the receiver	
	It uses TCP port 110	It uses TCP port 25	
28	Distinguish between IMAP and POP3 protocols. (any two)		2
ANS	IMAP	POP3	
	It stands for Internet Message Access Protocol	It stands for Post Office Protocol Version 3	
	It uses TCP port 143	It uses TCP port 110	
	It is an advanced protocol that allows the user to view all the folders on the mail server	It is a simple protocol that allows downloading of mail from your mailbox at the mail server to your local computer	
	The mail can be accessed on multiple devices	In POP3, mail can be accessed only on one device at a time	
	It is slower as compared to POP3	It is faster as compared to IMAP	
	The mail content can be partially read before downloading	To read the email, it must be downloaded on the local computer	
29	Explain the working of the HTTP protocol in brief.		2
ANS	HyperText Transfer Protocol is a stateless protocol which works on the request-response model i.e. it gives the users a way to interact with the resources such as HTML files by transmitting hypertext messages between clients and servers. HTTP clients generally use TCP (Transmission Control Protocol) connections to communicate with the servers.		
30	Explain the difference between HTTP and HTTPS. (any two)		2
ANS	HTTP	HTTPS	
	Lacks Security	Uses SSL certificates to protect the data being communicated	

	<table border="1"> <tr> <td>Uses port no. 80 by default</td><td>Uses port no. 443 by default</td></tr> <tr> <td>The data is not encrypted before sending</td><td>Data is encrypted before transmission</td></tr> <tr> <td>HTTP works on the Application layer</td><td>HTTPS works on the Transport Layer</td></tr> <tr> <td>Since no encryption is performed, this is faster</td><td>The data is encrypted before transmission, hence this is slower</td></tr> </table>	Uses port no. 80 by default	Uses port no. 443 by default	The data is not encrypted before sending	Data is encrypted before transmission	HTTP works on the Application layer	HTTPS works on the Transport Layer	Since no encryption is performed, this is faster	The data is encrypted before transmission, hence this is slower	
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Since no encryption is performed, this is faster	The data is encrypted before transmission, hence this is slower									
31	Explain the 3-way handshake process of TCP protocol.	2								
ANS	TCP protocol uses three-way handshake in which the sender first sends the RTS (Request to send) frame After receipt of RTS, the receiver sends the CTS (Clear to send) frame On receipt of CTS, the sender again sends the ACK (Acknowledgement) which signifies the successful receipt of the CTS frame.									
32	Which out of the following is/are connection-oriented protocol(s)? TCP, IP, HTTP	1								
ANS	TCP (Transmission Control Protocol)									
33	Which out of the following is/are connectionless (or stateless) protocol(s)? TCP, IP, HTTP	1								
ANS	IP(Internet Protocol), HTTP (HyperText Transfer Control Protocol)									
34	Write the port numbers used by the following protocols: HTTP, FTP, SMTP, POP3, HTTPS, TELNET, VoIP	1								
ANS	HTTP - Port No. 80 SMTP - Port No. 25 HTTPS - Port No. 443 VoIP -Port No. 5060	FTP - Port No. 20 for commands and Port no. 21 for data POP3 - Port No. 110 TELNET - Port No. 23	(Half Mark for each correct port no.)							
35	Ram wants to have a meeting with his team-mates where they can see each other and discuss the new project they have been assigned by the management. Which protocol would be used in this communication?	1								
ANS	H.323 and session initiation protocol (SIP)									
36	Tejas wants to download all his emails on his ipad and read them whenever he is free. Which protocol would be used?	1								
ANS	POP3									
37	Rani needs to download all the study material regarding her favourite subject from a remote server. Which protocol would she use?	1								
ANS	FTP (File Transfer Protocol)									
38	Aman works for an IT company which provides custom-application softwares. One of his clients does not know how to install one such software on his computer. Which protocol would Aman use to assist the client for remote installation of a particular application software?	1								
ANS	TELNET (for remote access)									
39	Write the name of the protocol used when- You send an email to another user	1 You read your email								
ANS	SMTP (Simple Mail transfer protocol)	POP3 (Post Office Protocol Version 3)								
40	Dev wants to search for information about esteemed engineering colleges in India. He opens his web browser and types the phrase "Best engineering colleges in India" into the Google Search box. He gets a list of search results in his web browser. Which protocol was used in this task?	1								
ANS	HTTPS (HyperText Transfer Protocol Secure)									

TOPIC: Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

Q. NO	QUESTIONS WITH ANSWER	MARKS
1	What is a web service?	1
ANS	A web service is a set of open protocols and standards that allow data to be exchanged between different applications or systems. A client invokes a web service by submitting an XML request, which the service responds with an XML response.	
2	What is the World Wide Web?	1

ANS	The World Wide Web, commonly known as the Web, is an information system where documents and other web resources are identified by Uniform Resource Locators, which may be interlinked by hyperlinks, and are accessible over the Internet.																						
3	What is a Cookie?	1																					
ANS	Cookies are text files with small pieces of data like a username and password that are used to identify your computer as you use a computer network.																						
4	What is HTML? Explain its tags.	2																					
ANS	The HyperText Markup Language, or HTML is the standard markup language that is used to structure a web page and its content. HTML tags are like keywords which define how a web browser will format and display the content. These contain three main parts; opening tag, content and closing tag but some HTML tags are unclosed tags. Example, <html>, <p>, <h1> etc.																						
5	What is the Domain Name Server (DNS)?	1																					
ANS	 <p>Domain Name Server, translates human readable domain names (for example, www.amazon.com) to its corresponding machine readable IP addresses (for example, 192.0.2.44).</p>																						
6	What is a website?	1																					
ANS	It is a set of related web pages located under a single domain name, typically produced by a single person or an organisation.																						
7	How is a website different from a web-service? Mention any 2 differences.	2																					
ANS	<table border="1"> <thead> <tr> <th>S. N.</th> <th>Web Service</th> <th>Website</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Doesn't have a user interface</td> <td>Has a user interface (GUI)</td> </tr> <tr> <td>2</td> <td>Consumed by any application (like web, native, windows etc.) and require programming knowledge</td> <td>Consumed by end user and doesn't require programming knowledge</td> </tr> <tr> <td>3</td> <td>Platform independent as they use open protocols</td> <td>Cross-platform as they require tweaking to operate on different browsers, operating systems, etc.</td> </tr> <tr> <td>4</td> <td>Web services are accessed by HTTP methods</td> <td>Websites are accessed by using their GUI components – buttons, text boxes, forms, etc.</td> </tr> <tr> <td>5</td> <td>Typically returns XML or JSON files, something that is easily decoded by a programmer</td> <td>Typically returns HTML pages, images, media files etc.</td> </tr> <tr> <td>6</td> <td>Example, Google maps API is a web service that can be used by websites to display Maps by passing coordinates to it.</td> <td>Example, https://kvsangathan.nic.in/ is a website that has a collection of related web pages</td> </tr> </tbody> </table>	S. N.	Web Service	Website	1	Doesn't have a user interface	Has a user interface (GUI)	2	Consumed by any application (like web, native, windows etc.) and require programming knowledge	Consumed by end user and doesn't require programming knowledge	3	Platform independent as they use open protocols	Cross-platform as they require tweaking to operate on different browsers, operating systems, etc.	4	Web services are accessed by HTTP methods	Websites are accessed by using their GUI components – buttons, text boxes, forms, etc.	5	Typically returns XML or JSON files, something that is easily decoded by a programmer	Typically returns HTML pages, images, media files etc.	6	Example, Google maps API is a web service that can be used by websites to display Maps by passing coordinates to it.	Example, https://kvsangathan.nic.in/ is a website that has a collection of related web pages	
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8	What is a Web Page and also explain the concept of Index web-page?	2																					
ANS	A web-page is a hypertext document provided by a website and displayed to a user in a web browser. Index page is the first page of a website that contains links to other parts of the website																						
9	What is Web Hosting? List any two Web Hosts Service providers.	2																					
ANS	Web hosting is an online service that allows customers to publish their website onto the internet. Web host is responsible for making sure that the website is up and running 24x7. It is also a host's job to prevent any security breaches and store all website related files, assets and databases onto the server. Example, IBM, Amazon Web Services (AWS), Bluehost, HostGator and Hostinger etc.																						
10	Write any 2 differences between Web Pages and Website.	2																					
	<table border="1"> <thead> <tr> <th>S. N.</th> <th>Web Page</th> <th>Website</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>It is a single document that is displayed by the web browser using a specific URL address that includes contents like text, media, etc. It also comprises links to many other relevant webpages.</td> <td>It is a collection of many documents. Web browsers are used to access such documents using specific URL addresses attached to the website.</td> </tr> </tbody> </table>	S. N.	Web Page	Website	1	It is a single document that is displayed by the web browser using a specific URL address that includes contents like text, media, etc. It also comprises links to many other relevant webpages.	It is a collection of many documents. Web browsers are used to access such documents using specific URL addresses attached to the website.																
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2	It usually contains content regarding a single entity type.	It usually contains content regarding several entities.	
3	It can be accessed using a direct URL link or through a website.	It can be accessed through a domain address.	
4	The web page URL includes the extension, i.e., the path of the file.	The website URL does not include any extension.	
5	It is comparatively less-complex to develop because it is just a smaller part of the website.	It is comparatively more complex to develop.	
6	The web page address of any specific website directly depends on the website address (domain). This means, if the domain is down, the webpage will not work.	Website address (domain) is independent of the webpage address. In case the webpage is deleted due to any reason, the website will continue to work. All other linked web pages will also work as usual.	
7	Contact Page, Registration Page, Sign Up Page, About Page, or any other page like this.	Amazon.com, Wikipedia.org, KVS HQ, etc.	
11	What is the difference between WWW and W3C?		2
ANS	The World Wide Web Consortium (W3C) is the main international standards organisation which develops standards and protocols/guidelines to ensure long-term growth for the World Wide Web; Led by Web inventor and Director Tim Berners-Lee and CEO Jeffrey Jaffe. The World Wide Web, also called the Web, is an information space where documents and other web resources are identified by Uniform Resource Locator, interlinked by hypertext links, and accessible via the Internet.		
12	Write the full form of URL		1
ANS	Uniform Resource Locator		
13	Identify the following from the URL : https://www.sample.com/cs_books.html Type of protocol being used Name of the server on the Internet Domain Indicator Name of the resource being accessed		2
ANS	HTTPS Server Name - www.sample.com Domain Indicator - com Name of resource being accessed - cs_books.html		
14	Give examples of Web browsers. (any two)		1
ANS	Google Chrome, Mozilla Firefox, Safari, Microsoft Internet Explorer, Microsoft Edge, Opera etc.		
15	What is a web server?		1
ANS	It is a computer that serves web pages as and when they are requested by clients.		
16	What is the difference between HTML and XML?(any two)		2
ANS	XML New tags can be created It is case sensitive Ordering of tags matters (nesting of tags must be in correct order) It focuses on structure of data Matching opening tags and closing tags must be there	HTML Tags are pre-fixed, new tags cannot be created It is case insensitive Ordering of tags is immaterial It focuses on presentation of data Closing tags are optional	
17	Give examples of web servers. (Any two)		1
ANS	Apache HTTP Server, Microsoft IIS (Internet Information Services) Server, Apache Tomcat, NGINX		
18	Give examples of DNS servers. (Any two)		1
ANS	Google, Quad9, OpenDNS, Cloudflare, Alternate DNS		
19	Give examples of search engines.		1
ANS	Google, Bing, Yahoo, DuckDuckGo		

UNIT 3

TOPIC: Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table,

Q. No	Questions with answer	Marks												
1	Define DDL & DML commands of SQL with example.	2												
ANS	<p>DDL: - Data Definition Language (DDL) provides commands for defining relation schemas, deleting relations, creating indexes, and modifying relation schemas. For example: CREATE, ALTER, DROP etc...</p> <p>DML: - Data Manipulation Language (DML) includes commands for manipulating tuples in databases. For example: Insert, Delete, Update commands etc...</p>													
2	Name two legal sublanguage of SQL (Structured Query Language)?	2												
ANS	DDL (Data Definition Language), DML (Data Manipulation Language).													
3	A table TEACHER has attributes CODE, NAME, POST, CATEGORY. Write down the command to delete the attribute CATEGORY from this table.	1												
ANS	ALTER TABLE Teacher DROP Category;													
4	Consider the following SQL statement. S1: CREATE TABLE employee (eno CHAR(3), name VARCHAR(20)); S2: INSERT INTO employee VALUES ('E01','RAHUL DRAVID'); From S1 and S2, which one is DDL and which one is DML?	2												
ANS	S1: DDL S2: DML													
5	In SQL, write the query to display the list of tables stored in a database.	1												
ANS	SHOW TABLES													
6	In SQL, what is the use of the IS NULL operator?	1												
ANS	To check if the column has null value/no value/blank													
7	In SQL, name the clause that is used to display the tuples in ascending/ descending order of an attribute.	1												
ANS	ORDER BY													
8	A table ACCOUNTS in the database has 14 columns and 4 records. What is its degree if 2 more rows are added into the table?	1												
ANS	14													
9	<p>Write the queries to Create a database named as 'Company' and then Create a Table with use of NOT NULL and Primary Key constraints for following relation definition:</p> <p>Staff (StaffID, FirstName, LastName, IsQualified) where</p> <table border="1"> <tr> <td>StaffID</td> <td>Char type data with length 5</td> <td>PRIMARY KEY</td> </tr> <tr> <td>FirstName</td> <td>varchar type data with length 20</td> <td>NOT NULL</td> </tr> <tr> <td>LastName</td> <td>varchar type data with length 15</td> <td></td> </tr> <tr> <td>IsQualified</td> <td>Char type data with length 4</td> <td></td> </tr> </table>	StaffID	Char type data with length 5	PRIMARY KEY	FirstName	varchar type data with length 20	NOT NULL	LastName	varchar type data with length 15		IsQualified	Char type data with length 4		3
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FirstName	varchar type data with length 20	NOT NULL												
LastName	varchar type data with length 15													
IsQualified	Char type data with length 4													
ANS	CREATE DATABASE COMPANY; CREATE TABLE Staff (StaffID CHAR (5) PRIMARY KEY, FirstName VARCHAR (20) NOT NULL, LastName VARCHAR (15), IsQualified CHAR(4)));													
10	Write a SQL statement to create a table named Country including columns country_id, country_name and region_id and make sure that no duplicate data against column country_id will be allowed at the time of insertion.	3												
	Attribute Data type Constraint													

	<table border="1"> <tr> <td>Name</td><td></td><td></td></tr> <tr> <td>country_id</td><td>char data type of length 4</td><td>Should not be empty and should be unique</td></tr> <tr> <td>country_name</td><td>variable length character type with a length of 40</td><td>Should not be empty</td></tr> <tr> <td>region_id</td><td>decimal with length of 10 with a precision of 0</td><td>Should not be empty</td></tr> </table>	Name			country_id	char data type of length 4	Should not be empty and should be unique	country_name	variable length character type with a length of 40	Should not be empty	region_id	decimal with length of 10 with a precision of 0	Should not be empty							
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Write a query to describe the structure of this table after creation?																				
ANS	<pre>CREATE TABLE Country (COUNTRY_ID char(4) NOT NULL, COUNTRY_NAME varchar(40) NOT NULL, REGION_ID decimal(10,0) NOT NULL, UNIQUE (COUNTRY_ID)); Desc Country; Or Describe Country;</pre>																			
11	<p>Write a Query to Create a database named as "COMPANY" and after creating write a query to open it?</p> <p>Write a SQL statement to create a table named Job under this database company, the table includes columns JOB_ID, JOB_TITLE, MIN_SAL and MAX_SAL, BONUS and make sure that the job_id column should be primary key and job_title should not be empty.</p> <table border="1"> <thead> <tr> <th>FIELD NAME</th><th>DATA TYPE</th><th>REMARKS</th></tr> </thead> <tbody> <tr> <td>JOB_ID</td><td>VARCHAR(10)</td><td>PRIMARY KEY</td></tr> <tr> <td>JOB_TITLE</td><td>VARCHAR(35)</td><td>NOT EMPTY</td></tr> <tr> <td>MIN_SAL</td><td>INTEGER</td><td></td></tr> <tr> <td>MAX_SAL</td><td>INTEGER</td><td></td></tr> <tr> <td>BONUS</td><td>INTEGER</td><td></td></tr> </tbody> </table>	FIELD NAME	DATA TYPE	REMARKS	JOB_ID	VARCHAR(10)	PRIMARY KEY	JOB_TITLE	VARCHAR(35)	NOT EMPTY	MIN_SAL	INTEGER		MAX_SAL	INTEGER		BONUS	INTEGER		3
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ANS	<pre>CREATE DATABASE COMPANY; USE COMPANY; CREATE TABLE JOB (JOB_ID varchar(10) PRIMARY KEY, JOB_TITLE varchar(35) NOT NULL, MIN_SAL int , MAX_SAL int, BONUS int);</pre>																			
12	Which SQL command is used to display existing databases.	1																		
ANS	SHOW DATABASES;																			
13	An organisation named PRIDE wants to put all the data in the form of records. The records are stored in a table and tables are stored in a database. Which DDL command is used to create a database name PRIDE.	1																		
ANS	CREATE DATABASE PRIDE;																			
14	How to use an existing database name PRIDE ? Give an example.	1																		
ANS	USE PRIDE;																			
15	What is the difference between CHAR and VARCHAR in SQL?	1																		
ANS	VARCHAR is variable length, while CHAR is fixed length																			
16	How to delete the whole database named Student_Data?	1																		
ANS	DROP DATABASE Student_Data;																			
17	How to see the existing table structure in the database?	1																		
ANS	DESCRIBE table_name; OR DESC table_name;																			

	We use DESCRIBE or DESC (both are the same) command to describe the structure of a table.																									
18	<p>...</p> <p>Name1 VARCHAR(20) Name2 CHAR(20),</p> <p>...</p> <p>If Name1 stores value as 'Ram' and Name2 stores value as 'Rama', then Name1 will consume _____ characters" space and Name2 will consume _____ characters' space.</p>	1																								
ANS	3, 20																									
19	What is the maximum value that can be stored in NUMERIC(6,2) ?	1																								
ANS	9999.99																									
20	What should be the data type for the column <i>Rate</i> storing values less than Rs. 1000, e.g., 400.40 ?	1																								
ANS	NUMBER(5,2)																									
21	What should be the data type for the column <i>IFSC_Code</i> storing alphanumeric bank code having 11 characters, e.g. SBIN0066200 ?	2																								
ANS	CHAR(11)																									
22	What should be the data type for the column <i>PINCode</i> storing 6-digit numeric PIN code for any address in India, e.g. 324100 ? Also, it should be calculation-proof.	1																								
ANS	NUMBER(6)																									
23	What should be the data type for the column <i>DOB</i> , e.g., 30/06/2002 What format does the SQL follow to store the DOB?	2																								
ANS	DATE 'YYYY-MM-DD'																									
24	What do you understand by Degree and Cardinality of a table ? Give a suitable example.	2																								
ANS	<p>Degree - Number of columns or attributes or fields in a table are called table's degree.</p> <p>Cardinality - Number of rows/tuples/records in a table are called table's cardinality.</p> <p>Example:</p>																									
	TABLE - EMPLOYEE																									
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	Its degree is 4 (4 columns) and cardinality is 5 (5 rows)																									
25	Give a suitable example of a table with sample data and illustrate Primary ,Candidate and Alternate Keys in it. (any two keys)	2																								
ANS	<p>Primary Key. It is the set of one or more attributes that can uniquely identify tuples within a relation.</p> <p>Candidate Key. A candidate key is the one that is capable of becoming the primary key.</p> <p>Alternate Key. It is a candidate key which is not the primary key.</p> <p>Example :</p>																									
	TABLE - STUDENT																									
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26	Consider the following table structure and suggest which attribute will form the primary key? Student (Rollno, Name, Grade, Marks)	1																								
ANS	Rollno																									
27	Observe the following table and answer the parts(i) and(ii) accordingly	2																								

	<p>TABLE - PRODUCT</p> <table border="1"> <thead> <tr> <th>P_No</th><th>P_Name</th><th>Qty</th><th>PurchaeDate</th></tr> </thead> <tbody> <tr> <td>201</td><td>Pencil</td><td>105</td><td>10/02/2015</td></tr> <tr> <td>102</td><td>Eraser</td><td>101</td><td>01/01/2015</td></tr> <tr> <td>203</td><td>Pen</td><td>85</td><td>04/03/2015</td></tr> <tr> <td>204</td><td>Clips</td><td>88</td><td>03/12/2014</td></tr> <tr> <td>105</td><td>Sharpener</td><td>72</td><td>11/11/2014</td></tr> </tbody> </table> <p>(i) Write the names of most appropriate columns, which can be considered as candidate keys. (ii) What is the degree and cardinality of the above table?</p>	P_No	P_Name	Qty	PurchaeDate	201	Pencil	105	10/02/2015	102	Eraser	101	01/01/2015	203	Pen	85	04/03/2015	204	Clips	88	03/12/2014	105	Sharpener	72	11/11/2014																																										
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28	Consider the following tables FACULTY and COURSES and answer the parts(i) and (ii) accordingly.	2																																																																	
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ANS	Degree : 5 and Cardinality: 6 In the TRAINER table TID is suitable to make a Primary Key and in COURSES table CID is suitable																																																																		

	<p>to make a Primary Key, both Primary Keys are used to find out the unique rows in the table.</p> <p>OR</p> <p>Alternate Key: TNAME here has two candidate keys (TID and TNAME), so one becomes a Primary Key (TID) than the rest of TNAME is Alternate Key.</p> <p>TID is the Foreign Key in COURSES table and it is related to Primary Key TID of TRAINER table.</p>									
30	What is SQL? Why do we use it?	2								
ANS	Structured Query Language (SQL) is the most popular query language used by major RDBMS to write a query (A request to a database for information retrieval and data manipulation).									
31	What do you mean by Query/ Querying in DBMS?	1								
ANS	Retrieving data from or data manipulation in a database through a special type of command or commands.									
32	Differentiate between int and bigint datatype in MYSQL.	1								
ANS	Both contain integral values but int value occupies till 4 bytes of storage while bigint occupies till 8 bytes of storage.									
33	Differentiate between int and float datatype in MYSQL.	1								
ANS	Int contains integral values and it occupies till 4 bytes of storage while float contains a number with decimal point values and it occupies till 8 bytes of storage.									
34	What is the format and the range of Date data type in MySQL?	1								
ANS	'YYYY-MM-DD' format which ranges from '1000-01-01' to '9999-12-31'									
35	What is the maximum value that can be stored in Float(10,2) ?	1								
ANS	99999999.99 (total 10 digits, 8 digits before and 2 digits after decimal point)									
36	A person wants to develop a new database named as "Cinema". What query he/she should use?	1								
ANS	CREATE DATABASE Cinema;									
37	Monika wants to see how many databases have already been developed in MySQL on her machine. What query she should write?	1								
ANS	SHOW DATABASES;									
38	Rohan wants to use a database titled as "Games" which have already been developed in MySQL on his machine. What query he should write?	1								
ANS	USE GAMES;									
39	Vaibhav wants to use a database titled as "School" which have already been developed in MySQL on his machine but before using this database he wants to check the list of databases which have already been developed in MySQL on this machine. What query he should write?	1								
ANS	SHOW DATABASES; USE SCHOOL;									
40	Rayana wants to remove a database titled as "Building" which have already been developed in MySQL on her machine. What query she should write?	1								
ANS	DROP DATABASE BUILDING;									
41	Is MySQL case sensitive? Explain.	1								
ANS	No, MySQL is not case sensitive. But it is case sensitive in the case of patterns enclosed within single(' ') or double (" ") quotation marks.									
42	Ravi wants to see the whole structure of a relation titled as "Car" which have already been developed in MySQL in the current database. What query he should write?	1								
ANS	DESC CAR; OR DESCRIBE CAR;									
43	James wants to see the whole structure of a relation titled as "MotorCycle" which have already been developed in MySQL in the database named as "TwoWheeler". What query he should write when he just opened MySQL on his machine?	1								
ANS	USE TWOWHEELER; DESC MOTORCYCLE;									
44	<p>Write the queries for the following purposes.</p> <p>Mr. Johnson wants to Create a Database "EMP" and after opening this database create a relation named as "Empl" with the following details:</p> <table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Data expected to be stored</th> <th>Data Type</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>emp_id</td> <td>Numeric value consisting of maximum 15 digits</td> <td>int(15)</td> <td>Primary Key</td> </tr> </tbody> </table>	Attribute Name	Data expected to be stored	Data Type	Constraint	emp_id	Numeric value consisting of maximum 15 digits	int(15)	Primary Key	3
Attribute Name	Data expected to be stored	Data Type	Constraint							
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ANS	CREATE DATABASE EMP; USE EMP; CREATE TABLE EMPL (EMP_ID INT(15) PRIMARY KEY, EMP_NAME VARCHAR(50) NOT NULL UNIQUE, SAL FLOAT(10, 2) CHECK (SAL>=10000.00), DOB DATE DEFAULT '2000-01-01');																						
45	Write the queries for the following purposes. Mrs. Sharda wants to Create a Database “HOSPITAL” and after opening this database create a relation named as “Patient” with the following details:			3																			
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ANS	CREATE DATABASE HOSPITAL; USE HOSPITAL; CREATE TABLE PATIENT (P_ID NUMERIC(10) PRIMARY KEY, P_NAME VARCHAR(30), P_TOTALAMT FLOAT(10, 2), EMP_ID INT(15) REFERENCES EMPL(EMP_ID));																						
46	Mr. John has written a query in which he has used an attribute name as Player-Id but the MySQL compiler has shown an error. What mistake he has committed?			1																			
ANS	Attribute/ Column name should always use underscore,not hyphen so the correct column is written as Player_Id.																						
47	Whether not null and default constraint may be applied on the same column altogether in a table or not? Also specify the reason.			2																			
ANS	No, not null and default may not be applied altogether on the same column because not null constraint applies the condition that the particular column should have a valid value mandatorily while default constraint applies the condition that the particular column should have a valid value mandatorily																						
48	What do you mean by Data/ Integrity Constraint in DBMS? What are column and table constraints? What is the utility of constraints in DBMS?			2																			
ANS	<ul style="list-style-type: none"> • Put some restrictions/ conditions/ limitations on the type of data that can be inserted in one or more columns of a table. • When the constraint is specified immediately after column definition in the table creation 																						

	<p>then it is called as Column_Constraint and when the constraint is specified on a number of columns (one or more than one column) in the last step after all columns' defined in the table creation query then it is called Table_Constraint.</p> <ul style="list-style-type: none"> • Constraints are used to ensure accuracy and reliability of data in the database. 																					
49	Differentiate between char and varchar datatype in MYSQL.	2																				
ANS	<table border="1"> <tr> <td>char</td><td>varchar</td></tr> <tr> <td>Char(n) specifies the Character type data of length n where n ranges from 0 to 255.</td><td>Varchar(n) specifies the Variable Character type data of length n where n ranges from 0 to 65535.</td></tr> <tr> <td>Char is of Fixed Length.</td><td>Varchar is of Variable Length.</td></tr> <tr> <td>Char(10) implies to reserve memory for 10 characters, if data does not have 10 characters (less than 10 characters), MySQL fills the remaining characters with space character padded at right side.</td><td>Varchar(10) implies a maximum of 10 characters can be stored but the actual allocated bytes will depend on length of entered string.</td></tr> <tr> <td>Example- 'Station' in char(10) will occupy 6 bytes only and rest 4 bytes will be padded with space character at right side and totally 10 bytes will be consumed/used by the compiler.</td><td>Example- 'Station' in varchar(10) will occupy 6 bytes only and rest 4 bytes will not be used by the compiler so in this data type memory is saved as compared to char data type for every value in the attributes of relation.</td></tr> </table>	char	varchar	Char(n) specifies the Character type data of length n where n ranges from 0 to 255.	Varchar(n) specifies the Variable Character type data of length n where n ranges from 0 to 65535.	Char is of Fixed Length.	Varchar is of Variable Length.	Char(10) implies to reserve memory for 10 characters, if data does not have 10 characters (less than 10 characters), MySQL fills the remaining characters with space character padded at right side.	Varchar(10) implies a maximum of 10 characters can be stored but the actual allocated bytes will depend on length of entered string.	Example- 'Station' in char(10) will occupy 6 bytes only and rest 4 bytes will be padded with space character at right side and totally 10 bytes will be consumed/used by the compiler.	Example- 'Station' in varchar(10) will occupy 6 bytes only and rest 4 bytes will not be used by the compiler so in this data type memory is saved as compared to char data type for every value in the attributes of relation.											
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50	Mr. Rahim has written a query to develop a relation names as Player but the MySQL compiler has shown an error. Whatever mistakes he has committed, Rewrite with correct code after rectifying those errors by underlying?	2																				
ANS	<table border="1"> <tr> <td> <pre>CREATE TABLE PLAYER (PLAYER_ID INT(15) PRIMARYKEY, PLAYER-NAME VARCHAR(50) NOT NULL UNIQUE, PL_SAL FLOAT(10, 2) CHECK >=10000.00, DOB DATE DEFAULT = '2000-01-01');</pre> </td><td> <pre>CREATE TABLE PLAYER (PLAYER_ID INT(15) PRIMARY KEY, PLAYER_NAME VARCHAR(50) NOT NULL UNIQUE, PL_SAL FLOAT(10, 2) CHECK (PL_SAL>=10000.00), DOB DATE DEFAULT '2000-01-01');</pre> </td></tr> </table>	<pre>CREATE TABLE PLAYER (PLAYER_ID INT(15) PRIMARYKEY, PLAYER-NAME VARCHAR(50) NOT NULL UNIQUE, PL_SAL FLOAT(10, 2) CHECK >=10000.00, DOB DATE DEFAULT = '2000-01-01');</pre>	<pre>CREATE TABLE PLAYER (PLAYER_ID INT(15) PRIMARY KEY, PLAYER_NAME VARCHAR(50) NOT NULL UNIQUE, PL_SAL FLOAT(10, 2) CHECK (PL_SAL>=10000.00), DOB DATE DEFAULT '2000-01-01');</pre>																			
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51	Mr. Rahim has written a query to develop a relation named as AirLines but the MySQL compiler has shown an error. Whatever mistakes he has committed, Rewrite with correct code after rectifying those errors by underlying?	2																				
ANS	<table border="1"> <tr> <td> <pre>CREATE AIRLINES (AL-ID INT(15) PRIMARY KEY, AL_NAME VARCHAR(50) NOT NULL, AL_COST FLOAT(10, 2) CHECK >=50000000.00, EMP_ID INT(15) REFERENCE EMP(EMP_ID);</pre> </td><td> <pre>CREATE TABLE AIRLINES (AL_ID INT(15) PRIMARY KEY, AL_NAME VARCHAR(50) NOT NULL, AL_COST FLOAT(10, 2) CHECK (AL_COST>=50000000.00), EMP_ID INT(15) REFERENCES EMP(EMP_ID));</pre> </td></tr> </table>	<pre>CREATE AIRLINES (AL-ID INT(15) PRIMARY KEY, AL_NAME VARCHAR(50) NOT NULL, AL_COST FLOAT(10, 2) CHECK >=50000000.00, EMP_ID INT(15) REFERENCE EMP(EMP_ID);</pre>	<pre>CREATE TABLE AIRLINES (AL_ID INT(15) PRIMARY KEY, AL_NAME VARCHAR(50) NOT NULL, AL_COST FLOAT(10, 2) CHECK (AL_COST>=50000000.00), EMP_ID INT(15) REFERENCES EMP(EMP_ID));</pre>																			
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52	<p>Write the queries for the following purposes. Mrs. Sheikh wants to Create a Database "ECONOMY" and after opening this database create a relation "Customer" with the following details:</p> <table border="1"> <thead> <tr> <th>Attribute Name</th> <th>Data expected to be stored</th> <th>Data Type</th> <th>Constraint</th> </tr> </thead> <tbody> <tr> <td>Cust_Id</td> <td>Numeric value consisting of maximum 15 digits</td> <td>numeric(15)</td> <td>Primary Key</td> </tr> <tr> <td>Cust_Name</td> <td>Variant length string of maximum 40 characters</td> <td>varchar(40)</td> <td>If not any value is provided then it should be 'XYZ'</td> </tr> <tr> <td>Age</td> <td>Numeric value consisting of maximum 02 digits</td> <td>int(2)</td> <td></td> </tr> <tr> <td>C_Income_Gp</td> <td>Decimal point based</td> <td>float(9,2)</td> <td>it should be greater</td> </tr> </tbody> </table>	Attribute Name	Data expected to be stored	Data Type	Constraint	Cust_Id	Numeric value consisting of maximum 15 digits	numeric(15)	Primary Key	Cust_Name	Variant length string of maximum 40 characters	varchar(40)	If not any value is provided then it should be 'XYZ'	Age	Numeric value consisting of maximum 02 digits	int(2)		C_Income_Gp	Decimal point based	float(9,2)	it should be greater	3
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C_Income_Gp	Decimal point based	float(9,2)	it should be greater																			

		numeric value consisting of total 9 digits and 2 digits after decimal point		than equal to 5500.00																											
ANS		CREATE DATABASE ECONOMY; USE ECONOMY; CREATE TABLE CUSTOMER (CUST_ID NUMERIC(15) PRIMARY KEY, CUST_NAME VARCHAR(40) DEFAULT 'XYZ', AGE INT(2), C_INCOME_GP FLOAT(9,2) CHECK (C_INCOME_GP>=5500.00));																													
53		Write the queries for the following purposes. Mrs. Akhil wants to Create a Database "GAME" and after opening this database create a relation "Sport" with the following details:				3																									
		<table border="1"> <thead> <tr> <th>Attribute Name</th><th>Data expected to be stored</th><th>Data Type</th><th>Constraint</th><th></th></tr> </thead> <tbody> <tr> <td>Sp_Id</td><td>Numeric value consisting of maximum 14 digits</td><td>Numeric (14)</td><td>Primary Key</td><td></td></tr> <tr> <td>Sp_Name</td><td>Variant length string of maximum 25 characters</td><td>Varchar (25)</td><td>Not duplicated and Not empty</td><td></td></tr> <tr> <td>Sp_Type</td><td>Variant length string of maximum 10 characters</td><td>Varchar (10)</td><td></td><td></td></tr> <tr> <td>Sp_Exp</td><td>Integral value consisting of maximum 2 digits</td><td>int(2)</td><td>it should be greater than 2</td><td></td></tr> </tbody> </table>					Attribute Name	Data expected to be stored	Data Type	Constraint		Sp_Id	Numeric value consisting of maximum 14 digits	Numeric (14)	Primary Key		Sp_Name	Variant length string of maximum 25 characters	Varchar (25)	Not duplicated and Not empty		Sp_Type	Variant length string of maximum 10 characters	Varchar (10)			Sp_Exp	Integral value consisting of maximum 2 digits	int(2)	it should be greater than 2	
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		After creation of this table she wants to see all the table names in this database.																													
ANS		CREATE DATABASE GAME; USE GAME; CREATE TABLE SPORT (SP_ID NUMERIC(14) PRIMARY KEY, SP_NAME VARCHAR(25) NOT NULL UNIQUE, SP_TYPE VARCHAR(10), SP_EXP INT(2) CHECK (SP_EXP>2)); Show Tables;																													
54		Write the queries for the following purposes. Mrs. Akila wants to Create a Database "PURCHASE" and after opening this database create a relation "ITEM" with the following details:				3																									
		<table border="1"> <thead> <tr> <th>Attribute Name</th><th>Data expected to be stored</th><th>Data Type</th><th>Constraint</th><th></th></tr> </thead> <tbody> <tr> <td>Item_No</td><td>Numeric value consisting of maximum 14 digits</td><td>Numeric (14)</td><td>Primary Key</td><td></td></tr> <tr> <td>Item_Name</td><td>Variant length string of maximum 25 characters</td><td>varchar(25)</td><td>Not duplicated and Not empty</td><td></td></tr> <tr> <td>Item_Price</td><td>Decimal point based numeric value consisting of total 10 digits and 2 digits after decimal point</td><td>float(10,2)</td><td></td><td></td></tr> <tr> <td>Item_DOE</td><td>Date type value</td><td>date</td><td>If not any value is provided then it should be '2022-12-31'</td><td></td></tr> </tbody> </table>					Attribute Name	Data expected to be stored	Data Type	Constraint		Item_No	Numeric value consisting of maximum 14 digits	Numeric (14)	Primary Key		Item_Name	Variant length string of maximum 25 characters	varchar(25)	Not duplicated and Not empty		Item_Price	Decimal point based numeric value consisting of total 10 digits and 2 digits after decimal point	float(10,2)			Item_DOE	Date type value	date	If not any value is provided then it should be '2022-12-31'	
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		After creation of this table she wants to see all the table names in this database.																													
ANS		CREATE DATABASE PURCHASE; USE PURCHASE; CREATE TABLE ITEM (ITEM_NO NUMERIC(14) PRIMARY KEY, ITEM_NAME VARCHAR(25) NOT NULL UNIQUE, ITEM_PRICE FLOAT(10,2), ITEM_DOE DATE DEFAULT '2022-12-31'); Show Tables;																													

55	<p>Mr. Bhuvnesh wants to develop a relation named as "Invoice". Write the query to for the this purpose with the following details:</p> <table border="1"> <thead> <tr> <th>Attribute Name</th><th>Data expected to be stored</th><th>Data Type</th><th>Constraint</th></tr> </thead> <tbody> <tr> <td>Invoice_Id</td><td>Numeric value consisting of maximum 18 digits</td><td>numeric(18)</td><td>Primary Key</td></tr> <tr> <td>Invoice_DT</td><td>Date type value</td><td>date</td><td></td></tr> <tr> <td>Invoice_Amt</td><td>Decimal point based numeric value consisting of total 15 digits and 2 digits after decimal point</td><td>float(15,2)</td><td></td></tr> <tr> <td>Cust_Id</td><td>Integral value consisting of maximum 15 digits</td><td>int(15)</td><td>Referenced from Master table "Customer" primary key column Cust_id with integral type upto 15 digits</td></tr> </tbody> </table> <p>After table creation, write the query to show the structure of the table.</p>	Attribute Name	Data expected to be stored	Data Type	Constraint	Invoice_Id	Numeric value consisting of maximum 18 digits	numeric(18)	Primary Key	Invoice_DT	Date type value	date		Invoice_Amt	Decimal point based numeric value consisting of total 15 digits and 2 digits after decimal point	float(15,2)		Cust_Id	Integral value consisting of maximum 15 digits	int(15)	Referenced from Master table "Customer" primary key column Cust_id with integral type upto 15 digits	3
Attribute Name	Data expected to be stored	Data Type	Constraint																			
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Cust_Id	Integral value consisting of maximum 15 digits	int(15)	Referenced from Master table "Customer" primary key column Cust_id with integral type upto 15 digits																			
ANS	<pre>CREATE TABLE INVOICE (INVOICE_ID NUMERIC(18) PRIMARY KEY, INVOICE_DT DATE, INVOICE_AMT FLOAT(15, 2), CUST_ID INT(15) REFERENCES CUSTOMER(CUST_ID)); Desc INVOICE; OR Describe INVOICE;</pre>																					

TOPIC: alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command

Q. NO	QUESTIONS WITH ANSWER	MARKS								
1	Which command of SQL is used to change/modify the structure of a table?	1								
ANS	ALTER TABLE									
2	Ms. Shruti has created a table GAMES having attributes ID, GAME, NO_OF_PLAYERS. Later she wants to add a new attribute DURATION of integer type in this table. How can she do this? Write down a full command.	1								
ANS	ALTER TABLE Games ADD Duration int(3);									
3	A table TEACHER has attributes CODE, NAME, POST, CATEGORY. Write down command to delete the attribute CATEGORY from this table.	1								
ANS	ALTER TABLE Teacher DROP Category;									
4	A table TEACHER has no primary key. Which command will be used to make one if its attribute named CODE its primary key?	1								
ANS	ALTER TABLE TEACHER ADD PRIMARY KEY(CODE);									
5	What will happen if following command is executed : - ALTER TABLE EMPLOYEE DROP PRIMARY KEY;	1								
ANS	After executing the above command the primary key of the EMPLOYEE table will be removed from the primary key and there will be no primary key in this table.									
6	Differentiate ALTER TABLE and UPDATE command?	1								
ANS	<table border="1"> <tr> <td>ALTER TABLE</td> <td>UPDATE</td> </tr> <tr> <td>Used to change/modify the structure of the table</td> <td>Used to change/modify the data in the table</td> </tr> <tr> <td>It is a DDL command</td> <td>It is a DML command</td> </tr> <tr> <td>Being a DDL command it can not be rolled back or undone</td> <td>Being a DML command it can be rolled back or undone</td> </tr> </table>	ALTER TABLE	UPDATE	Used to change/modify the structure of the table	Used to change/modify the data in the table	It is a DDL command	It is a DML command	Being a DDL command it can not be rolled back or undone	Being a DML command it can be rolled back or undone	
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7	While working in MySQL Mr. Hitesh wants to delete an existing table MEMBER, but he is confused between DELETE and DROP TABLE commands. Help him to choose the correct one	1								

	out of the following commands: - DROP TABLE MEMBER; DELETE FROM MEMBER;																																				
ANS	He must choose command (a) i.e. DROP TABLE MEMBER because it will remove/delete the whole table from the database whereas the command (b) will remove all the tuples from the table and will make it empty.																																				
8	What is the purpose of IS NULL and IS NOT NULL operators?	1																																			
ANS	IS NULL and IS NOT NULL operators are used for filtering tuples from the table having or not having NULL values in a specific attribute. E.g. SELECT * FROM STUDENT WHERE DOB IS NULL; SELECT * FROM STUDENT WHERE CLASS IS NOT NULL;																																				
9	What is the use of LIKE operator in SQL?	1																																			
ANS	Like operator is used for matching patterns of character values on specific attributes and filter out the tuples on the basis of the given patterns. It uses two wildcard characters % and _ (Underscore) for specifying patterns.																																				
10	Assume a table PRODUCT has an attribute BRAND with following contents <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>BRAND</td></tr> <tr><td>DELL</td></tr> <tr><td>HCL</td></tr> <tr><td>DELL</td></tr> <tr><td>WIPRO</td></tr> <tr><td>WIPRO</td></tr> </table>	BRAND	DELL	HCL	DELL	WIPRO	WIPRO	What will be the output of following queries: - A. SELECT BRAND FROM PRODUCT B. SELECT DISTINCT BRAND FROM PRODUCT																													
BRAND																																					
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11	What do you mean by the term alias in SQL? Explain briefly by an example?	2																																			
ANS	The term Alias means providing an attribute or a table with another temporary name in a query. For this AS keyword is used. Example: - SELECT ID AS "Product ID", Product_Name, PRICE, PRICE*.10 AS "DISCOUNT" FROM PRODUCT In the output of the above query, the attribute ID will be displayed as Product ID and Price*.10 will be displayed as DISCOUNT.																																				
12	Write the name of any two commands under DDL and DML each ?	2																																			
ANS	DDL → CREATE TABLE, ALTER TABLE, DROP TABLE DML → SELECT, INSERT, DELETE, UPDATE																																				
13	Write the output of the queries (a) to (d) based on the table PLAYER given below: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr><th colspan="5">PLAYER</th></tr> <tr><th>PID</th><th>PNAME</th><th>GENDER</th><th>GAME</th><th>RANK</th></tr> </thead> <tbody> <tr><td>P01</td><td>JASPRIT</td><td>M</td><td>CRICKET</td><td>5</td></tr> <tr><td>P02</td><td>SAYNA</td><td>F</td><td>BADMINTON</td><td>9</td></tr> <tr><td>P03</td><td>SANIYA</td><td>F</td><td>TENNIS</td><td>15</td></tr> <tr><td>P04</td><td>VIRAT</td><td>M</td><td>CRICKET</td><td>1</td></tr> <tr><td>P05</td><td>LAKSHYA</td><td>M</td><td>BADMINTON</td><td>51</td></tr> </tbody> </table>	PLAYER					PID	PNAME	GENDER	GAME	RANK	P01	JASPRIT	M	CRICKET	5	P02	SAYNA	F	BADMINTON	9	P03	SANIYA	F	TENNIS	15	P04	VIRAT	M	CRICKET	1	P05	LAKSHYA	M	BADMINTON	51	2
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	<p>a. SELECT PNAME, GAME FROM PLAYER WHERE GENDER="F"; b. SELECT DISTINCT GAME FROM PLAYER; c. SELECT PID,PNAME,RANK FROM PLAYER WHERE GAME="CRICKET" ORDER BY RANK; d. SELECT * FROM PLAYER WHERE GENDER<>"M" AND RANK<10;</p>																														
ANS	<p>a.</p> <table border="1"> <tr><th>PNAME</th><th>GAME</th></tr> <tr><td>SAYNA</td><td>BADMINTON</td></tr> <tr><td>SANIYA</td><td>TENNIS</td></tr> </table> <p>b.</p> <table border="1"> <tr><th>GAME</th></tr> <tr><td>CRICKET</td></tr> <tr><td>BADMINTON</td></tr> <tr><td>TENNIS</td></tr> </table> <p>c.</p> <table border="1"> <tr><th>PID</th><th>PNAME</th><th>RANK</th></tr> <tr><td>P04</td><td>VIRAT</td><td>1</td></tr> <tr><td>P01</td><td>JASPRIT</td><td>5</td></tr> </table> <p>d.</p> <table border="1"> <tr><th>PID</th><th>PNAME</th><th>GENDER</th><th>GAME</th><th>RANK</th></tr> <tr><td>P02</td><td>SAYNA</td><td>F</td><td>BADMINTON</td><td>9</td></tr> </table>	PNAME	GAME	SAYNA	BADMINTON	SANIYA	TENNIS	GAME	CRICKET	BADMINTON	TENNIS	PID	PNAME	RANK	P04	VIRAT	1	P01	JASPRIT	5	PID	PNAME	GENDER	GAME	RANK	P02	SAYNA	F	BADMINTON	9	
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14	<p>Write the output of the queries (a) to (d) based on the table COACH given below:</p> <p style="text-align: center;">COACH</p> <table border="1"> <thead> <tr><th>NO</th><th>CNAME</th><th>GAME</th><th>FEE</th></tr> </thead> <tbody> <tr><td>01</td><td>KAPIL</td><td>CRICKET</td><td>50000</td></tr> <tr><td>02</td><td>VIJENDER</td><td>BOXING</td><td>90000</td></tr> <tr><td>03</td><td>MARIA</td><td>TENNIS</td><td>15000</td></tr> <tr><td>04</td><td>NEERAJ</td><td>ATHLETICS</td><td>51000</td></tr> <tr><td>05</td><td>GOPICHAND</td><td>NULL</td><td>10000</td></tr> </tbody> </table> <p>a. SELECT NO,CNAME FROM COACH WHERE GAME IS NULL; b. SELECT CNAME FROM COACH WHERE GAME LIKE "T%"; c. SELECT CNAME,GAME, FEE FROM COACH WHERE FEE BETWEEN 51000 AND 100000; d. SELECT * FROM COACH WHERE GAME IN ("CRICKET","BOXING");</p>	NO	CNAME	GAME	FEE	01	KAPIL	CRICKET	50000	02	VIJENDER	BOXING	90000	03	MARIA	TENNIS	15000	04	NEERAJ	ATHLETICS	51000	05	GOPICHAND	NULL	10000	2					
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15	<p>Write the queries (a) to (d) based on the table, PLAYER given below:</p> <p style="text-align: center;">PLAYER</p> <table border="1"> <thead> <tr> <th>PID</th><th>PNAME</th><th>GENDER</th><th>GAME</th><th>RANK</th></tr> </thead> <tbody> <tr> <td>P01</td><td>JASPRIT</td><td>M</td><td>CRICKET</td><td>5</td></tr> <tr> <td>P02</td><td>SAYNA</td><td>F</td><td>BADMINTON</td><td>9</td></tr> <tr> <td>P03</td><td>SANIYA</td><td>F</td><td>TENNIS</td><td>15</td></tr> <tr> <td>P04</td><td>VIRAT</td><td>M</td><td>CRICKET</td><td>1</td></tr> <tr> <td>P05</td><td>LAKSHYA</td><td>M</td><td>BADMINTON</td><td>51</td></tr> </tbody> </table> <p>a. Display details of all male employees b. Display player name and game whose rank is 5 to 10 c. Show PID PName and rank whose game is either Tennis or Cricket. d. Add a new record in the table ("P06", "Abhinav", "M", "Shooting", 1)</p>	PID	PNAME	GENDER	GAME	RANK	P01	JASPRIT	M	CRICKET	5	P02	SAYNA	F	BADMINTON	9	P03	SANIYA	F	TENNIS	15	P04	VIRAT	M	CRICKET	1	P05	LAKSHYA	M	BADMINTON	51	4
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ANS	<p>a. SELECT * FROM PLAYER WHERE GENDER="M"; b. SELECT PNAME, GAME FROM PLAYER WHERE RANK BETWEEN 5 AND 10; c. SELECT PID, PNAME, RANK FROM PLAYER WHERE GAME IN ("TENNIS", "CRICKET"); d. INSERT INTO PLAYER VALUES("P06", "Abhinav", "M", "Shooting", 1);</p>																															
Q.16	<p>Write the queries (a) to (d) based on the table BOOK given below:</p> <p style="text-align: center;">BOOK</p> <table border="1"> <thead> <tr> <th>BNO</th><th>TITLE</th><th>AUTHOR</th><th>DATE_PURCHASED</th><th>PRICE</th></tr> </thead> <tbody> <tr> <td>P01</td><td>IP CLASS XI</td><td>A ARORA</td><td>2020-01-05</td><td>350</td></tr> <tr> <td>P02</td><td>COMP SCI</td><td>P ARORA</td><td>2020-10-15</td><td>250</td></tr> <tr> <td>P03</td><td>CS CLASS XII</td><td>NCERT</td><td>2021-06-30</td><td>NULL</td></tr> <tr> <td>P04</td><td>ACCOUNTANCY</td><td>CBSE</td><td>2022-01-01</td><td>550</td></tr> <tr> <td>P05</td><td>IP With PYTHON</td><td>NCERT</td><td>2021-12-01</td><td>400</td></tr> </tbody> </table> <p>a. Display details of the books whose price not mentioned b. Display title and date of purchase of the books having "IP" in their title. c. Display all the details of books by NCERT in the descending order of their price. d. Add Rs. 50 in the price of all the books by CBSE.</p>	BNO	TITLE	AUTHOR	DATE_PURCHASED	PRICE	P01	IP CLASS XI	A ARORA	2020-01-05	350	P02	COMP SCI	P ARORA	2020-10-15	250	P03	CS CLASS XII	NCERT	2021-06-30	NULL	P04	ACCOUNTANCY	CBSE	2022-01-01	550	P05	IP With PYTHON	NCERT	2021-12-01	400	4
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ANS	<p>a. SELECT * FROM BOOK WHERE PRICE IS NULL; b. SELECT TITLE, DATE_PURCHASED FROM BOOK WHERE TITLE LIKE "%IP%"; c. SELECT * FROM BOOK WHERE AUTHOR="NCERT" ORDER BY PRICE DESC d. UPDATE BOOK SET PRICE=PRICE+50 WHERE AUTHOR = "CBSE";</p>																															
17	<p>Write the queries (a) to (d) based on the table BOOK given below:</p> <p style="text-align: center;">BOOK</p> <table border="1"> <thead> <tr> <th>BNO</th><th>TITLE</th><th>AUTHOR</th><th>DATE_PURCHASED</th><th>PRICE</th></tr> </thead> <tbody> <tr> <td>P01</td><td>IP CLASS XI</td><td>A ARORA</td><td>2020-01-05</td><td>350</td></tr> <tr> <td>P02</td><td>COMP SCI</td><td>P ARORA</td><td>2020-10-15</td><td>250</td></tr> <tr> <td>P03</td><td>CS CLASS XII</td><td>NCERT</td><td>2021-06-30</td><td>NULL</td></tr> <tr> <td>P04</td><td>ACCOUNTANCY</td><td>CBSE</td><td>2022-01-01</td><td>550</td></tr> <tr> <td>P05</td><td>IP With PYTHON</td><td>NCERT</td><td>2021-12-01</td><td>400</td></tr> </tbody> </table> <p>a. Display details of the books which have been purchased before 01-01-2022 b. Display BNO, TITLE and PRICE of books which book no is P01, P03 or P05. c. Delete all the books whose price is not given. d. Increase the price of all the books by 10% whose price is below 300.</p>	BNO	TITLE	AUTHOR	DATE_PURCHASED	PRICE	P01	IP CLASS XI	A ARORA	2020-01-05	350	P02	COMP SCI	P ARORA	2020-10-15	250	P03	CS CLASS XII	NCERT	2021-06-30	NULL	P04	ACCOUNTANCY	CBSE	2022-01-01	550	P05	IP With PYTHON	NCERT	2021-12-01	400	4
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P05	IP With PYTHON	NCERT	2021-12-01	400																												
ANS	<p>a. SELECT * FROM BOOK WHERE DATE_PURCHASED < '2022-01-01'; b. SELECT BNO, TITLE, PRICE FROM BOOK WHERE TITLE IN ("P01", "P02", "P03"); c. DELETE FROM BOOKS WHERE PRICE IS NULL; d. UPDATE BOOK SET PRICE=PRICE+PRICE*.10 WHERE PRICE<300;</p>																															
18	<p>Consider the given table Employee and answer the questions given below:</p> <p style="text-align: center;">TABLE:EMPLOYEE</p>	14X1=14																														

EMP_ID	EMP_NAME	EMP_CITY	EMP_DOB	EMP_SALARY
2	RAJESH	JAIPUR	12/2/1998	50000
3	SURESH	DELHI	24/12/1990	60000
4	AMAN	JAIPUR	15/3/1888	NULL
5	RAJNI	TONK	20/5/2000	90000
6	HARISH	BARMER	13/6/2021	100000
7	PIHU	SIKAR	17/4/2005	19000

- To display the details of the Employee whose price is in the range of 5000 to 10000(Both values included).
- To increase the salary of Employee by 20% as a bonus.
- To list the names of those employees who belong to city jaipur,delhi,sikar.
- To display unique city from a table Employee.
- Add a new record in above table with the following data:
(8,rehan,delhi,3-4-2006,4000)
- To arrange records in descending order of name.
- List the names of employees whose salary is more than 200000 and less than 300000.
- In above table Ram has forgotten to define primary key.Now he wants to define primary key in the above table.Help ram to write command to make Emp_ID as primary key.
- Mr. Ram wants to remove the above table with its structure.Help ram to write command to remove above table.
- Mr.Harish has left the company.Kindly remove his record from the above table. In the above table Emp_ID is the primary key.Now Mr ram wants to remove this constraint .Help ram to write commands for the same.
- Display the name of an employee whose salary is not defined yet.
- Mr.Ram wants to give salary rs 5000 to those employees whose salary is not defined yet.Ram has written the following query:
- Update Employee Set Salary=5000 having Salary is not NULL
- Display the names of employee whose city name is of 4 character long.

Ans.	<ol style="list-style-type: none"> SELECT * FROM EMPLOYEE WHERE EMP_SALARY BETWEEN 5000 AND 10000; UPDATE EMPLOYEE SET EMP_SALARY=EMP_SALARY+(.2*EMP_SALARY); SELECT EMP_NAME FROM EMPLOYEE WHERE EMP_CITY IN('JAIPUR','DELHI','SIKAR'); SELECT DISTINCT(EMP_CITY) FROM EMPLOYEE; INSERT INTO EMPLOYEE VALUES(8,'REHAN','DELHI','3-4-2006',4000); SELECT * FROM EMPLOYEE ORDER BY EMP_NAME DESC; SELECT EMP_NAME FROM EMPLOYEE WHERE EMP_SALARY>200000 AND EMP_SALARY<300000; ALTER TABLE EMPLOYEE ADD PRIMARY KEY(EMP_ID); DROP TABLE EMPLOYEE; DELETE FROM EMPLOYEE WHERE EMP_NAME = 'HARISH'; ALTER TABLE EMPLOYEE DROP PRIMARY KEY; SELECT EMP_NAME FROM EMPLOYEE WHERE EMP_SALARY IS NULL; UPDATE EMPLOYEE SET EMP_SALARY=5000 WHERE EMP_SALARY IS NULL; SELECT EMP_NAME FROM EMPLOYEE WHERE EMP_CITY LIKE '___'; 	
------	--	--

19	<p>Consider the given table Player and answer the questions given below:</p> <p>TABLE:PLAYER</p> <table border="1"> <thead> <tr> <th>PLAYER_SN</th><th>PLAYER_NAME</th><th>PLAYER_CITY</th><th>PLAYER_SCORE</th><th>PLAYER_SALARY</th></tr> </thead> <tbody> <tr> <td>2</td><td>RAJESH</td><td>JAIPUR</td><td>100</td><td>10000</td></tr> <tr> <td>3</td><td>SURESH</td><td>DELHI</td><td>90</td><td>20000</td></tr> <tr> <td>4</td><td>AMAN</td><td>JAIPUR</td><td>50</td><td>40000</td></tr> <tr> <td>5</td><td>RAJNI</td><td>TONK</td><td>39</td><td>50000</td></tr> <tr> <td>6</td><td>HARISH</td><td>BARMER</td><td>69</td><td>200000</td></tr> <tr> <td>7</td><td>PIHU</td><td>SIKAR</td><td>77</td><td>800000</td></tr> </tbody> </table> <ol style="list-style-type: none"> To display the details of Players who scored centuries in ascending order of their name . To increase the salary of Player by 50% if he scored a century. To list the names of those Players whose name length is 5 characters and end with 'ESH' . 	PLAYER_SN	PLAYER_NAME	PLAYER_CITY	PLAYER_SCORE	PLAYER_SALARY	2	RAJESH	JAIPUR	100	10000	3	SURESH	DELHI	90	20000	4	AMAN	JAIPUR	50	40000	5	RAJNI	TONK	39	50000	6	HARISH	BARMER	69	200000	7	PIHU	SIKAR	77	800000	8X1=8
PLAYER_SN	PLAYER_NAME	PLAYER_CITY	PLAYER_SCORE	PLAYER_SALARY																																	
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7	PIHU	SIKAR	77	800000																																	

	<p>4. To display unique city from table Player.</p> <p>5. add a new record in above table with the following data: (8,piyush,kota,90,14000)</p> <p>6. List the names of Players who belong to city jaipur or tonk.</p> <p>7. Mr. Ram wants to add one more column "coach_name" .Help ram to write commands .</p> <p>8. To Display records in descending order of Salary.</p>																																																		
	<p>1. SELECT * FROM PLAYER WHERE PLAYER_SCORE>=100 ORDER BY PLAYER_NAME ASC;</p> <p>2. UPDATE PLAYER SET PLAYER_SALARY=PLAYER_SALARY+(.5*PLAYER_SALARY);</p> <p>3. SELECT PLAYER_NAME FROM PLAYER WHERE PLAYER_NAME LIKE '_ ESH';</p> <p>4. SELECT DISTINCT PLAYER_CITY FROM PLAYER;</p> <p>5. INSERT INTO PLAYER VALUES (8,'piyush','kota',90,14000);</p> <p>6. SELECT PLAYER_NAME FROM PLAYER WHERE PLAYER_CITY='JAIPUR' OR CITY='TONK';</p> <p>7. ALTER TABLE PLAYER ADD COACH_NAME CHAR(10);</p> <p>8. SELECT * FROM PLAYER ORDER BY PLAYER_SALARY DESC;</p>																																																		
20	What is the cartesian product of two tables?	2																																																	
Ans	<ul style="list-style-type: none"> CARTESIAN PRODUCT:All rows in the first table are concatenated with all the rows in the second table. Number of Rows in resultant table=Number of Rows in first table X Number of rows in second table Number of Columns in resultant table=Number of Columns in first table + Number of Columns in second table 																																																		
21	What is the difference between where clause and having clause?	1																																																	
Ans	<table border="1"> <tr> <td>WHERE CLAUSE</td><td>HAVING CLAUSE</td></tr> <tr> <td>It is used to apply conditions on individual rows.</td><td>It is used to apply conditions on a group of rows.</td></tr> <tr> <td>Example: Select * from customer where salary>2000;</td><td>Example: Select city,sum(salary) from customer group by city having city="jaipur";</td></tr> </table>	WHERE CLAUSE	HAVING CLAUSE	It is used to apply conditions on individual rows.	It is used to apply conditions on a group of rows.	Example: Select * from customer where salary>2000;	Example: Select city,sum(salary) from customer group by city having city="jaipur";																																												
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22	What is equi join?Explain with suitable example.	2																																																	
Ans	<p>It joins two tables on equality of values in matching column (s) of the specified tables.</p> <p>CUSTOMER(ID,NAME,CITY) ORDER(ORDERID,ID,AMOUNT)</p> <p>Select * from CUSTOMER,ORDER where CUSTOMER.ID=ORDER.ID;</p>																																																		
23	<p>Answer the following questions based on table CUSTOMER and ORDER.</p> <p>CUSTOMER:</p> <table border="1"> <thead> <tr> <th>ID</th><th>NAME</th><th>AGE</th><th>ADDRESS</th><th>SALARY</th></tr> </thead> <tbody> <tr> <td>1</td><td>RAMESH</td><td>32</td><td>DELHI</td><td>2000</td></tr> <tr> <td>2</td><td>SURESH</td><td>25</td><td>KOTA</td><td>1500</td></tr> <tr> <td>3</td><td>HARDIK</td><td>27</td><td>BHOPAL</td><td>6500</td></tr> <tr> <td>4</td><td>RAVI</td><td>33</td><td>MP</td><td>8500</td></tr> </tbody> </table> <p>ORDER:</p> <table border="1"> <thead> <tr> <th>ORDER_ID</th><th>ORDER_DATE</th><th>CUSTOMER_ID</th><th>AMOUNT</th></tr> </thead> <tbody> <tr> <td>101</td><td>12/11/1990</td><td>2</td><td>100</td></tr> <tr> <td>102</td><td>1/2/2000</td><td>3</td><td>200</td></tr> <tr> <td>103</td><td>3/4/1999</td><td>4</td><td>300</td></tr> <tr> <td>104</td><td>18/2/2003</td><td>5</td><td>500</td></tr> <tr> <td>105</td><td>17/9/2016</td><td>3</td><td>234</td></tr> </tbody> </table> <p>(i) Which column can be most suitable to set as a primary key in table customer with suitable explanation? (ii) Ram wants to set CUSTOMER_ID as a foreign key in table ORDER.But he is facing some problem.Help Ram to remove discrepancy if any that restrict CUSTOMER_ID to act as a foreign key. Note:(Primary Key in table CUSTOMER:ID, Primary Key in table ORDER:ORDER_ID)</p>	ID	NAME	AGE	ADDRESS	SALARY	1	RAMESH	32	DELHI	2000	2	SURESH	25	KOTA	1500	3	HARDIK	27	BHOPAL	6500	4	RAVI	33	MP	8500	ORDER_ID	ORDER_DATE	CUSTOMER_ID	AMOUNT	101	12/11/1990	2	100	102	1/2/2000	3	200	103	3/4/1999	4	300	104	18/2/2003	5	500	105	17/9/2016	3	234	2
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Ans	PRIMARY KEY:ID Explanation :																																																		

	<p>(i) It has unique values (values in ID column can not be same) (ii) It has NOT NULL.</p> <p>Discrepancy: Scope of values in foreign key must be from the domain of primary key of other table.</p> <p>Correction Required: CUSTOMER_ID with value 5 must be removed or must be from the domain of ID from customer table.</p>									
TOPIC: Aggregate functions (max, min, avg, sum, count), group by, having clause, joins : Cartesian product on two tables, equi-join and natural join										
Q. NO	QUESTIONS WITH ANSWER	MARKS								
1	What are the different categories of functions in SQL?	1								
ANS	Types of functions in SQL Single Row Functions - LEN(), UPPER(), LOWER() ETC. Aggregate Functions - SUM(), MAX() ETC									
2	What do you understand by Aggregate functions in SQL?	1								
ANS	An aggregate function in SQL performs a calculation on multiple values and returns a single value. SQL provides following aggregate functions: - Sum(), Avg(), Count(), Max(), Min()									
3	What is the purpose of the GROUP BY clause?	1								
ANS	The GROUP BY statement groups rows that have the same values into summary rows. The GROUP BY statement is often used with aggregate functions									
4	Differentiate WHERE and HAVING clause?	1								
ANS	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">WHERE Clause</td><td style="padding: 5px;">HAVING Clause</td></tr> <tr> <td style="padding: 5px;">The WHERE clause works on row's data</td><td style="padding: 5px;">The HAVING clause works on aggregated data</td></tr> <tr> <td style="padding: 5px;">WHERE clause can be used with or without GROUP BY clause</td><td style="padding: 5px;">Having clause is always used only with GROUP BY clause</td></tr> <tr> <td style="padding: 5px;">SELECT * FROM EMP WHERE EMPID>105;</td><td style="padding: 5px;">SELECT POST, COUNT(*) FROM EMP GROUP BY POST HAVING COUNT(*)>2;</td></tr> </table> <p style="margin-top: 5px;">The difference between the having and where clause in SQL is that the whereas..</p>	WHERE Clause	HAVING Clause	The WHERE clause works on row's data	The HAVING clause works on aggregated data	WHERE clause can be used with or without GROUP BY clause	Having clause is always used only with GROUP BY clause	SELECT * FROM EMP WHERE EMPID>105;	SELECT POST, COUNT(*) FROM EMP GROUP BY POST HAVING COUNT(*)>2;	
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SELECT * FROM EMP WHERE EMPID>105;	SELECT POST, COUNT(*) FROM EMP GROUP BY POST HAVING COUNT(*)>2;									
5	Write query to find number of tuples/records in table named EMP.	1								
ANS	SELECT COUNT(*) FROM EMP;									
6	A table CLIENT has an attribute AGE. What will be the output of the following query based on the data of AGE column given below: - SELECT COUNT(AGE) FROM CLIENT;	1								
	<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr><td style="padding: 2px;">AGE</td></tr> <tr><td style="padding: 2px;">40</td></tr> <tr><td style="padding: 2px;">NULL</td></tr> <tr><td style="padding: 2px;">50</td></tr> <tr><td style="padding: 2px;">30</td></tr> </table>	AGE	40	NULL	50	30				
AGE										
40										
NULL										
50										
30										
ANS	COUNT(AGE) 3									
7	Consider table given in Question 6 and write down the output of the following query: - SELECT AVG(AGE) FROM CLIENT;	1								
ANS	AVG(AGE) 40									
8	What is join? What are different types of joins in SQL?	2								
ANS	A join is used to combine rows from two or more tables, based on a related column between them. Type of Joins: - <ul style="list-style-type: none"> • Cross Join/Cartesian Product 									

	<ul style="list-style-type: none"> • Equi Join • Natural Join 																																													
9	Explain Cartisian product/Cross join in SQL?	2																																												
ANS	<p>In a CARTESIAN JOIN there is a join for each row of one table to every row of another table. This usually happens when the matching column or WHERE condition is not specified.</p> <p>Example</p> <table border="1"> <tr> <td style="text-align: center;">Table1</td> <td style="text-align: center;">Table2</td> </tr> <tr> <td> <table border="1"> <tr> <th>A</th> <th>B</th> </tr> <tr> <td>1</td> <td>XYZ</td> </tr> <tr> <td>2</td> <td>PQR</td> </tr> </table> </td> <td> <table border="1"> <tr> <th>A</th> <th>C</th> <th>D</th> </tr> <tr> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>C2</td> <td>20</td> </tr> </table> </td> </tr> </table> <p>Cartesian product of Table 1 and Table 2 will be: SELECT * FROM Table1, Table2;</p> <table border="1"> <tr> <td>A</td> <td>B</td> <td>A</td> <td>C</td> <td>D</td> </tr> <tr> <td>1</td> <td>XYZ</td> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>1</td> <td>XYZ</td> <td>2</td> <td>C2</td> <td>20</td> </tr> <tr> <td>2</td> <td>PQR</td> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>PQR</td> <td>2</td> <td>C2</td> <td>20</td> </tr> </table>	Table1	Table2	<table border="1"> <tr> <th>A</th> <th>B</th> </tr> <tr> <td>1</td> <td>XYZ</td> </tr> <tr> <td>2</td> <td>PQR</td> </tr> </table>	A	B	1	XYZ	2	PQR	<table border="1"> <tr> <th>A</th> <th>C</th> <th>D</th> </tr> <tr> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>C2</td> <td>20</td> </tr> </table>	A	C	D	1	C1	10	2	C2	20	A	B	A	C	D	1	XYZ	1	C1	10	1	XYZ	2	C2	20	2	PQR	1	C1	10	2	PQR	2	C2	20	
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10	What is Natural Join? Explain with example?	2																																												
ANS	<p>A natural join is a type of join operation that creates an implicit join by combining tables based on columns with the same name and data type. Natural join automatically filters out records based on equality on common attribute(s) and eliminates duplicated common attribute(s) from the resultant table.</p> <p>Example</p> <table border="1"> <tr> <td style="text-align: center;">Table1</td> <td style="text-align: center;">Table2</td> </tr> <tr> <td> <table border="1"> <tr> <th>A</th> <th>B</th> </tr> <tr> <td>1</td> <td>XYZ</td> </tr> <tr> <td>2</td> <td>PQR</td> </tr> </table> </td> <td> <table border="1"> <tr> <th>A</th> <th>C</th> <th>D</th> </tr> <tr> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>C2</td> <td>20</td> </tr> </table> </td> </tr> </table> <p>Cartesian product of Table 1 and Table 2 will be:</p> <p>SELECT * FROM Table1 NATURAL JOIN Table2;</p> <table border="1"> <tr> <td>A</td> <td>B</td> <td>C</td> <td>D</td> </tr> <tr> <td>1</td> <td>XYZ</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>PQR</td> <td>C2</td> <td>20</td> </tr> </table>	Table1	Table2	<table border="1"> <tr> <th>A</th> <th>B</th> </tr> <tr> <td>1</td> <td>XYZ</td> </tr> <tr> <td>2</td> <td>PQR</td> </tr> </table>	A	B	1	XYZ	2	PQR	<table border="1"> <tr> <th>A</th> <th>C</th> <th>D</th> </tr> <tr> <td>1</td> <td>C1</td> <td>10</td> </tr> <tr> <td>2</td> <td>C2</td> <td>20</td> </tr> </table>	A	C	D	1	C1	10	2	C2	20	A	B	C	D	1	XYZ	C1	10	2	PQR	C2	20														
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11	What is EQUI JOIN? Explain with an example?	2																																												
ANS	<p>EQUI JOIN creates a JOIN for equality or matching column(s) values of the relative tables.</p> <p>Syntax :</p> <pre>SELECT column_list FROM table1, table2.... WHERE table1.column_name = table2.column_name;</pre>																																													
12	Consider following table and write output of the following queries:- ACCOUNT	4																																												
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113	RAJESH SHARMA	30000	CURRENT	AJMER
114	OMESH	20000	CURRENT	JAIPUR
115	RITIK GUPTA	70000	SAVING	KOTA

- A. SELECT SUM(BALANCE) FROM ACCOUNT;
- B. SELECT MAX(BALANCE), MIN(BALANCE) FROM ACCOUNT;
- C. SELECT COUNT(*) FROM ACCOUNT WHERE TYPE="SAVING";
- D. SELECT AVG(BALANCE) FROM ACCOUNT WHERE ACNO IN(111,113);

ANS	A. SUM(BALANCE) 195000	
	B. MAX(BALANCE)	MIN(BALANCE)
	70000	20000
	C. COUNT(*)	
	3	
	D. AVG(BALANCE)	
	40000	

13 Consider following table and write output of the following queries: -
ACCOUNT

ACNO	C_NAME	BALANCE	TYPE	BRANCH
111	KAMLESH KJMAR	50000	SAVING	JAIPUR
112	SANDEEP JAIN	25000	SAVING	UDAIPUR
113	RAJESH SHARMA	30000	CURRENT	AJMER
114	OMESH	20000	CURRENT	JAIPUR
115	RITIK GUPTA	70000	SAVING	KOTA

- a. SELECT TYPE, SUM(BALANCE) FROM ACCOUNT GROUP BY TYPE;
- b. SELECT TYPE,MAX(BALANCE), MIN(BALANCE) FROM ACCOUNT GROUP BY TYPE;
- c. SELECT BRANCH, COUNT(*) FROM ACCOUNT GROUP BY BRANCH HAVING COUNT(*)>1;
- d. SELECT TYPE FROM ACCOUNT GROUP BY TYPE HAVING AVG(BALANCE)>40000 ;

a.	TYPE	SUM(BALANCE)
	SAVING	145000
	CURRENT	50000
b.	TYPE	MAX(BALANCE) MIN(BALANCE)
	SAVING	70000 25000
	CURRENT	30000 20000
c.	BRANCH	COUNT(*)
	JAIPUR	2
d.	TYPE	
	SAVING	

14 Consider following tables and answer queries (i) to (iii) and write down output of (iv) : -
CUSTOMER

Cust_ID	CNAME	GENDER	CITY	CLUB_ID
C01	DEVESH	M	NEW DELHI	101
C02	SURAJ	M	JAIPUR	102
C03	SHEELA	F	UDAIPUR	102
C04	MEENAKSHI	F	JAIPUR	101
C04	AAKRITI	F	UDAIPUR	103

CLUB

CLUB_ID	CLUB_NAME	FEES
101	YOGA	800
102	MUSIC	1000
103	SPORTS	2000

- a. Display Customer name along with their respective club name.
- b. Show Customer name, customer id who have joined MUSIC Club.
- c. Display Customer name, gender and club name of all customers who live in JAIPUR.
- d. SELECT CNAME,CLUB_NAME FROM CUSTOMER,CLUB
WHERE CUSTOMER.CLUB_ID=CLUB.CLUB_ID and GENDER ="M";

ANS

- a. SELECT CNAME,CLUB_NAME FROM CUSTOMER,CLUB
WHERE CUSTOMER.CLUB_ID=CLUB.CLUB_ID;
- b. SELECT CUST_ID,CNAME FROM CUSTOMER,CLUB
WHERE CUSTOMER.CLUB_ID=CLUB.CLUB_ID and CLUB_NAME="MUSIC";
- c. SELECT CNAME,GENDER,CLUB_NAME FROM CUSTOMER,CLUB
WHERE CUSTOMER.CLUB_ID=CLUB.CLUB_ID and CITY="JAIPUR";
- d.

CNAME	CLUB_NAME
DEVESH	YOGA
SURAJ	MUSIC

15

Consider following tables and answer queries (i) to (iv)
SUPPLIER

SNO	SNAME	CITY
1	ABC Pvt	NEW DELHI
2	INDIA Enterprises	JAIPUR
3	Deep Ltd	UDAIPUR
4	G&G Corp	JAIPUR

ITEM

CODE	I_NAME	PRICE	SNO
C1	COLD DRINK	150	2
B2	BISCUITS	100	3
T3	TEA	200	1

- A. Display Item code and item name whose price is more than 100 in the descending order of price.
- B. Show Item name and their respective supplier name.
- C. Display Supplier no, supplier name who have supplied item which item code is B2.
- D. Lists Item name, price and supplier name of item which have been supplied by a supplier of JAIPUR.

ANS

- A. SELECT CODE,I_NAME FROM ITEM WHERE PRICE>100 ORDER BY PRICE DESC;
- B. SELECT I_NAME, SNAME
FROM SUPPLIER AS S, ITEM AS I
WHERE S.SNO=I.SNO;
- C. SELECT SNO, SNAME
FROM SUPPLIER AS S, ITEM AS I
WHERE S.SNO=I.SNO AND CODE="B2";
- D. SELECT I_NAME,PRICE, SNAME
FROM SUPPLIER AS S, ITEM AS I
WHERE S.SNO=I.SNO AND CITY="JAIPUR";

16

Consider following table and write query for question (i) to (iv): -

4

ACCOUNT				
ACNO	C_NAME	BALANCE	TYPE	BRANCH
111	KAMLESH KJMAR	50000	SAVING	JAIPUR
112	SANDEEP JAIN	25000	SAVING	UDAIPUR
113	RAJESH SHARMA	30000	CURRENT	AJMER
114	OMESH	20000	CURRENT	JAIPUR
115	RITIK GUPTA	70000	SAVING	KOTA

- (i) Display total balance of account table.
- (ii) Display average balance at JAIPUR branch.
- (iii) Display maximum balance and minimum balance of each branch.
- (iv) Display number of accounts of each type

ANS

- i) SELECT SUM(BALANCE) FROM ACCOUNT;
- ii) SELECT AVG(BALANCE) FROM ACCOUNT WHERE BRANCH="JAIPUR";
- iii) SELECT BRANCH, MAX(BALANCE), MIN(BALANCE) FROM ACCOUNT GROUP BY BRANCH;
- iv) SELECT TYPE,COUNT(*) FROM ACCOUNT GROUP BY TYPE;

17 Consider following table and write query for question (i) to (iv): -
CONTACTS

ID	NAME	CITY	STATE	MOBILE
111	KAMLESH KUMAR	MUMBAI	MAHARASHTRA	9858499341
112	SANDEEP JAIN	CHENNAI	TAMILNADU	9857683422
113	RAJESH SHARMA	KOLKATA	WEST BENGAL	9862345563
114	OMESH	CHENNAI	TAMILNADU	7658364654
115	RITIK GUPTA	MUMBAI	MAHARASHTRA	8734645335
116	GAGNESH	CHENNAI	TAMILNADU	9244535446
117	HARVINDER	CHANDIGARH	PUNJAB	7885500307

- A. Display total no. of contacts from TAMILNADU state.
- B. Display number of contacts from each city.
- C. Display details of contacts whose city is either starting from M or K
- D. Display name of state and total number of contacts where at least 2 contacts are there.

ANS

- A. SELECT COUNT(*) FROM CONTACTS WHERE STATE="TAMILNADU";
- B. SELECT CITY COUNT(*) FROM CONTACTS GROUP BY CITY;
- C. SELECT * FROM CONTACTS WHERE CITY LIKE "M%" or CITY LIKE "K%";
- D. SELECT STATE,COUNT(*) FROM CONTACTS GROUP BY STATE HAVING COUNT(*)>2;

18 Consider following tables and answer queries (i) to (iv): -
WORKER

WID	WNAME	JOB	SALARY	DNO
1001	RAHUL SHARMA	CLERK	15000	D03
1002	MUKESH VYAS	ELECTRICIAN	11000	D01
1003	SURESH	FITTER	9000	D02
1004	ANKUR	GUARD	8000	D01

DEPT

DNO	DNAME	LOCATION	MANAGER
D01	PRODUCTION	GROUND FLOOR	D K JAIN
D02	ACCOUNTS	1ST FLOOR	S ARORA
D03	SECURITY	1ST FLOOR	R K SINGH

- A. Display Worker ID, Name and Job who are working under D K JAIN
- B. Display Worker name and their respective department names who are working as

	<p>ELECTRICIAN.</p> <p>C. Display the average salary of workers who are working in the PRODUCTION department.</p> <p>D. Display Worker name, Job and their respective manager.</p>																																										
ANS	<p>A. SELECT WID, WNAME, JOB FROM WORKER NATURAL JOIN DEPT WHERE MANAGER="D K JAIN";</p> <p>B. SELECT WNAME, DNAME FROM WORKER NATURAL JOIN DEPT WHERE JOB="ELECTRICIAN";</p> <p>C. SELECT AVG(SALARY) FROM WORKER NATURAL JOIN DEPT WHERE DNAME="PRODUCTION";</p> <p>D. SELECT WNAME, JOB, MANAGER FROM WORKER W, DEPT W WHERE W.DNO=W.DNO;</p>																																										
19	<p>Consider following tables and answer queries (i) to (iv): -</p> <p style="text-align: center;">WORKER</p> <table border="1"> <thead> <tr> <th>WID</th><th>WNAME</th><th>JOB</th><th>SALARY</th><th>DNO</th></tr> </thead> <tbody> <tr> <td>1001</td><td>RAHUL SHARMA</td><td>CLERK</td><td>15000</td><td>D03</td></tr> <tr> <td>1002</td><td>MUKESH VYAS</td><td>ELECTRICIAN</td><td>11000</td><td>D01</td></tr> <tr> <td>1003</td><td>SURESH</td><td>FITTER</td><td>9000</td><td>D02</td></tr> <tr> <td>1004</td><td>ANKUR</td><td>GUARD</td><td>8000</td><td>D01</td></tr> </tbody> </table> <p style="text-align: center;">DEPT</p> <table border="1"> <thead> <tr> <th>DNO</th><th>DNAME</th><th>LOCATION</th><th>MANAGER</th></tr> </thead> <tbody> <tr> <td>D01</td><td>PRODUCTION</td><td>GROUND FLOOR</td><td>D K JAIN</td></tr> <tr> <td>D02</td><td>ACCOUNTS</td><td>1ST FLOOR</td><td>S ARORA</td></tr> <tr> <td>D03</td><td>SECURITY</td><td>1ST FLOOR</td><td>R K SINGH</td></tr> </tbody> </table> <p>A. Display the total salary of workers who are working as CLERK. B. Display Number of workers working in each department. C. Display Average, Highest salary of workers who are working in the departments located at 1ST FLOOR. D. Display WNAME, Annual Salary (assuming given salary is monthly), Department name whose department number is D01 or D03.</p>	WID	WNAME	JOB	SALARY	DNO	1001	RAHUL SHARMA	CLERK	15000	D03	1002	MUKESH VYAS	ELECTRICIAN	11000	D01	1003	SURESH	FITTER	9000	D02	1004	ANKUR	GUARD	8000	D01	DNO	DNAME	LOCATION	MANAGER	D01	PRODUCTION	GROUND FLOOR	D K JAIN	D02	ACCOUNTS	1ST FLOOR	S ARORA	D03	SECURITY	1ST FLOOR	R K SINGH	
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ANS	<p>A. SELECT SUM(SALARY) FROM WORKER WHERE JOB="CLERK";</p> <p>B. SELECT DNAME,COUNT(*) FROM WORKER NATURAL JOIN DEPT GROUP BY DNAME;</p> <p>C. SELECT AVG(SALARY), MAX(SALARY)FROM WORKER NATURAL JOIN DEPT WHERE LOCATION="1ST FLOOR";</p> <p>D. SELECT WNAME,SALARY*12 AS "ANNUAL SALARY", DNAME FROM WORKER NATURAL JOIN DEPT WHERE DNO IN ("D01","D03");</p>																																										
20	<p>Answer the following questions based on table CUSTOMER and ORDER.</p> <p style="text-align: center;">CUSTOMER:</p> <table border="1"> <thead> <tr> <th>ID</th><th>NAME</th><th>AGE</th><th>ADDRESS</th><th>SALARY</th></tr> </thead> <tbody> <tr> <td>1</td><td>RAMESH</td><td>32</td><td>DELHI</td><td>2000</td></tr> <tr> <td>2</td><td>SURESH</td><td>25</td><td>KOTA</td><td>1500</td></tr> <tr> <td>3</td><td>HARDIK</td><td>27</td><td>BHOPAL</td><td>6500</td></tr> <tr> <td>4</td><td>RAVI</td><td>33</td><td>MP</td><td>8500</td></tr> </tbody> </table> <p style="text-align: center;">ORDER:</p> <table border="1"> <thead> <tr> <th>ORDER_ID</th><th>ORDER_DATE</th><th>CUSTOMER_ID</th><th>AMOUNT</th></tr> </thead> <tbody> <tr> <td>101</td><td>12/11/1990</td><td>2</td><td>100</td></tr> <tr> <td>102</td><td>1/2/2000</td><td>3</td><td>200</td></tr> </tbody> </table>	ID	NAME	AGE	ADDRESS	SALARY	1	RAMESH	32	DELHI	2000	2	SURESH	25	KOTA	1500	3	HARDIK	27	BHOPAL	6500	4	RAVI	33	MP	8500	ORDER_ID	ORDER_DATE	CUSTOMER_ID	AMOUNT	101	12/11/1990	2	100	102	1/2/2000	3	200	3				
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<p>A. Identify foreign key in above tables with suitable explanation. B. What will be the degree and cardinality of the resultant table after the cartesian product of the table customer and order . C. What will be the cardinality of table customer after removal of column salary.</p>																																
Ans	<p>A. CUSTOMER:NO FOREIGN KEY ORDER:CUSTOMER_ID Explanation: (i)values of column CUSTOMER_ID are from the domain of primary key ID from CUSTOMER table. (ii)Its a non-key attribute.</p> <p>B. Degree=9 Cardinality=16</p> <p>C. Cardinality=4</p>																															
21	<p style="text-align: center;">CUSTOMER:</p> <table border="1"> <thead> <tr> <th>ID</th> <th>NAME</th> <th>AGE</th> <th>CITY</th> <th>SALARY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RAMESH</td> <td>32</td> <td>DELHI</td> <td>2000</td> </tr> <tr> <td>2</td> <td>SURESH</td> <td>25</td> <td>KOTA</td> <td>1500</td> </tr> <tr> <td>3</td> <td>HARDIK</td> <td>27</td> <td>BHOPAL</td> <td>6500</td> </tr> <tr> <td>4</td> <td>RAVI</td> <td>33</td> <td>MP</td> <td>NULL</td> </tr> <tr> <td>5</td> <td>HARISH</td> <td>24</td> <td>KOTA</td> <td>1000</td> </tr> </tbody> </table> <p>A. Display the sum of all salary of those customers having age above 22. B. Display maximum and minimum salary from customer table. C. Display the count of all customers whose city is Delhi. D. Write Output of the following Queries: Select avg(SALARY) from ORDER;</p>	ID	NAME	AGE	CITY	SALARY	1	RAMESH	32	DELHI	2000	2	SURESH	25	KOTA	1500	3	HARDIK	27	BHOPAL	6500	4	RAVI	33	MP	NULL	5	HARISH	24	KOTA	1000	4
ID	NAME	AGE	CITY	SALARY																												
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3	HARDIK	27	BHOPAL	6500																												
4	RAVI	33	MP	NULL																												
5	HARISH	24	KOTA	1000																												
Ans	<p>A. SELECT SUM(SALARY) FROM CUSTOMER WHERE AGE>22; B. SELECT MAX(SALARY),MIN(SALARY) FROM CUSTOMER; C. SELECT CITY,COUNT (*) FROM CUSTOMER GROUP BY CITY HAVING CITY="DELHI"; D. Output:</p> <table border="1"> <tr> <td>avg(SALARY)</td> </tr> <tr> <td>2750.0000</td> </tr> </table>	avg(SALARY)	2750.0000																													
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2750.0000																																
22	<p>Mr. Suresh wants to display average salary of each city. He entered the following SQL statement. Identify error(s) and rewrite the correct SQL statement. SELECT CITY, SALARY FROM CUSTOMER GROUP BY CITY;</p>	1																														
Ans	<p>Incorrect Query: SELECT CITY, <u>SALARY</u> FROM CUSTOMER GROUP BY CITY; Correct Query: SELECT CITY, AVG (SALARY) FROM CUSTOMER GROUP BY CITY;</p>																															
23	<p>Consider the following table FURNITURE.Write output produced by the following queries: Table: FURNITURE</p> <table border="1"> <thead> <tr> <th>FID</th> <th>NAME</th> <th>DATEOFPURCHASE</th> <th>COST</th> <th>DISCOUNT</th> </tr> </thead> <tbody> <tr> <td>B001</td> <td>Double Bed</td> <td>03-Jan-2018</td> <td>45000</td> <td>10</td> </tr> <tr> <td>T010</td> <td>Dining Table</td> <td>10-Mar-2020</td> <td>51000</td> <td>5</td> </tr> <tr> <td>B004</td> <td>Single Bed</td> <td>19-Jul-2021</td> <td>22000</td> <td>0</td> </tr> </tbody> </table>	FID	NAME	DATEOFPURCHASE	COST	DISCOUNT	B001	Double Bed	03-Jan-2018	45000	10	T010	Dining Table	10-Mar-2020	51000	5	B004	Single Bed	19-Jul-2021	22000	0	4										
FID	NAME	DATEOFPURCHASE	COST	DISCOUNT																												
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T010	Dining Table	10-Mar-2020	51000	5																												
B004	Single Bed	19-Jul-2021	22000	0																												

C003	Long Back Chair	30-Dec-2016	12000	3
T006	Console Table	17-Nov-2021	15000	12
B006	Bunk Bed	01-Jan-2021	28000	14

- (a) SELECT SUM(DISCOUNT) FROM FURNITURE WHERE COST>15000;
 (b) SELECT MAX(DATEOFPURCHASE) FROM FURNITURE;
 (c) SELECT * FROM FURNITURE WHERE DISCOUNT>5 AND FID LIKE "T%";
 (d)SELECT NAME ,DISCOUNT FROM FURNITURE WHERE COST BETWEEN 21000 AND 30000;

Ans

- (a)29
 (b)19-Jul-2021
 (c)

T006	Console Table	17-Nov-2019	15000	12
------	---------------	-------------	-------	----

(d)

NAME	DISCOUNT
Single Bed	0
Bunk Bed	14

24 Consider the following table EMPLOYEE and DEPARTMENT. Write output produced by the following queries:

Table: EMPLOYEE

EMPID	NAME	DOB	DEPTID	DESIG	SALARY
120	Alisha	23-Jan-1978	D001	Manager	75000
123	Nitin	10-Oct-1977	D002	AO	59000
129	Navjot	12-Jul-1971	D003	Supervisor	40000
130	Jimmy	30-Dec-1980	D004	Sales Rep	10000
131	Faiz	06-Apr-1984	D001	Dep Manager	65000

Table: DEPARTMENT

DEPTID	DEPTNAME	FLOORNO
D001	Personal	4
D002	Admin	10
D003	Production	1
D004	Sales	3

- (a) SELECT AVG(SALARY) FROM EMPLOYEE GROUP BY DEPTID;
 (b) SELECT NAME, DEPTNAME FROM EMPLOYEE, DEPARTMENT WHERE EMPLOYEE.DEPTID= DEPARTMENT.DEPTID AND SALARY>50000;
 (c) SELECT NAME FROM EMPLOYEE WHERE SALARY IN(59000,40000,65000) ORDER BY NAME;
 (d) SELECT EMPID FROM EMPLOYEE WHERE NAME LIKE'____';

Ans

(a)
AVG(SALARY)

70000.0000

(c)
NAME

Navjot

59000.0000
40000.0000
10000.0000

Nitin
Faiz

(b)	
NAME	DEPARTMENT
Alisha	Personal
Faiz	Personal
Nitin	Admin

(d)	
EMPID	
123	
130	

25 Write queries (a) to (d) based on the tables TEACHER and STUDENT given below:
Table: TEACHER

TEACHERID	NAME	DOB	STUDID	DESIG	SALARY
101	Rana	3-Feb-1989	1	Pgt	5000
102	Ramesh	8-Sep-1980	2	Prt	9000
103	Narayan	19-Jan-1999	3	Tgt	80000
104	Swati	30-Dec-1980	4	Prt	
105	Preeti	06-Apr-1984	1	Pgt	65000

Table: STUDENT

STUDID	STREAM	HOUSENO
1	Science	115
2	Arts	120
3	Commerce	18
4	Home Science	30

- (a) To display the average salary of all teachers , designation wise.
- (b) To display the name and respective stream name of each teacher whose salary is more than 65000.
- (c) To display the names of teachers whose salary is not known, in alphabetical order.
- (d) To display student id from the table TEACHER without repetition.

Ans

- (a) SELECT AVG(SALARY) FROM TEACHER GROUP BY DESIG;
- (b) SELECT NAME, STREAM FROM TEACHER,STUDENT WHERE TEACHER.STUDID= STUDENT.STUDID AND SALARY>65000;
- (c) SELECT NAME FROM TEACHER WHERE SALARY IS NULL ORDER BY NAME;
- (d) SELECT DISTINCT STUDID FROM TEACHER;

26 Write queries (a) to (d) based on the tables CUSTOMER and ORDER given below:
TABLE:CUSTOMER

CUSTOMERID	CUSTOMERNAME	CITY	COUNTRY
101	AMAN	JAIPUR	INDIA
102	SURESH	BARANG	GERMANY
103	ANAND	RODIX	MEXICO

104	RISHABH	TENDA	GERMANY
105	AARYAN	KOTA	INDIA

TABLE:ORDER

ORDERID	CUSTOMERID	ORDERDATE
1	101	12/5/2016
2	102	3/8/1990
3	101	21/9/2020

- (a) To display customer name with their order id.
- (b) To display total number of customers countrywise.
- (c) To display customer name who have made order in ascending order .
- (d) To display total number of customers whose city name start with "J".

Ans	(a) SELECT CUSTOMERNAME,ORDERID FROM CUSTOMER,ORDER WHERE CUSTOMER.CUSTOMERID=ORDER.CUSTOMERID; (b) SELECT COUNTRY,COUNT(*) FROM CUSTOMER GROUP BY COUNTRY; (c) SELECT CUSTOMERNAME FROM CUSTOMER,ORDER WHERE CUSTOMER.CUSTOMERID=ORDER.CUSTOMERID ORDER BY CUSTOMERNAME; (d) SELECT COUNT(*) FROM CUSTOMER WHERE CITY LIKE "J%";
-----	--

VNO	COMPANY	MODEL	MAKE	PRICE
RJ06AB1234	MARUTI SUZUKI	BALENO	2018	8.5
RJ27CD5243	HONDA	AMAZE	2015	9.5
RJ27BK3245	MARUTI SUZUKI	ALTO K10	2021	4.3
RJ14AJ0053	HONDA	JAZZ	2020	5.5
RJ30KA2364	TATA	TIAGO	2020	4.8

TABLE:OWNER

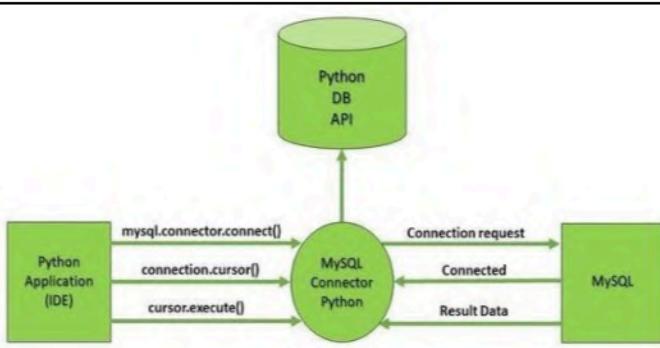
ID	OWNER_NAME	AGE	CITY	VNO
101	HARSH SINGH	35	JODHPUR	RJ14AJ0053
102	ANMOL SAINI	40	KOTA	RJ30KA2364
103	RAJAT SHARMA	45	ALWAR	RJ06AB1234
104	RITIKA SINHA	30	BIKANER	RJ27CD5243
105	MONIKA	25	BHILWARA	RJ27BK3245

- A. To display details of vehicles of MARUTI SUZUKI in the ascending order of price.
- B. To display maximum price of each year of make.
- C. To display vehicle number, Owner name and model of vehicles.
- D. Display average age of owners who are the owners of MARUTI SUZUKI.

ANS	A. SELECT * FROM VEHICLE WHERE COMPANY="MARUTI SUZUKI" ORDER BY PRICE; B. SELECT MAKE, MAX(PRICE) FROM VEHICLE GROUP BY MAKE; C. SELECT VNO,OWNER_NAME,MODEL FROM VEHICLE AS V ,OWNER AS O WHERE V.VNO=O.VNO; D. SELECT AVG(AGE) FROM VEHICLE AS V ,OWNER AS O WHERE V.VNO=O.VNO AND COMPANY="MARUTI SUZUKI";
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TOPIC:Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

Q. NO	QUESTIONS WITH ANSWER	MARKS
1	What is the Database Connector?	1
ANS	A database connector is a software that connects an application to any database.	



2	Write the command to install the mysql-connectors module for python.	1
ANS	pip install mysql-connector	
3	Which function is used to check the successful connection?	1
ANS	is_connected() method	
4	Write python code to connect with the database named "XIICS".	2
ANS	<pre>import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') myconn.close()</pre>	
5	What is a cursor? Explain how to initiate the same.	2
ANS	<p>A cursor is an object which helps to execute the query and fetch the records from the database.</p> <pre>import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') mycursor = myconn.cursor() mycursor.execute("MySQL Command") myconn.close()</pre>	
6	What are the multiple ways to retrieve data?	2
	<p>Data can be fetched from MYSQL using the fetch() method provided by the mysql-connector-python. The cursor provides three methods namely fetchall(), fetchmany() and fetchone().</p> <ul style="list-style-type: none"> The fetchone() method fetches the next row in the result of a query and returns it as a tuple. The fetchall() method retrieves all the rows in the result set of a query and returns them as a list of tuples. (If we execute this after retrieving a few rows it returns the remaining ones). The fetchmany() method is similar to the fetchone() but it retrieves the next set of rows in the result set of a query, instead of a single row. 	
7	Which method is used to insert multiple records into a table?	1
ANS	executemany() method	
8	What is the result set?	1
ANS	A ResultSet is a table of data returned by the .execute() method, containing a list of tuples of query results, which is usually generated by executing a statement that queries the database. The object of ResultSet maintains a cursor pointing to a row of a table.	

9	Write a python database connectivity script to create a Database named “XIICS” and a Table named “Student”. <pre>import mysql.connector try: myconn = mysql.connector.connect (host='localhost', user='root', password='root') mycursor = myconn.cursor() mycursor.execute('CREATE DATABASE IF NOT EXISTS XIICS') mycursor.execute('USE XIICS') mycursor.execute(""" CREATE TABLE IF NOT EXISTS Student (rollNo INT PRIMARY KEY, firstName VARCHAR(15) NOT NULL, lastName VARCHAR(15) NOT NULL, class INT NOT NULL, city VARCHAR(20)); """) myconn.commit() myconn.close() print("Database and Table created successfully") except: print("Error! Unable to create database and table. Please try again later.")</pre>	2
10	Write python commands to display data by using fetchone() and fetchall()	2
ANS	#fetchone() <pre>import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('SELECT rollNo, firstName, lastName FROM Student WHERE rollNo = %s', (rollNo,)) record = list(mycursor.fetchone()) print(str(record[0]) + " " + str(record[1]) + " " + str(record[2])) myconn.close()</pre> #fetchall() <pre>import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('SELECT rollNo, firstName, lastName FROM Student WHERE rollNo = %s', (rollNo,)) records = list(mycursor.fetchall()) for record in records: print(str(record[0]) + " " + str(record[1]) + " " + str(record[2])) myconn.close()</pre>	
11	Write a python database connectivity script to insert a student record in the “Student” table. Data should be read from the user at run time.	2

ANS	<pre> import mysql.connector stuList = [] stuList.append(input('Enter Student Roll No.: ')) stuList.append(input('Enter First Name: ')) stuList.append(input('Enter Last Name: ')) stuList.append(input('Enter Class: ')) stuList.append(input('Enter City: ')) try: myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') mycursor = myconn.cursor() mycursor.execute('INSERT INTO Student (rollNo, firstName, lastName, class, city) VALUES (%s, %s, %s, %s, %s)', stuList) myconn.commit() myconn.close() print("Student with student roll no. "+stuList[0]+" added successfully") except Exception: print("Error! Unable to add the student. Please try again") </pre>	
12	Write a python database connectivity script to update the first name of the student having roll no. as 101 in the "Student" table.	2
ANS	<pre> import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() mycursor.execute('UPDATE Student SET firstName = "Bhagat" WHERE rollNo = %s', (rollNo,)) print("No. of rows affected:", mycursor.rowcount) myconn.commit() myconn.close() </pre>	
13	Write a python database connectivity script that deletes records from "Student" table having second character of Surname as "u"	2
ANS	<pre> import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') mycursor = myconn.cursor() mycursor.execute('DELETE FROM Student WHERE Surname LIKE %s', ("_u%",)) myconn.commit() myconn.close() </pre>	
14	Explain rowCount() function with the help of an example.	2
ANS	<pre> import mysql.connector myconn = mysql.connector.connect (host='localhost', user='root', password='root', database='XIICS') rollNo = 101 mycursor = myconn.cursor() </pre>	

	mycursor.execute('SELECT rollNo, firstName, lastName FROM Student WHERE rollNo = %s', (rollNo,)) records = list(mycursor.fetchall()) print("No. of rows affected:", mycursor.rowcount) myconn.close()	
15	How to close the database connection?	1
ANS	myconn.close()	
16	Which function of the mysql connector module is used to create a connection between a python program and a mysql database?	1
ANS	The connect() function	
17	What arguments are passed to the function of the mysql connector module which is used to create a connection between a python program and a mysql database?	2
ANS	The connect() function accepts four required arguments: <ul style="list-style-type: none">● host - server-name/IP of the machine on which mysql is running● user - instance username of the mysql database● passwd - instance password of the mysql database● database - name of the database	
18	Which method/function of the mysql connector module is used to make the changes permanent in the database?	1
ANS	commit() function	
19	Which method/function of the mysql connector module fetches all the records from the cursor object?	1
ANS	cursor.fetchall()	
20	Which method/function of the mysql connector module fetches only one record from the cursor object?	1
ANS	cursor.fetchone()	
21	Which method/function of the mysql connector module fetches a specific number of records from the cursor object?	1
ANS	cursor.fetchmany(num) ; this function fetches the records as specified by the 'num' argument	
22	What is the return type of the is_connected() function?	1
ANS	Boolean	
23	A resultset is extracted from the database using a cursor object by giving the following statement: data = cursor.fetchmany(5) a. How many records will be returned by the fetchmany() function/method? b. What is the datatype of 'data' after the execution of the above statement?	2
ANS	a. Five records (Please note that the fetchmany() function fetches all the records if the number of records fetched from the database are less than the number of records specified by the argument of fetchmany() function). b. List	
24	A resultset is extracted from the database using a cursor object by giving the following statement: data = cursor.fetchone() a. What is the datatype of 'data' after the execution of the above statement if one record was returned from the database? b. What is the datatype of 'data' after the execution of the above statement if no record was returned from the database?	2
ANS	a. Tuple b.None	
25	A resultset is extracted from the database using a cursor object by giving the following statement: data = cursor.fetchall() a. How many records will be returned by the fetchall() function/method if 10 records	2

	were returned from the database? b. What is the datatype of 'data' after the execution of the above statement?	
ANS	a. 10 records b. List	
26	A resultset is extracted from the database using a cursor object by giving the following statement: <code>data = cursor.fetchall()</code> a. How many records will be returned by the <code>fetchall()</code> function/method if no record was returned from the database? b. What is the length of 'data' after the execution of the above statement?	2
ANS	a. Zero b. Empty List hence the length is zero	
27	A resultset is extracted from the database using a cursor object by giving the following statement: <code>data = cursor.fetchmany(5)</code> a. How many records will be returned by the <code>fetchmany()</code> function/method if 3 records were returned from the database? b. What is the datatype of 'data' after the execution of the above statement?	2
ANS	a. 3 records b. List containing three tuples	
28	A resultset is extracted from the database using a cursor object by giving the following statement: <code>data = cursor.fetchmany(5)</code> How many records will be returned by the <code>fetchmany()</code> function/method if 10 records were returned from the database? What is the datatype of 'data' after the execution of the above statement?	2
ANS	a. 5 records b. List containing 5 tuples	