BHARTIYA SKILL DEVELOPMENT UNIVERSITY

(A)

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: ITN 1101 **Time: 1 Hour**

Course Name: Introduction to Computer **Max. Marks: 20**

Instruction: (if any)

Section – A

05X01 = 05 Marks

1. What is true about supercomputers_____.

A) they can fit on a single small chip

B) they are found at thousands of places around the world

C) they cost only few thousand rupee

D) they can process billions of operations in a second

2. The heart of a computer is_____.

A) CPU

B) Memory

C) I/O Unit

D) Disks

3. A computer consists of_____.

A) A central processing unit

B) A memory

C) Input and output units

D) All the above

4. Which of the following is not used as secondary storage?

A) semiconductor memory

B) magnetic disks

C) magnetic drums

D) magnetic tapes

5. Which of the following is responsible for coordinating various operations using timing signals?

A) Arithmetic-logic unit

B) Control unit

C) Memory unit

D) I/O unit

Section – B

03X02 = 06 Marks

1. What is the Personal Computer?
2. What is MS-Dos?
3. What is Computer Virus?

Section – C

03X03 = 09 Marks

1. Explain the various Advantages of computers in detail.
2. Explain the various secondary storage devices in detail.
3. What is the difference between Supercomputer and Mainframe Computer?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, 1st Semester,

1st In-Sem. Examination

Course Code: ITN1101 **Time: 1 Hour**

Course Name: Introduction to Computer **Max. Marks: 20**

Instruction: (if any)

Section – A

05X01 = 05 Marks

Q1. What is true about supercomputers _____.

A) they can fit on a single small chip

B) they are found at thousands of places around the world

C) they cost only few thousand rupee

D) they can process billions of operations in a second

ANSWER: D

Q2. The heart of a computer is _____.

A) CPU

B) Memory

C) I/O Unit

D) Disks

ANSWER: A

Q3. A computer consists of _____.

A) A central processing unit

B) A memory

C) Input and output units

D) All the above

ANSWER: D

Q4. Which of the following is not used as secondary storage?

A) semiconductor memory

B) magnetic disks

C) magnetic drums

D) magnetic tapes

ANSWER: A

Q5. Which of the following is responsible for coordinating various operations using timing signals?

A) Arithmetic-logic unit

B) Control unit

C) Memory unit

D) I/O unit

ANSWER: B

Section – B

03X02 = 06 Marks

Q1. What is the Personal Computer?

ANS: The definition of a personal computer is a small computer with a microprocessor, designed for use by an individual. An example of personal computers are desktop computers used in homes, schools and small businesses.

Q2. What is MS-Dos?

ANS: Microsoft Disk Operating System, MS-DOSis a non-graphical command line operating system derived from 86-DOS that was created for IBM compatible computers. MS-DOS was originally written by Tim Paterson and introduced by Microsoft in August 1981 and was last updated in 1994 when MS-DOS 6.22 was released.

Q3. What is a Computer Virus?

ANS: A computer virus is a type of malicious code or program written to alter the way a computer operates and is designed to spread from one computer to another. A virus operates by inserting or attaching itself to a legitimate program or document that supports macros in order to execute its code. In the process, a virus has the potential to cause unexpected or damaging effects, such as harming the system software by corrupting or destroying data.

Section – C

03X03 = 09 Marks

Q1. Explain the various Advantages of computers in detail.

ANS: Advantages of Computers:

1.Speed: The speed of a computer is measured in terms of the number of instructions that it can perform or execute in a second. The speeds of computers are measured in milliseconds (10~3 sec), micro-seconds (10*6 sec), and nano-seconds (10~9sec).

2. Accuracy: Computers are very accurate. They are capable of executing hundreds Of instructions without any errors. They do not make mistakes in their computations. They perform each and every calculation with the same accuracy.

3. Storage Capability: Computers are capable of storing large amounts of data in their storage devices. These devices occupy very less space and can store millions of characters in condensed forms.

Q2. Explain the various secondary storage devices in detail.

ANS: A secondary storage device refers to any non-volatile storage device that is internal or external to the computer. It can be any storage device beyond the primary storage that enables permanent data storage. Although many forms of backup storage such as tape drives and floppy diskettes have been long abandoned, secondary storage devices include:

- Solid-state drives (SSDs).
- Hard disk drives (HDDs).
- Cloud storage.
- CD-ROM drives.
- DVD drives.
- Blu-ray drives.
- USB flash drives.
- SD cards.
- Floppy diskette

Q3. What is the difference between Supercomputer and Mainframe Computer?

ANS:

SUPERCOMPUTER	MAINFRAME COMPUTER
Supercomputers are used for large and complex mathematical computations.	While Mainframe computers are used as a storage for large database and serve as a maximum number of users simultaneously.
Supercomputer's speed is more than Mainframe computers. It can execute billions of instructions within a second.	Mainframe computer's speed is comparatively less than Supercomputers. In this millions of instructions are executed simultaneously.
Supercomputers are the largest computers.	Mainframe computers are smaller than supercomputers in size.
Supercomputers are the most costly in the world.	Mainframe computers are less costly than supercomputers.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

(A) 13

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I Semester,

1st In-Sem. Examination

Course Code: ITN1104 **Time: 1 Hour**

Course Name: Basics of Networking **Max. Marks: 20**

Section – A

05X01 = 05 Marks

05 objective type questions, each question carries 01 mark.

1. Two devices are in network if
   A) a process is running on both devices
   B) PIDs of the processes running of different devices are same
   C) a process in one device is able to exchange information with a process in another device
   D) none of the mentioned

2. A _____ is a device that forwards packets between networks by processing the routing information included in the packet.
   A) bridge B) router
   C) firewall D) all of the mentioned

3. A set of rules that governs data communication
   A) Standards B) RFCs
   C) Protocols D) None of the mentioned

4. Which network topology requires a central controller or hub?
   A) Mesh B) Ring
   C) Star D) Bus

5. The network layer protocol for internet is _____
   A) Ethernet B) hypertext transfer protocol
   C) file transfer protocol D) internet protocol
   Answer: C

Section – B

03X02 = 06 Marks

03 short answer type questions, each question carries 02 marks.

1. What are the four fundamental characteristics of effective data communication systems?
2. Explain different LAN technologies.
3. Explain different types of computer network components.

Section – C

03X03 = 09 Marks

03 essay type questions, each question carries 03 marks.

1. Discuss various advantages and disadvantages of each network topology.
2. Explain the following: -
   a) PAN
   b) LAN
   c) Internetwork
3. What is the difference between TCP and UDP protocols?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

B. Voc. Program, I Semester,

1st In-Sem. Examination

Course Code: ITN1104 **Time: 1 Hour**

Course Name: Basics of Networking **Max. Marks: 20**

Section – A

05X01 = 05 Marks

05 objective type questions, each question carries 01 mark.

1. Two devices are in network if
   A) a process is running on both devices
   B) PIDs of the processes running of different devices are same
   C) a process in one device is able to exchange information with a process in another device
   D) none of the mentioned

Answer: C

2. A _____ is a device that forwards packets between networks by processing the routing information included in the packet.
   A) bridge
   B) router
   C) firewall
   D) all of the mentioned

Answer: B

3. A set of rules that governs data communication
   A) Standards
   B) RFCs
   C) Protocols
   D) None of the mentioned

Answer: C

4. Which network topology requires a central controller or hub?
   A) Mesh
   B) Ring
   C) Star
   D) Bus

Answer: C

5. The network layer protocol for internet is _____
   A) Ethernet
   B) hypertext transfer protocol
   C) file transfer protocol
   D) internet protocol

Answer: C

Section – B

03X02 = 06 Marks

03 short answer type questions, each question carries 02 marks.

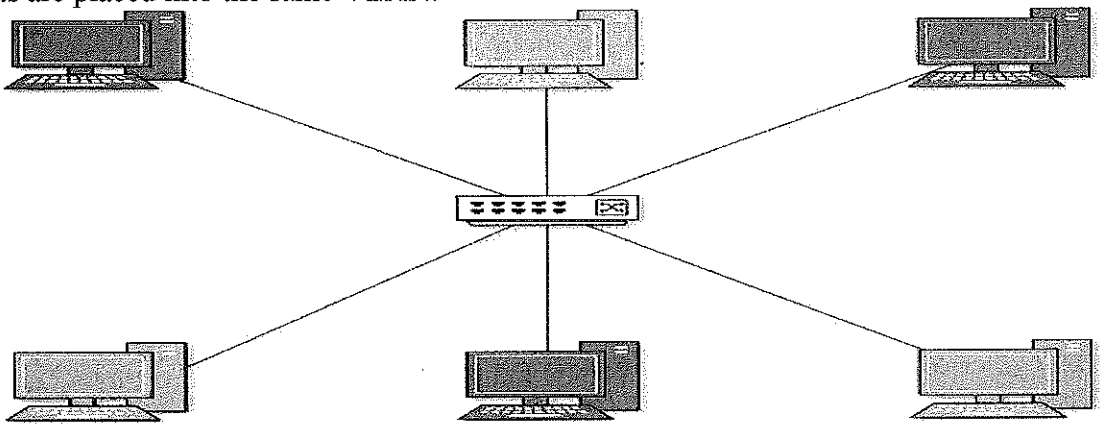
1. What are the four fundamental characteristics of effective data communication systems?

Ans. The effectiveness of data communications system depends on four fundamental characteristics:

Delivery: The system must deliver data to the correct destination. Data must be received by the intended device or user and only by that device or user.

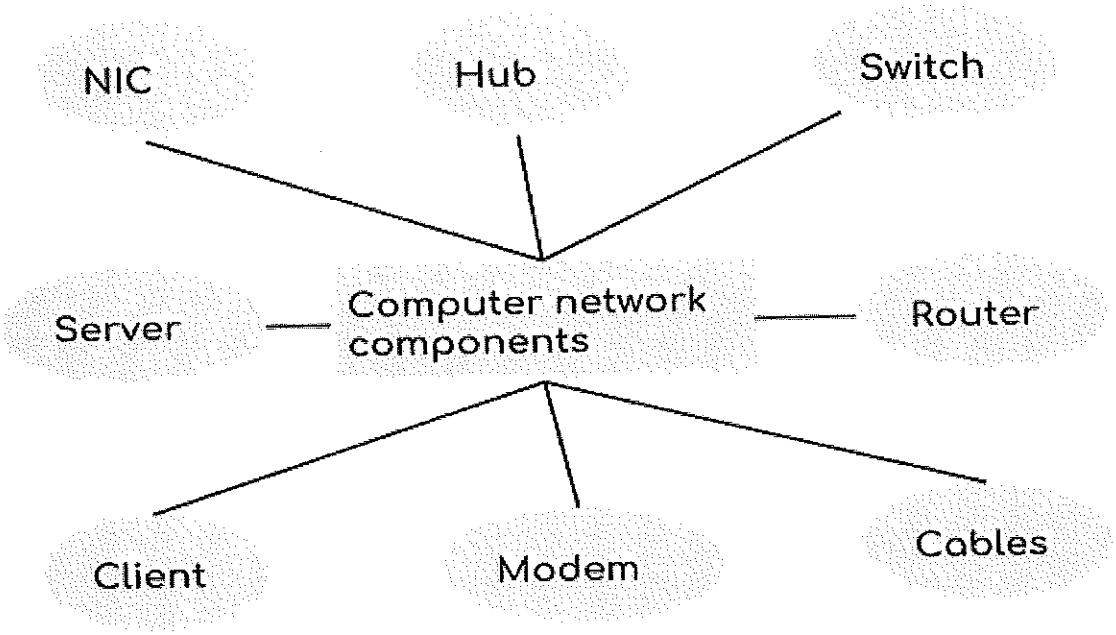
Accuracy: The system must deliver the data accurately. Data that have been altered in transmission and left uncorrected are unusable.
Timeliness: The system must deliver data in a timely manner. Data delivered late are useless. In the case of video and audio, timely delivery means delivering data as they are produced, in the same order that they are produced, and without significant delay. This kind of delivery is called real-time transmission.
Jitter: Jitter refers to the variation in the packet arrival time. It is the uneven delay in the delivery of audio or video packets. For example, let us assume that video packets are sent every 3D-ms. If some of the packets arrive with 3D-ms delay and others with 4D-ms delay, an uneven quality in the video is the result.

2. Explain different LAN technologies.
Ans. Let us go through various LAN technologies in brief:
Ethernet: Ethernet is a widely deployed LAN technology. Ethernet connector is, Network Interface Card (NIC) equipped with 48-bits MAC address. This helps other Ethernet devices to identify and communicate with remote devices in Ethernet. Traditional Ethernet uses 10BASE-T specifications. 10BASE-T Ethernet provides transmission speed up to 10MBPS and uses coaxial cable or Cat-5 twisted pair cable with RJ-45 connector. Ethernet follows star topology with segment length up to 100 meters.
Fast-Ethernet: To encompass need of fast emerging software and hardware technologies, Ethernet extends itself as Fast-Ethernet. It can run on UTP, Optical Fiber, and wirelessly too. It can provide speed up to 100 MBPS. Fast Ethernet on fiber is defined under 100BASE-FX standard which provides speed up to 100 MBPS on fiber. Ethernet over fiber can be extended up to 100 meters in half-duplex mode and can reach maximum of 2000 meters in full-duplex over multimode fibers.
Giga-Ethernet: Giga-Ethernet provides speed up to 1000 mbits/seconds. IEEE802.3ab standardize Giga-Ethernet over UTP using Cat-5, Cat-5e and Cat-6 cables. IEEE802.3ah defines Giga-Ethernet over Fiber.
Virtual LAN: Virtual LAN is a solution to divide a single Broadcast domain into multiple Broadcast domains. Host in one VLAN cannot speak to a host in another. By default, all hosts are placed into the same VLAN.



In the above diagram, different VLANs are depicted in different color codes. Hosts in one VLAN, even if connected on the same Switch cannot see or speak to other hosts in different VLANs. VLAN is Layer-2 technology which works closely on Ethernet. To route packets between two different VLANs a Layer-3 device such as Router is required.

3. Explain different types of computer network components.
Ans. A computer network is build up from several components. These components together make it possible to transfer data from one device to another and makes smooth communication between two different devices. Following are the major components required to install a network:



Server: Servers are computers that runs operating system and hold data that can be shared over a computer network.
Client: A client is a computer that is connected to other computers in the network and can receive data sent by other computers.
NIC: NIC stands for network interface card. NIC is a hardware component used to connect a computer with another computer onto a network.
Hub: A Hub is a hardware device that divides the network connection among multiple devices.
Switch: A switch is a hardware device that connects multiple devices on a computer network. A Switch contains more advanced features than Hub.
Router: A router is a hardware device which is used to connect a LAN with an internet connection. It is used to receive, analyze and forward the incoming packets to another network. A router works in a **Layer 3 (Network layer)** of the OSI Reference model.
Modem: A modem is a hardware device that allows the computer to connect to the internet over the existing telephone line.
Cables and Connectors: Cable is a transmission media used for transmitting a signal.
LAN cable: A wire that is used to connect more than one computers or other devices such as printers and scanner to each other.

Section – C

03X03 = 09 Marks

03 essay type questions, each question carries 03 marks.

1. Discuss various advantages and disadvantages of each network topology.
Ans. Network Topology is the schematic description of a network arrangement, connecting various nodes (sender and receiver) through lines of connection. There are some advantages and disadvantages of network topologies

Point-to-Point
Point-to-point networks contains exactly two hosts such as computer, switches or routers, servers connected back to back using a single piece of cable. Often, the receiving end of one host is connected to sending end of the other and vice-versa. If the hosts are connected point-to-point logically, then may have multiple intermediate devices. But the end hosts are unaware of underlying network and see each other as if they are connected directly.

Bus Topology
In Bus topology, all devices share single communication line or cable.
Advantages of bus topology:

- If N devices are connected to each other in bus topology, then the number of cables required to connect them is 1, which is known as backbone cable and N drop lines are required.
- Cost of the cable is less as compared to other topology, but it is used to build small networks.
- It is easy to understand and easy to expand joining two cables together.

Disadvantages of bus topology:

- If the common cable fails, then the whole system will crash down.
- If the network traffic is heavy, it increases collisions in the network.

Star Topology

In Star topology, devices connected using a point-to-point connection.

Advantages of star topology:

- If N devices are connected to each other in star topology, then the number of cables required to connect them is N. So, it is easy to set up.
- Fast performance with few nodes and low network traffic.
- Hub can be upgraded easily.
- Easy to troubleshoot.
- Only that node is affected which has failed, rest of the nodes can work smoothly.

Disadvantages of star topology:

- Cost of installation is high.
- Performance is based on the single concentrator i.e. hub.
- If the hub fails, then the whole network is stopped because all the nodes depend on the hub.

Ring Topology

In ring topology, each host machine connects to exactly two other machines, creating a circular network structure.

Advantages of ring topology:

- The possibility of collision is minimum in this type of topology.
- Cheap to install and expand.
- Transmitting network is not affected by high traffic or by adding more nodes, as only the nodes having tokens can transmit data.
- Cheap to install and expand

Disadvantages of ring topology:

- Troubleshooting is difficult in this topology.
- Addition of stations in between or removal of stations can disturb the whole topology.
- Failure of one computer disturbs the whole network.

Mesh Topology

In this type of topology, a host is connected to one or multiple hosts.

Advantages of mesh topology:

- Fault is diagnosed easily. Data is reliable because data is transferred among the devices through dedicated channels or links.
- Provides security and privacy.
- Each connection can carry its own data load.

Disadvantages of mesh topology:

- Cost of cables are high as bulk wiring is required, hence suitable for less number of devices.
- Cost of maintenance is high.
- Installation and configuration is difficult

Tree Topology

Also known as Hierarchical Topology, this is the most common form of network topology in use presently.

Advantages of tree topology:

- It allows more devices to be attached to a single central hub thus it increases the distance that is travel by the signal to come to the devices.

		checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.
4.	Data transmission	In TCP the data is transmitted in a particular sequence which means that packets arrive in-order at the receiver.	On other hand there is no sequencing of data in UDP in order to implement ordering it has to be managed by the application layer.
5.	Performance	TCP is slower and less efficient in performance as compared to UDP. Also TCP is heavy-weight as compared to UDP.	On other hand UDP is faster and more efficient than TCP.
6.	Retransmissio n	As TCP provides error checking support and also guarantees delivery of data to the destination router this make it more reliable as compared to UDP.	While on other hand UDP does provided only basic error checking support using checksum so the delivery of data to the destination cannot be guaranteed in UDP as compared to that in case of TCP.

- It allows the network to get isolate and also prioritize from different computers.
- Extension of bus and star topologies.

Disadvantages of tree topology:

- If the central hub gets fails, the entire system fails.
- The cost is high because of cabling.
- If more nodes are added maintenance is difficult.

Daisy Chain

This topology connects all the hosts in a linear fashion. Each link in daisy chain topology represents single point of failure. Every link failure splits the network into two segments. Every intermediate host works as relay for its immediate hosts.

Hybrid Topology

A network structure whose design contains more than one topology is said to be hybrid topology.

Advantages of Hybrid Topology

1. Reliable as Error detecting and troubleshooting is easy.
2. Scalable as size can be increased easily.

Disadvantages of Hybrid Topology

1. Complex in design.
2. Costly.

2. Explain the following: -

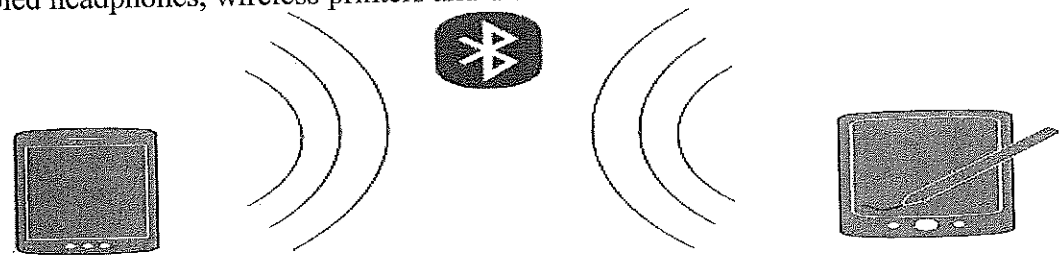
a) PAN

b) LAN

c) Internetwork

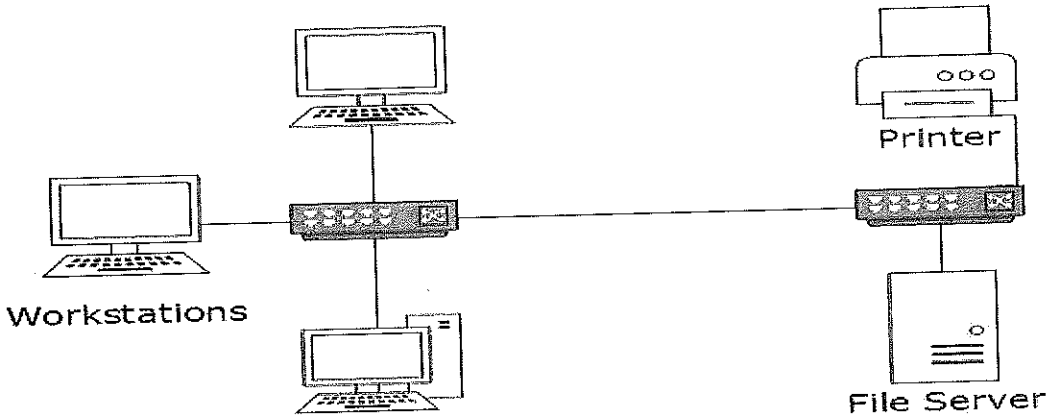
Ans. **PAN-Personal Area Network**

A Personal Area Network (PAN) is smallest network which is very personal to a user. This may include Bluetooth enabled devices or infra-red enabled devices. PAN has connectivity range up to 10 meters. PAN may include wireless computer keyboard and mouse, Bluetooth enabled headphones, wireless printers and TV remotes.



LAN-Local Area Network

A computer network spanned inside a building and operated under single administrative system is generally termed as Local Area Network (LAN). Usually, LAN covers an organization' offices, schools, colleges or universities. Number of systems connected in LAN may vary from as least as two to as much as 16 million. LAN provides a useful way of sharing the resources between end users. The resources such as printers, file servers, scanners, and internet are easily sharable among computers.



LANs are composed of inexpensive networking and routing equipment. It may contain local servers serving file storage and other locally shared applications. It mostly operates on private IP addresses and does not involve heavy routing. LAN works under its own local domain and controlled centrally.

Internetwork: A network of networks is called an internetwork, or simply the internet. It is the largest network in existence on this planet. The internet hugely connects all WANs and it can have connection to LANs and Home networks. Internet uses TCP/IP protocol suite and uses IP as its addressing protocol. Present day, Internet is widely implemented using IPv4. Because of shortage of address spaces, it is gradually migrating from IPv4 to IPv6.

Internet enables its users to share and access enormous amount of information worldwide. It uses WWW, FTP, email services, audio and video streaming etc. At huge level, internet works on Client-Server model. Internet uses very high speed backbone of fiber optics. To inter-connect various continents, fibers are laid under sea known to us as submarine communication cable. Internet is widely deployed on World Wide Web services using HTML linked pages and is accessible by client software known as Web Browsers. When a user requests a page using some web browser located on some Web Server anywhere in the world, the Web Server responds with the proper HTML page. The communication delay is very low.

3. What is the difference between TCP and UDP protocols?

Ans. Both TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) are the most widely used Internet protocols among which TCP is connection oriented – once a connection is established, data can be sent bidirectional. UDP is a simpler, connectionless Internet protocol. Multiple messages are sent as packets in chunks using UDP. Now on the basis of features of attributes we can distinguish between TCP and UDP. Following are the important differences between TCP and UDP.

S. No.	Key point	TCP	UDP
1.	Definition	It is a communications protocol, using which the data is transmitted between systems over the network. In this, the data is transmitted into the form of packets. It includes error-checking, guarantees the delivery and preserves the order of the data packets.	It is same as the TCP protocol except this doesn't guarantee the error-checking and data recovery. If you use this protocol, the data will be sent continuously, irrespective of the issues in the receiving end.
2.	Design	TCP is a connection oriented protocol.	UDP is a connection less protocol.
3.	Reliable	As TCP provides error	While on other hand UDP does

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

Machine Learning & Artificial Intelligence, First Semester

1st In-Sem. Examination

Course Code: MAI1102 **Time: 1 Hour**

Course Name: Understanding Databases **Max. Marks: 20**

Set -A

Section – A

05X01 = 05 Marks

Q.1. Which one of the following represents "one to many relationship" between Teacher and Class table?

A. One class may have many teachers B. One teacher can have many classes

C. Many classes may have many teachers D. Many teachers may have many classes

Q.2. In one-to-many relationship, which one of the following is called 'one' side in the table?

A. Child B. Owner C. Parent D. Owner

Q.3. We indicate roles in E-R diagrams by labelling the lines that connect _____ to ____.

A. Diamond, diamond B. Rectangle, diamond

C. Rectangle, rectangle D. Diamond, rectangle

Q.4. Which one of the following is the descriptive property possessed by each entity set?

A. Entity B. Attribute C. Relation D. Mode

Q.5. In a database Table, each category of information is called which one of the following?

A. Tuple B. Field C. Record D. All of these

Section – B

03X02 = 06 Marks

Q.1. What are the different levels of abstraction in the DBMS?

Q.2. What is a database model? List different types of database models.

Q.3. What is the purpose of normalization in DBMS?

Section – C

03X03 = 09 Marks

Q.1. Explain Entity, Entity Type, and Entity Set in DBMS?

Q.2. What are the different type of relationships in the DBMS?

Q.3. Explain the concept of ACID properties in DBMS?

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2020-21 (Summer Semester)

Machine Learning & Artificial Intelligence, First Semester

1st In-Sem. Examination

Course Code: MAI1102 **Time: 1 Hour**

Course Name: Understanding Databases **Max. Marks: 20**

Set –A(Answer Key)

Section – A

05X01 = 05 Marks

Q.1. Which one of the following represents "one to many relationship" between Teacher and Class table?

A. One class may have many teachers B. One teacher can have many classes

C. Many classes may have many teachers D. Many teachers may have many classes

Answer: [Option: B]

Q.2. In one-to-many relationship, which one of the following is called 'one' side in the table?

A. Child B. Owner C. Parent D. Owner

Answer: [Option: C]

Q.3. We indicate roles in E-R diagrams by labelling the lines that connect _____ to ____.

A. Diamond, diamond B. Rectangle, diamond

C. Rectangle, rectangle D. Diamond, rectangle

Answer: [Option: D]

Q.4. Which one of the following is the descriptive property possessed by each entity set?

A. Entity B. Attribute C. Relation D. Mode

Answer: [Option: B]

Q.5. In a database Table, each category of information is called which one of the following?

A. Tuple B. Field C. Record D. All of these

Answer: [Option: B]

Section – B

03X02 = 06 Marks

1. What are the different levels of abstraction in the DBMS?

Answer: There are 3 levels of data abstraction in the DBMS.

They include:

Physical Level: This is the lowest level of the data abstraction which states how the data is stored in the database.

Logical Level: This is the next level of the data abstraction which states the type of the data and the relationship among the data that is stored in the database.

View Level: This is the highest level in the data abstraction which shows/states only a part of the database

2. What is a database model? List different types of database models.

A Database model defines the logical design and structure of a database and defines how data will be stored, accessed and updated in a database management system. While the **Relational Model** is the most widely used database model, there are other models too:

Hierarchical Model

Network Model

Entity-relationship Model

Relational Model

3. What is the purpose of normalization in DBMS?

Answer: Normalization is the process of analysing the relational schemas which are based on their respective functional dependencies and the primary keys in order to fulfill certain properties.

The properties include:

To minimize the redundancy of the data.
To minimize the Insert, Delete and Update Anomalies.

Section – C

03X03 = 09 Marks

1. Explain Entity, Entity Type, and Entity Set in DBMS?

Answer:

Entity is an object, place or thing which has its independent existence in the real world and about which data can be stored in a database. **For Example,** any person, book, etc.
Entity Type is a collection of entities that have the same attributes. **For Example,** the STUDENT table contains rows in which each row is an entity holding the attributes like name, age, and id of the students, hence STUDENT is an Entity Type which holds the entities having the same attributes.
Entity Set is a collection of entities of the same type. **For Example,** A collection of the employees of a firm.

2. What are the different type of relationships in the DBMS?

Answer: Relationships in DBMS depicts an association between the tables.
Different types of relationships are:

- **One-to-One:** This basically states that there should be a one-to-one relationship between the tables i.e. there should be one record in both the tables. **Example:** Among a married couple, both wife and husband can have only one spouse.

- **One-to-Many:** This states that there can be many relationships for one i.e. a primary key table hold only one record which can have many, one or none records in the related table. **Example:** A Mother can have many children.
- **Many-to-Many:** This states that both the tables can be related to many other tables. **Example:** One can have many siblings and so do they have.

Q.3. Explain the concept of ACID properties in DBMS?

Answer: ACID properties is the combination of Atomicity, Consistency, Isolation, and Durability properties. These properties are very helpful in allowing a safe and secure way of sharing the data among multiple users.

- **Atomicity**: This is based on the concept of "either all or nothing" which basically means that if any update occurs inside the database then that update should either be available to all the others beyond user and application program or it should not be available to anyone beyond the user and application program.
- **Consistency**: This ensures that the consistency is maintained in the database before or after any transaction that takes place inside the database.
- **Isolation**: As the name itself suggests, this property states that each transaction that occurs is in isolation with others i.e. a transaction which has started but not yet completed should be in isolation with others so that the other transaction does not get impacted with this transaction.
- **Durability**: This property states that the data should always be in a durable state i.e. any data which is in the committed state should be available in the same state even if any failure or restart occurs in the system