



# SRI RAMAJAYAM GLOBAL SENIOR SECONDARY CBSE SCHOOL

## UNIT-2 (Chapter-11)

### COMPUTER NETWORKS (17.01.2022)

STD: XII

SUBJECT: COMPUTER SCIENCE

TIME: 90 Minutes

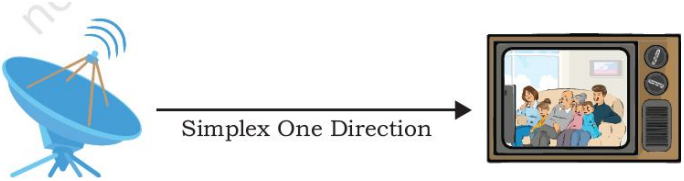


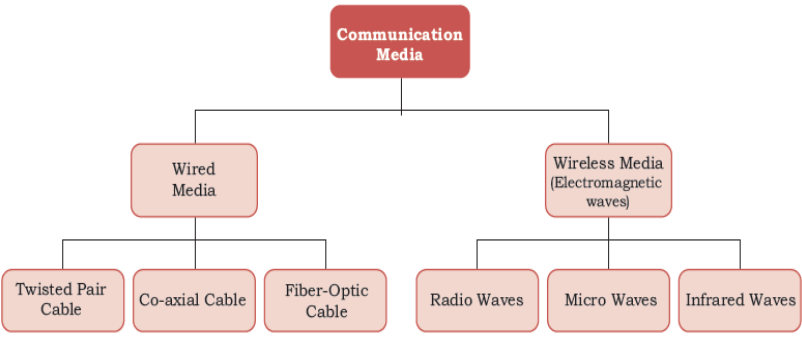
TOTAL MARKS: 35

#### General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions (11-13). Each question carries 4 marks.

SECTION-A			
Each question carries 2 marks			
Q. No	Part No.	Question	Marks
1		Out of the following, which is the fastest wired and wireless medium of transmission? <i>Infrared, coaxial cable, optical fibre, microwave, Ethernet cable</i>	2
2		Expand the following: Mbps, Wi-fi, UTP, STP	2
3		Define: Data & Communication	2
4		What are the different Types of Data Communication?	2
5	i	Switch on a ceiling fan or a light bulb, the _____ is the medium that carries electric current from switch to the fan or bulb.	1
	ii	A twisted-pair consists of two copper wires twisted like a _____ helical structure.	1
6	i	Name the protocol that is used to transfer file from one computer to another.	1
	ii	Name the protocol that is used to send emails.	1
7	i	In unguided transmission, data travels in air in terms of electromagnetic waves using an antenna. They are also known as _____ media.	1
	ii	In _____ transmission, there is a physical link made of wire/cable through which data in terms of signals are propagated between the nodes.	1

**SECTION – B**  
**Each question carries 3 marks**

8		<p><b>Expand the following terms:</b></p> <p style="text-align: center;">HTTP, FTP, PPP, SMTP, TCP/IP, POP3</p>	3
9	<p>i</p> <p>ii</p> <p>iii</p>	<p><b>Explain the following pictures.</b></p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div>	3
10		<p><b>Explain any one communication media (Wired / Wireless)</b></p> <div style="text-align: center;">  </div>	3

## SECTION-C

**Each question carries 4 marks**

11		<p>BeHappy Corporation has set up its new centre at Noida, Uttar Pradesh for its office and web-based activities. It has 4 blocks of buildings.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; margin: 0;"><b>BeHappy Corporation</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block A</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block B</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block C</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Block D</div> </div> </div> <p>Distance between the various blocks is as follows:</p> <table style="margin-left: 40px;"> <tr><td>A to B</td><td>40 m</td></tr> <tr><td>B to C</td><td>120m</td></tr> <tr><td>C to D</td><td>100m</td></tr> <tr><td>A to D</td><td>170m</td></tr> <tr><td>B to D</td><td>150m</td></tr> <tr><td>A to C</td><td>70m</td></tr> </table> <p>Numbers of computers in each block</p> <table style="margin-left: 40px;"> <tr><td>Block A -</td><td>25</td></tr> <tr><td>Block B -</td><td>50</td></tr> <tr><td>Block C -</td><td>125</td></tr> <tr><td>Block D -</td><td>10</td></tr> </table> <p>(a) Suggest and draw the cable layout to efficiently connect various blocks of buildings within the Noida 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"> <li>i. Repeater</li> <li>ii. Hub/Switch</li> </ol> <p>(c) Which kind of network (PAN/LAN/WAN) will be formed if the Noida 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 Noida?</p>	A to B	40 m	B to C	120m	C to D	100m	A to D	170m	B to D	150m	A to C	70m	Block A -	25	Block B -	50	Block C -	125	Block D -	10	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
A to B	40 m																						
B to C	120m																						
C to D	100m																						
A to D	170m																						
B to D	150m																						
A to C	70m																						
Block A -	25																						
Block B -	50																						
Block C -	125																						
Block D -	10																						
12	<p>i</p> <p>ii</p>	<p>Differentiate between packet switching and message switching technique in network communication.</p> <p>What is the difference between HTTP and FTP?</p>	<p>2</p> <p>2</p>																				
13		<p>Riana Medicos Centre has set up its new centre in Dubai. It has four buildings as shown in the diagram given below:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Accounts</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Research lab</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Packaging unit</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">Store</div> </div> </div>	<p>4</p>																				

Distance between various buildings is as follows:

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	180 m

Number of computers:

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

As a network expert, provide the best possible answer to the following queries:

- (i) Suggest the type of network established between the buildings.
- (ii) Suggest the most suitable place (i.e., building) to house the server of this organization.
- (iii) Suggest the placement of the following devices with justification: Repeater, Switch
- (iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

**\*\*\*All the Best..!\*\*\***



# SRI RAMAJAYAM GLOBAL SENIOR SECONDARY CBSE SCHOOL

## UNIT-2 (Chapter-11)

### COMPUTER NETWORKS (17.01.2022)

STD: XII  
SUBJECT: COMPUTER SCIENCE

TIME: 90 Minutes  
TOTAL MARKS: 35

#### ANSWERKEY


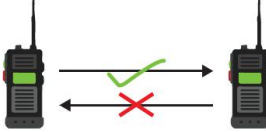

#### General Instructions

The question paper is divided into 3 sections – A, B and C

- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions (11-13). Each question carries 4 marks.

SECTION-A			
Each question carries 2 marks			
Q. No	Part No.	Question	Marks
1		Wired- optical fibre Wireless – microwave	2
2		MBps - Megabyte per second Wi-fi - Wireless Fidelity UTP - Unshielded twisted-pair STP - Shielded twisted-pair	2
3		<b>Data</b> can be any text, image, audio, video, and multimedia files. Communication is an act of sending or receiving data.  <b>Data communication</b> refers to the exchange of data between two or more networked or connected devices.	2
4		1. Simplex Communication 2. Half-duplex Communication 3. Full-duplex Communication	2
5	i	Electric wire	1
	ii	DNA	1
6	i	FTP	1
	ii	SMTP	1
7	i	wireless	1
	ii	Guided transmission	1

**SECTION – B**  
**Each question carries 3 marks**

8		<p>HTTP - Hypertext transfer Protocol          FTP - File Transfer Protocol          PPP – Point to Point Protocol          SMTP - Simple Mail Transfer Protocol          TCP/IP - Transmission control protocol / Internet protocol          POP3 - Post office protocol version-III</p>	3
9	<p style="text-align: center;">i</p> <p style="text-align: center;">ii</p> <p style="text-align: center;">iii</p>	<p><b>1. Simplex Communication</b>          It is a one way or unidirectional communication between two devices in which one device is sender and other one is receiver. Devices use the entire capacity of the link to transmit the data. It is like a one way street where vehicles can move in only one direction. For example, data entered through a keyboard or audio sent to a speaker are one way communications.</p>  <p><b>2. Half-duplex Communication</b>          It is two way or bidirectional communication between two devices in which both the devices can send and receive data or control signals in both directions, but not at the same time. While one device is sending data, the other one will receive and vice-versa. It is like sharing a one-way narrow bridge among vehicles Simplex One Direction moving in both directions.</p>  <p><b>3. Full-duplex Communication</b>          It is two way or bidirectional communication in which both devices can send and receive data simultaneously. for example, in our mobile phones and landline telephones. The capacity of the transmission link is shared between the signals going in both directions.</p> 	3
10		<p><b>Wired Transmission Media</b>          Any physical link that can carry data in the form of signals belongs to the category of wired transmission media. Three commonly used guided/wired media for data transmission are, twisted pair, coaxial cable, and fiber optic cable. Twisted-pair and coaxial cable carry the electric signals whereas the optical fiber cable carries the light signals.</p> <p><b>(A) Twisted Pair Cable</b>          A twisted-pair consists of two copper wires twisted like a DNA helical structure. Both the copper wires are insulated with plastic covers. Usually, a number of such pairs are combined together and covered with a protective outer wrapping. Each of the twisted pairs act as a single communication link. The use of twisted configuration minimises the effect of</p>	3

electrical interference from similar pairs close by. Twisted pairs are less expensive and most commonly used in telephone lines and LANs. These cables are of two types: Unshielded twisted-pair (UTP) and Shielded twisted-pair (STP)

**(B) Coaxial cable**

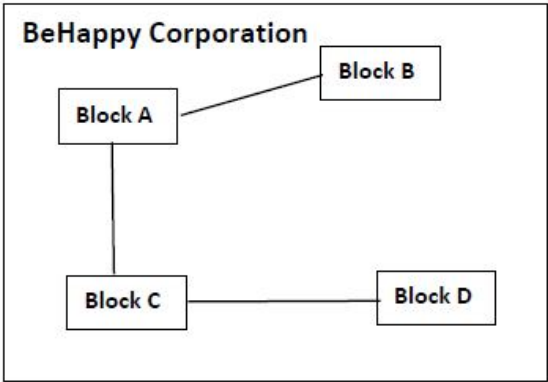
Coaxial cable is another type of data transmission medium. It is better shielded and has more bandwidth than a twisted pair. It has a copper wire at the core of the cable which is surrounded with insulating material. The insulator is further surrounded with an outer conductor (usually a copper mesh). This outer conductor is wrapped in a plastic cover.

**(C) Optical Fibre**

The optical fiber cable carries data as light, which travels inside a thin fiber of glass. Optic fiber uses refraction to direct the light through the media. A thin transparent strand of glass at the centre is covered with a layer of less dense glass called cladding. This whole arrangement is covered with an outer jacket made of PVC or Teflon. Such types of cables are usually used in backbone networks. These cables are of light weight and have higher bandwidth which means higher data transfer rate. Signals can travel longer distances and electromagnetic noise cannot affect the cable. However, optic fibers are expensive and unidirectional. Two cables are required for full duplex communication.

**SECTION-C**

**Each question carries 4 marks**

11	<p>(a)</p>  <pre> graph TD     subgraph BeHappy_Corporation         A[Block A] --- B[Block B]         A --- C[Block C]         C --- D[Block D]     end         </pre> <p>(b)</p> <p>Repeater : between C and D as the distance between them is 100 mts.</p> <p>Hub/ Switch : in each block as they help to share data packets within the devices of the network in each block</p> <p>(c) WAN.</p> <p>(d) Satellite</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>
----	--	-------------------------------------

12	i	<p><b>Message Switching</b> In message switching data is stored in buffer form. The message is, sent to the nearest directly connected switching node. This process continues until data is delivered to the destination computer.</p> <p><b>Packet Switching</b> In this form of switching data is transferring into packet form. A fixed size of packet that can be transmitted across the network is specified. All the packets are stored in the main memory instead of disk.</p>	2
	ii	<p><b>FTP</b> is a protocol used to upload files from a workstation to a FTP server or download files from a FTP server to a workstation.</p> <p><b>HTTP</b> is a protocol used to transfer files from a web server onto a browser in order to view a web page that is on the Internet.</p>	2
13		<p>(i) LAN (Local Area Network)</p> <p>(ii) Research Lab as it has the maximum number of computers.</p> <p>(iii) (a) Repeater: It should be placed between Accounts and Packaging Unit, Accounts to Research Lab, Store to Research Lab and Accounts to Packaging Unit.</p> <p>(b) Switch should be placed in each of the buildings for better traffic management.</p> <p>(iv) Firewall.</p>	4