THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc**	**Semester**	1st
Course name / Module	Basics of Networking		
Course code	ITN1104		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

Section A	05×1 = 05

Q1. Which is the shortest network covering network?

a) LAN
b) MAN
c) WAN
d) PAN

Q2.Which of the following is not a type of network topology?

a) Ring
b)Star
c) Circle
d)Bus

Q3. When two or more topologies connect together, they are called _____.

a) Tree Topology
b)Cluster Topology
c) Hybrid Topology
d) Line Topology

Q4. What does MAC stand for?

a) Communication
b) Electrical transformers
c) Musical instruments
d) Nuclear reactors

Q5. Which material is preferred for making the core of a fiber-optic cable?

a) Air
b) Diamond
c) Glass
d) Quartz

Section B	03×02 = 06

Q1. What is a Computer Networking?

Q2. What are the four types of networking?

Q3. What is optical fiber cable? Explain with cable diagram?

Section C	03×03 = 09

Q1. What is difference between UTP and STP?

Q2. What are the five main types of physical network topologies?

Q3. What are the applications of computer networks?

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**Semester**	1st/2nd/-----	
Course name / Module	Basics of Networking		
Course code	ITN1104		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
● Maximum Marks: **20**
● Duration of Examination: **01 Hour**
● Attempt all questions.

Section A	05×1 = 05

Q1. Which is the shortest network covering network?

a) LAN b) MAN

c) WAN d) PAN

Ans: (d) Personal Area Network (PAN)

Q2.Which of the following is not a type of network topology?

a) Ring b)Star

c) Circle d)Bus

Ans: (c)Circle

Q3. When two or more topologies connect together, they are called _____.

a) Tree Topology b)Cluster Topology

c) Hybrid Topology d) Line Topology

Ans: (c)Hybrid Topology

Q4. What does MAC stand for?

a) Communication transformers b) Electrical

c) Musical instruments d) Nuclear reactors

Ans: (a) Communication

Q5. Which material is preferred for making the core of a fiber-optic cable?

a) Air b) Diamond

c) Glass d) Quartz

Ans: (c) Glass

Section B	03×02 = 06

Q1. What is a Computer Networking?

Ans: Definition – A group of computers that are connected to each other and follow similar usage protocols for the purpose of sharing information and having communications provided by the networking nodes is called a Computer Network.
A network may be small where it may include just one system or maybe as large as what one may want. The nodes may further be classified into various types. These include:

- Personal Computers
- Servers
- Networking Hardware
- General Hosts

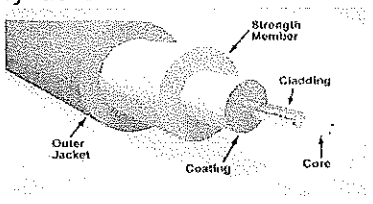
Q2. What are the four types of networking?

Ans: There are four types of Computer Networks:

1. LAN (Local Area Network) –
   - Systems connected in a small network like in a building or a small office
   - It is inexpensive
   - It uses Ethernet or Token-ring technology
2. PAN (Personal Area Network) –
   - The smallest computer network
   - Devices may be connected through Bluetooth or other infra-red enables devices
   - It has a connectivity range of up to 10 meters
3. MAN (Metropolitan Area Network) –
   - A network that can be connected within a city, for example, cable TV Connection
   - It can be in the form of Ethernet, ATM, Token-ring and FDDI
   - It has a higher range
4. WAN (Wide Area Network) –
   - A network which covers over a country or a larger range of people
   - Telephonic lines are also connected through WAN
   - Internet is the biggest WAN in the world

Q3. **What is optical fiber cable? Explain with cable diagram?**

Ans: A fiber-optic cable is composed of very thin strands of glass or plastic known as optical fibers; one cable can have as few as two strands or as many as several hundreds of them. These optical fiber cables carry information in the form of data between two places using optical or light-based technology. An optical fibre is a thin, transparent fibre, usually made of glass or plastic, for transmitting light. The construction of a single optical fibre is shown in the figure.



The basic functional structure of an optical fiber consists of an outer protective cladding and an inner core through which light pulses travel.

Section C	03×03 = 09

Q1. What is difference between UTP and STP?

Ans: UTP is the type of twisted pair cable. It stands for Unshielded twisted pair. Both Data and voice are transmitted through UTP because its frequency range is suitable. In UTP grounding cable is not necessary also in UTP much more maintenance is not needed therefore it is cost-effective.

STP is also the type of twisted pair which stands for Shielded twisted pair. In STP grounding cable is required but in UTP grounding cable is not required. in Shielded Twisted Pair (STP) much more maintenance is needed therefore it is costlier than Unshielded Twisted Pair (UTP).

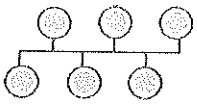
STP	UTP

can transmit data at 10Mbps, 100Mbps, 1Gbps, and 10Gbps.	can transmit data at 10Mbps, 100Mbps, 1Gbps, and 10Gbps.
the STP cable contains more materials,	the UTP cable contains less materials,
it is more expensive than the UTP cable	it is less expensive than the STP cable
Both cables use the same RJ-45 (registered jack) modular connectors.	Both cables use the same RJ-45 (registered jack) modular connectors
The STP provides more noise and EMI resistant than the UTP cable.	The UTP provides less noise and EMI resistant than the STP cable.
The maximum segment length for both cables is 100 meters or 328 feet.	The maximum segment length for both cables is 100 meters or 328 feet.
Both cables can accommodate a maximum of 1024 nodes in each segment.	Both cables can accommodate a maximum of 1024 nodes in each segment.

Q2.What are the five main types of physical network topologies?

Ans: Bus Topology

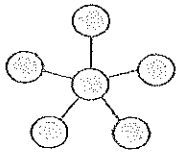
- Bus topology is a network topology in which all the nodes are connected to a single cable known as a central cable or bus.
- It acts as a shared communication medium, i.e., if any device wants to send the data to other devices, then it will send the data over the bus which in turn sends the data to all the attached devices.
- Bus topology is useful for a small number of devices. As if the bus is damaged then the whole network fails.



Bus

Star Topology

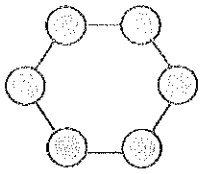
- Star topology is a network topology in which all the nodes are connected to a single device known as a central device.
- Star topology requires more cable compared to other topologies. Therefore, it is more robust as a failure in one cable will only disconnect a specific computer connected to this cable.
- If the central device is damaged, then the whole network fails.
- Star topology is very easy to install, manage and troubleshoot.
- Star topology is commonly used in office and home networks.



Star

Ring Topology

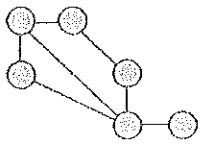
- Ring topology is a network topology in which nodes are exactly connected to two or more nodes and thus, forming a single continuous path for the transmission.
- It does not need any central server to control the connectivity among the nodes.
- If the single node is damaged, then the whole network fails.
- Ring topology is very rarely used as it is expensive, difficult to install and manage.
- Examples of Ring topology are SONET network, SDH network, etc.



Ring

Mesh Topology

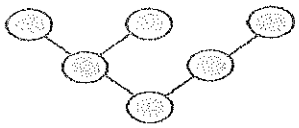
- Mesh topology is a network topology in which all the nodes are individually connected to other nodes.
- It does not need any central switch or hub to control the connectivity among the nodes.
- Mesh topology is categorized into two parts:



Mesh

Tree Topology

- Tree topology is a combination of star and bus topology. It is also known as the expanded star topology.
- In tree topology, all the star networks are connected to a single bus.
- Ethernet protocol is used in this topology.
- In this, the whole network is divided into segments known as star networks which can be easily maintained. If one segment is damaged, but there is no effect on other segments.
- Tree topology depends on the "main bus," and if it breaks, then the whole network gets damaged.



Tree

Hybrid Topology

- A hybrid topology is a combination of different topologies to form a resulting topology.
- If star topology is connected with another star topology, then it remains star topology. If star topology is connected with different topology, then it becomes a Hybrid topology.
- It provides flexibility as it can be implemented in a different network environment.
- The weakness of a topology is ignored, and only strength will be taken into consideration.

Q3. What are the applications of computer networks?

Ans: Some of the network applications in different field are the following :

- **Information and Resource Sharing** – Computer networks allow organizations having units which are placed apart from each other, to share information in a very effective manner. Programs and software in any computer can be accessed by other computers linked to the network. It also allows sharing of hardware equipment, like printers and scanners among varied users.
- **Retrieving Remote Information** – Through computer networks, users can retrieve remote information on a variety of topics. The information is stored in remote databases to which the user gains access through information systems like the World Wide Web.
- **Speedy Interpersonal Communication** – Computer networks have increased the speed and volume of communication like never before. Electronic Mail (email) is extensively used for sending texts, documents, images, and videos across the globe.

Online communications have increased by manifold times through social networking services.

- **E-Commerce** – Computer networks have paved way for a variety of business and commercial transactions online, popularly called e-commerce. Users and organizations can pool funds, buy or sell items, pay bills, manage bank accounts, pay taxes, transfer funds and handle investments electronically.
- **Highly Reliable Systems** – Computer networks allow systems to be distributed in nature, by the virtue of which data is stored in multiple sources. This makes the system highly reliable. If a failure occurs in one source, then the system will still continue to function and data will still be available from the other sources.
- **Cost-Effective Systems** – Computer networks have reduced the cost of establishment of computer systems in organizations. Previously, it was imperative for organizations to set up expensive mainframes for computation and storage. With the advent of networks, it is sufficient to set up interconnected personal computers (PCs) for the same purpose.
- **VoIP** – VoIP or Voice over Internet protocol has revolutionized telecommunication systems. Through this, telephone calls are made digitally using Internet Protocols instead of the regular analog phone lines.

THEORY 1st - IN-SEM EXAMINATION			
SESSION: 2022-23(SUMMER SEMESTER)			
B.Voc/M.Voc	**B.Voc** **Semester**	Ist	
Course name / Module	Embedded System Design Workshop		
Course code	ITN1107		
Date			
Name of the Student		**Reg. No.**	

INSTRUCTIONS
• Maximum Marks: **20**
• Duration of Examination: **01 Hour**
• Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. The colour of emitted light from LED depends on

A. Construction of LED, that is physical dimensions
B. Number of available carriers
C. Type of semiconductor material used
D. Number of recombinations taking place

2. An embedded system is a combination of _____.

A. Software
B. Hardware
C. Both a and b
D. Devices

3. Which of the following are the sources of embedded system?

A. Cell phones
B. Washing machines
C. Smart watches
D. All the above

4. Which of the following IC are microcontrollers?

A. MC6800
B. 8051
C. ATmega328
D. Both b and c

5. Which of the following are disadvantages of embedded system?

A. High technology
B. Long marketing
C. High cost
D. Both a and b

2. **Section B** (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

Q.1 Explain embedded system .

Q.2 Explain input device with example .

Q.3 Explain output device with example .

3. **Section C** (03 long type questions, each question carries 03 marks)	**03×03 = 09**

Q.1 Explain Black line follower and also explain all condition .

Q.2 Explain White Line follower and also explain all condition.

Q.3 Explain any three application of Embedded system .

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INSTRUCTIONS

- Maximum Marks: **20**
- Duration of Examination: **01 Hour**
- Attempt all questions.

1. Section A (05 objective type questions, each question carries 01 mark)	**05×1 = 05**

1. The colour of emitted light from LED depends on

Type of semiconductor material used

2. An embedded system is a combination of _____.

Both a and b

3. Which of the following are the sources of embedded system?

All the above

4. Which of the following IC are microcontrollers?

8051 and ATmega328

5. Which of the following are disadvantages of embedded system?

A. High technology

2. Section B (03 short answer type questions, each question carries 02 marks)	**03×02 = 06**

A.1 An embedded system is **a combination of computer hardware and software designed for a specific function**. Embedded systems may also function within a larger system. The systems can be programmable or have a fixed functionality.

A.2 In computing, an input device is a piece of equipment used to provide data and control signals to an information processing system, such as a computer or information appliance. Examples of input devices include keyboards, mouse, scanners, cameras, joysticks, and microphones.

A.3 An output device is any piece of computer hardware equipment which converts information into a human-perceptible form or, historically, into a physical machine-readable form for use with other non-computerized equipment. It can be text, graphics, tactile, audio, or video.

3. Section C (03 long type questions, each question carries 03 marks)	**03×03 = 09**

A.1 This simple bot is designed to be able to follow a black line on the ground without getting off the line too much. The bot has two sensors installed underneath the front part of the body, and two DC motors drive wheels moving forward. A circuit inside takes an input signal from two sensors and controls the speed of wheels' rotation. The control is done in such a way that when a sensor senses a black line, the motor slows down or even stops. Then the difference of rotation speed makes it possible to make turns. For instance, in the figure on the right, if the sensor somehow senses a black line, the wheel on that side slows down and the bot will make a right turn..

A.2 White line follower: It is **used for detecting white line on the ground surface**. It consists of highly directional photo transistor for line sensing and bright red LED for the illumination. Photo diode is directional in nature so it does not get affected by ambient light unless it is very bright..

A.3

1. Embedded System for Detecting Rash Driving on Highways

The main intention of this project is to design a highway speed-checker device that identifies rash driving on highways and alarms the traffic authorities if the speed checker finds any vehicle violating the set speed limits on highways.

2. Application of Embedded System for Street Light Control

The main intention of this project is to detect the movement of vehicles on highways and to switch on street lights ahead of it, and then to switch off the street lights as the vehicle go past the street lights to conserve energy. In this project, a PIC microcontroller is programmed by using embedded C or assembly language.

3. Embedded System for Traffic Signal Control System

The main goal of this project is to design a density based traffic signal system. At every junction, the signal timing changes automatically according to the traffic density at every junction. Traffic jam is a major problem in many cities across the world and gives regular nightmares to the commuters and travelers