Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Computing Skills

1st Semester / 1st In-Sem. Examinations
B. Voc. Program, Summer Semester (2019)

ITN 1101 Introduction to Computers **Time: 1 Hour**

Instruction: Answer all questions **Max. Marks: 20**

Section – A **05X01 = 05 Marks**

1. Which one of the following represents additional RAM Chips plugged into special sockets on the motherboard?
   - i) Single in-line memory modules (SIMMs)
   - ii) ii) Graphical User Modules
   - iii) iii) Single User Modules
   - iv) iv) None of the Above
2. Which one of the following refers to RAM?
   - i) Random Access Memory
   - ii) ii) Read Access Memory
   - iii) iii) Read Arithmetic Memory
   - iv) iv) Random Arithmetic Memory
3. A central processing unit consists of two main parts. It is represented by which one of the following?
   - i) Control Unit and Arithmetic Logic Unit
   - ii) ii) Control Unit and RAM
   - iii) iii) Motherboard and Arithmetic Logic Unit
   - iv) iv) Control Unit and Mother Board
4. Which of the following is the binary equivalent of the decimal number 368?

   i) 101110000 ii) 110110000 iii) 111010000 iv) 111100000
5. Which of the following represents Universal Gates?

   i) NAND & NOR ii) NAND & OR iii) AND & NOR iv) AND & OR

Section – B **03x02=06 Marks**

1. What is the required input condition (A, B, C) to make the output X=0 in Figure 1? Explain with the help of a truth table.

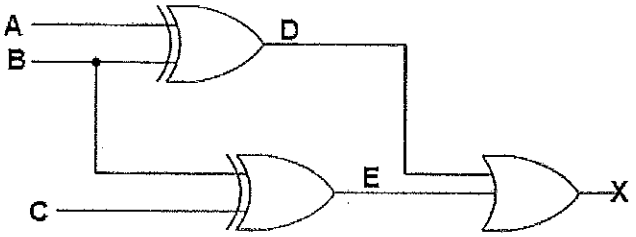


Figure 1

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

2. What is the output F of the logic diagram shown in Figure 2? Explain with the help of a truth table.

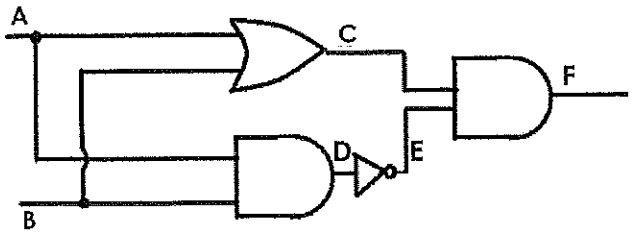


Figure 2

3. Convert the following numbers to their binary equivalent:
   i) $(2AC)_{16}$
   ii) $(745)_{8}$
   iii) $(562)_{10}$

Section – C **03X03 = 09 Marks**

1. What are the various generations of a computer? Explain in Detail.
2. Explain the functioning of Half Adder in detail.
3. What is the output (X) of the logic diagram shown in Figure 3? Explain with the help of a truth table.

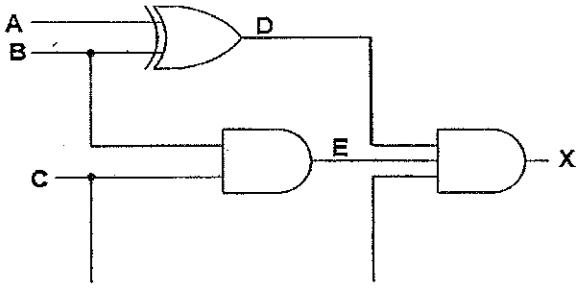


Figure 2

ITN 1101

Section A

Ans 1. i) Single in-line memory modules (SIMMs)

Ans 2. i) Random Access Memory

Ans 3. i) Control Unit and Arithmetic Logic Unit

Ans 4. i) 101110000

Ans 5. i) NAND & NOR

Section B

Ans 1. A,B,C is either 0,0,0 or 1,1,1

A	B	C	D	E	X
0	0	0	0	0	0
0	0	1	0	1	1
0	1	0	1	1	1
0	1	1	1	0	1
1	0	0	1	0	1
1	0	1	1	1	1
1	1	0	0	1	1
1	1	1	0	0	0

Ans 2.

A	B	C	D	E	F
0	0	0	0	1	0
0	1	1	0	1	1
1	0	1	0	1	1
1	1	1	1	0	0

Ans 3.

i) 1010101100
ii) 111100101
iii) 1000110010

Section C

Ans 1.

1) First Generation (1942-1955):
   - Vacuum Tubes Technology used for internal operations.
   - Supported Machine Language only.
   - Very Costly and large space required.
   - Some Computer of this generation were: ENIAC, EDVAC.
2) Second Generation (1955 -1964):
   - Transistors Technology used for internal operations.
   - Magnetic Tapes and Disk use for secondary storage device.
   - Some Computer of this generation were: IBM 1620, IBM 1401.
3) Third Generation (1964 - 1975):

- Integrated Circuits (IC)Technology used for internal operations.
- Reduction in size and cost.
- Some Computer of this generation were: IBM – 360 series, Honeywell – 6000 series.

4) Fourth Generation (1975 - 1989):
   - Large Scale Integration (LSI) and Very Large-Scale Integration (VLSI) Technology are used for internal operations.
   - All the higher-level language like C and C++, DBASE etc. are used in this generation.
   - Some Computer of this generation are: STAR 1000, CRAY -I (Super Computer).
5) Fifth Generation (1989 - Present):
   - VLSI and ULSI use for internal operations.
   - Devices based on Artificial Intelligence are still in development.

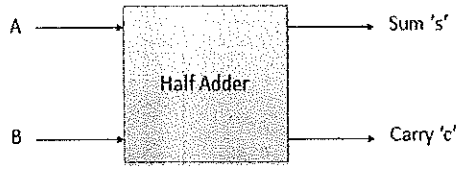
TRUTH TABLE

Inputs		Output	
A	B	S	C
0	0	0	0
0	1	1	0
1	0	1	0
1	1	0	1

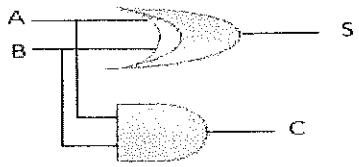
Ans 2.

Half adder is a combinational logic circuit with two input and two output. The half adder circuit is designed to add two single bit binary number A and B. It is the basic building block for addition of twosingle bit numbers. This circuit has two outputs carry and sum.

BLOCK DIAGRAM



CIRCUIT DIAGRAM



Ans 3.

A	B	C	D	E	X
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	1	0	0
0	1	1	1	1	1
1	0	0	1	0	0
1	0	1	1	0	0
1	1	0	0	0	0
1	1	1	0	1	0

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills
Session: 2019-20 (Summer)
B. Voc. Program, 1st Semester,
1st In-Sem. Examination

ITN1104
Basic Computer Networking
Instruction: Answer all Questions

Time: 1 Hour
Max. Marks: 20

Section – A

05X01 = 05 Marks

Q1. Which one of the following describes a Computer network?

A. Collection of hardware components and computers
B. Interconnected by communication channels
C. Sharing of resources and information
D. All of the above

Q2. Which one of the following is the number of layers in OSI Reference Model?

A. 4
B. 5
C. 6
D. 7

Q3. Which one of the following is the meaning of Straight-through Cable?

A. Four wire pairs connect to the same pin on each end
B. The cable Which Directly connects Computer to Computer
C. Four wire pairs not twisted with each other
D. The cable which is not twisted

Q4. Which one of the following describes the Bandwidth in a Network?

A. Transmission capacity of a communication channels
B. Connected Computers in a Network
C. Class of IP used in a Network
D. Memory in the computer

Q5. Which one of the following is called the Physical or logical arrangement of a network?

A. Topology
B. Routing
C. Networking
D. Switching

Section – B

03X02 = 06 Marks

Q6. List the advantages and drawbacks of bus topology.

Q7. Describe Network Topology. What are the main types?

Q8. What do you understand by flow control? Discuss briefly.

Section – C

03X03 = 09 Marks

Q9. What are the layers in the OSI Reference Model? Describe the function of each layer briefly.

Q10. What are the applications of Computer Networks? Discuss.

Q11. What are the different types of networks based on their size? Explain very briefly about each type.

Answer Key

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of IT(Networking

Semester- 1, 1st In-Sem Examination

B. Voc. Program, Summer (2019-20)

ITN 1104 **Time: 1 Hour**

Basic Computer Networking **Max. Marks: 20**

Instruction: Answer All Questions

Section - A

A1. D

A2. D

A3. A

A4. A

A5. A

Section – B

A6. **Advantages of bus topology**

- It works well when you have a small network.
- It's the easiest network topology for connecting computers or peripherals in a linear fashion.
- It requires less cable length than a star topology.

Disadvantages of bus topology

- It can be difficult to identify the problems if the whole network goes down.
- It can be hard to troubleshoot individual device issues.
- Bus topology is not great for large networks.
- Terminators are required for both ends of the main cable.
- Additional devices slow the network down.
- If a main cable is damaged, the network fails or splits into two.

A7. Network Topology refers to the layout of a computer network. It shows how devices and cables are physically laid out, as well as how they connect to one another. Main Type of topologies are:

1. Star 2. Bus 3. Tree 4. Mesh

A8. It is the regulation of sender's data rate so that the receiver buffer doesn't become overwhelmed i.e. flow control refers to a set of procedures used to restrict the amount of data that the sender can send before waiting for acknowledgment.

Section – C

A9. Given below are the seven layers of OSI Reference Models:

#1) Physical Layer (Layer 1): Physical Layer converts data bits into electrical impulse or radio signals. E.g. Ethernet. It uses either guided on unguided media for transmission of bits.
#2) Data Link Layer (Layer 2): At Data Link layer, data packets are encoded and decoded into bits and it provides a node to node data transfer. Data Link Layer also detects the errors occurred at Layer 1.
#3) Network Layer (Layer 3): Network Layer transfers variable length data sequence from one node to another node in the same network. This variable length data sequence is also known as "Datagrams".
#4) Transport Layer (Layer 4): It transfers data between nodes and also provides acknowledgment of successful data transmission. It keeps track of transmission and sends the segments again if the transmission fails.

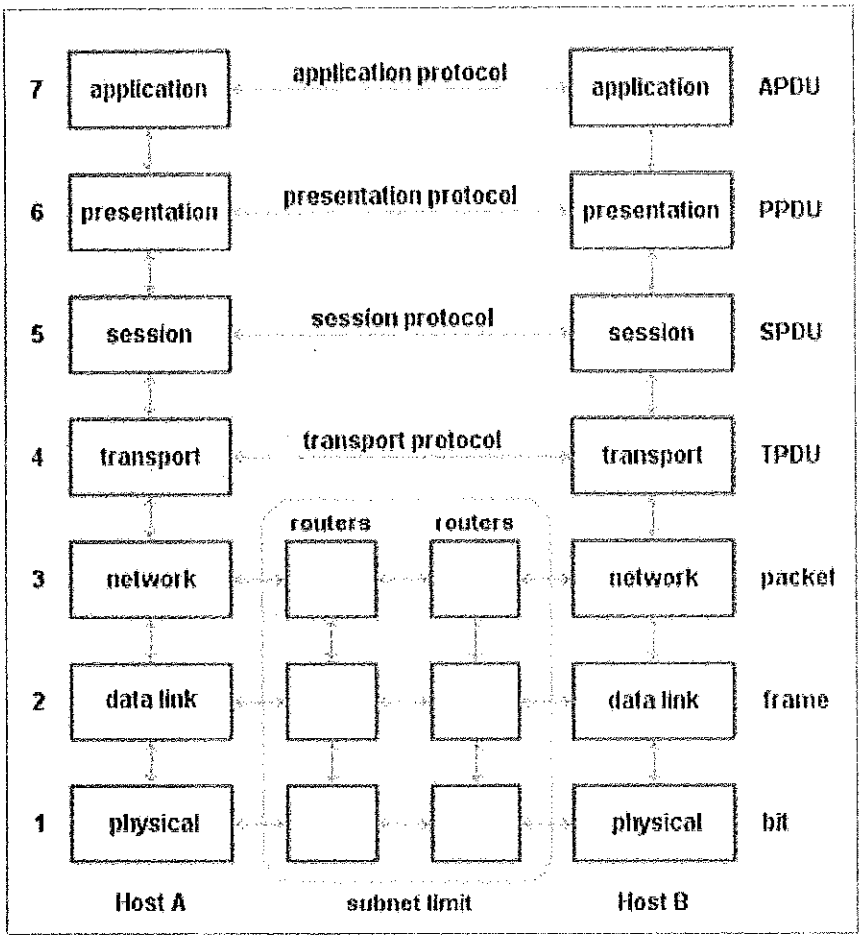


image source: OSI Reference Model

#5) Session Layer (Layer 5): Session Layer manages and controls the connections between computers. It establishes, coordinates, exchange and terminates the connections between local and the remote applications.
#6) Presentation Layer (Layer 6): It is also called as "Syntax Layer". Layer 6 transforms the data into the form in which the application layer accepts.
#7) Application Layer (Layer 7): This is the last layer of OSI Reference Model and is the one which is close to the end user. Both end-user and application layer interacts with the software application. This layer provides services for email, file transfer etc.

A10. 1. Information:

One of the applications of computer networks is the ability to provide access to remote information.

- Pay bills; carry out transactions on bank accounts etc.
- Shop from home by inspecting the catalogs of thousands of companies available online.
- Ask the newspaper for full information about your interesting topics such as corrupt politicians, big fires, football and so on.

• Access information about health, science, art, business, cooking, sports, travel, and government and so on. All this is available on the information systems like the World Wide Web (WWW).

2. Communication:

The popular application of computer networks is electronic mail or e-mail which widely used by millions of people to send and receive text messages. With real-time e-mail, remote users can Communicate even by see and hear each other at the same time. It is also possible to have virtual meetings called videoconference on-line among remote users.

3. Entertainment:

A huge and growing application is entertainment. It entertains people by allowing video demand, and has multiple real-time games etc.

A11. One way to categorize the different types of computer network designs is by their scope or scale. For historical reasons, the networking industry refers to nearly every type of design as some kind of *area network*. Common types of area networks are:

- **LAN**: Local Area Network
- **WAN**: Wide Area Network
- **WLAN**: Wireless Local Area Network
- **MAN**: Metropolitan Area Network
- **SAN**: Storage Area Network, System Area Network, Server Area Network, or sometimes Small Area Network
- **CAN**: Campus Area Network, Controller Area Network, or sometimes Cluster Area Network
- **PAN**: Personal Area Network

LAN and WAN are the two primary and best-known categories of area networks, while the others have emerged with technology advances.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2019-20

B. Voc. Program, Summer Semester

1st In-Sem. Examination

ITN1105 Operating Systems

Time: 1 Hour

Max. Marks: 20

Instruction: Attempt all questions.

Section – A

05X01 = 05 Marks

1. In multithreading which one of the following increases responsiveness to the user?

a) Continuing to run even if a part of it is blocked

b) Waiting for one part to finish before the other begins

c) Asking the user to decide the order of multithreading

d) None of the above

2. Which one of the following is the Ready state of a process?

a) When the process is scheduled to run after some another process has executed

b) When the process is unable to run until some other process is completed

c) When process is using CPU

d) None of the above

3. Which one of the following module gives control of the CPU to the process selected by the short term scheduler?

a) Dispatcher (b) Interrupt (c) Scheduler (d) Queueing

4. Which one of the following are steps in process execution

a) I/O & OS Burst
b) CPU & I/O Burst
c) Memory & I/O Burst
d) OS & Memory Burst

5. Which one of the following scheduling algorithm utilizes a time quantum?

a) Shortest job scheduling algorithm
b) Round Robin scheduling algorithm
c) Priority scheduling algorithm
d) Multilevel queue scheduling algorithm

Section – B

03X02 = 06 Marks

1. What is a process? How many states can it be in?

2. What are threads? List their types.

3. Explain the burst time and average waiting time in a process.

Section – C

03X03 = 09 Marks

1. Calculate the average waiting time for the following process and their burst time using SJF scheduling algorithm.

PROCESS	ARRIVAL TIME	BURST TIME
P1	0.0	7
P2	2.0	4
P3	4.0	1
P4	5.0	4

2. Explain different types of scheduling with appropriate diagram.
3. Make Gantt chart for Round Robin with quantum time 20 for the following processes:

PROCESS	BURST TIME
P1	53
P2	17
P3	68
P4	24

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2019-20 (Summer Semester)

B. Voc. Program, Summer Semester,

1st In-Sem. Examination

ITN1105 **Time: 1 Hour**

Operating Systems **Max. Marks: 20**

Instruction: Attempt all questions.

Section – A

05X01 = 05 Marks

1. In multithreading which one of the following increases responsiveness to the user?

a) Continuing to run even if a part of it is blocked

b) Waiting for one part to finish before the other begins

c) Asking the user to decide the order of multithreading

d) None of the above **ANSWER A**

2. Which one of the following is the ready state of a process?

a) When the process is scheduled to run after some another process has executed

b) When the process is unable to run until some other process is completed

c) When process is using CPU

d) None of the above **ANSWER A**

3. Which one of the following module gives control of the CPU to the process selected by the short term scheduler?

a) Dispatcher (b) Interrupt (c) Scheduler (d) None **ANSWER A**

4. Which one of the following are steps of process execution

a) I/O & OS Burst
b) CPU & I/O Burst
c) Memory & I/O Burst
d) OS & Memory Burst

ANSWER B

5. Which one of the following scheduling algorithm utilizes time quantum?

a) Shortest job scheduling algorithm
b) Round Robin scheduling algorithm
c) Priority scheduling algorithm
d) Multilevel queue scheduling algorithm **ANSWER B**

Section – B

03X02 = 06 Marks

1. What is a process? How many states it can be in?

Ans. A process is basically a program in execution. The execution of a process must progress in a sequential fashion. The process can be in five states: new state, running state, waiting state, ready state, terminated state.

2. What are threads? List its types.

Ans. Threads and its types. Thread is a single sequence stream within a process. Threads have same properties as of the process so they are called as light weight processes. Threads are executed one after another but gives the illusion as if they are executing in parallel. Each thread has different states.

Threads are of two types: User and kernel. User threads are supported above the kernel, without kernel support. These are the threads that application programmers would put into their programs. Kernel threads are supported within the kernel of the OS itself.

3.Explain the burst time and average waiting time in a process?

Ans. **Burst time** is the amount of time required by a process for executing on CPU. It is also called as execution time or running time. Burst time of a process cannot be known in advance before executing the process. It can be known only after the process has executed. **Waiting time** is defined as the amount of time a process has been waiting in the ready queue.

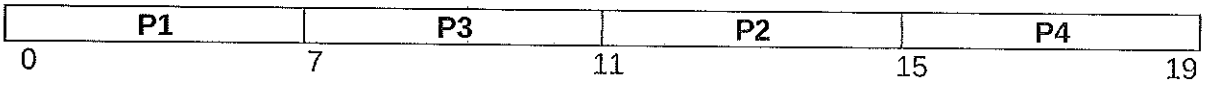
Section – C

03X03 = 09 Marks

1. Calculate the average waiting time for the following process and their burst time using SJF scheduling algorithm.

PROCESS	ARRIVAL TIME	BURST TIME
P1	0.0	7
P2	2.0	4
P3	4.0	1
P4	5.0	4

AWT= (0+3+7+10)/4=20/4 =5



2. Explain different types of scheduling with appropriate diagram.

Ans. The different types of scheduling are: Long term, short term and medium term scheduling

Long term scheduling is performed when a new process is created. It is shown in the figure below. If the number of ready processes in the ready queue becomes very high, then there is a overhead on the operating system (i.e., processor) for maintaining long lists, context switching and dispatching increases. Therefore, allow only limited number of processes in to the ready queue. The "long-term scheduler"

managers this. Long-term scheduler determines which programs are admitted into the system for processing.

Medium-term scheduling: When part of the main memory gets freed, the operating system looks at the list of suspend ready processes, decides which one is to be swapped in (depending on priority, memory and other resources required, etc). This scheduler works in close conjunction with the long-term scheduler. It is a part of the swapping function.

Short-term scheduler is also called as dispatcher. Short-term scheduler is invoked whenever an event occurs, that may lead to the interruption of the current running process. For example clock interrupts, I/O interrupts, operating system calls, signals, etc. Short-term scheduler executes most frequently. It selects from among the processes that are ready to execute and allocates the CPU to one of them. It must select a new process for the CPU frequently. It must be very fast.

3. Make Gantt chart for Round robin with quantum time 20 for following process:

PROCESS	BURST TIME
P1	53
P2	17
P3	68
P4	24

P1	P2	P3	P4	P1	P3	P4	P1	P3	P3

0 20 37 57 77 97 117 121 134 154 162

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Computing Skills

Session: 2019-20 (Summer)

B. Voc. 1st Semester, 1st In-Sem. Examination

ITN1302 Wireless Networks **Time: 1 Hour**

Max. Marks: 20

Answer all questions

Section – A

05X01 = 05 Marks

1. Which one of the following is the full form of WPA?
   (A) Wireless Protocol Access
   (B) Wi-Fi Protected Access
   (C) Wireless Protected Application
   (D) Wi-fi Protocol Application
2. Which one of the following is abbreviated for DNS?
   A) Dynamic name system
   B) Domain name system
   C) Dynamic Network system
   D) Domain name server
3. Which one of the following is the unit for transmission speed of a network?
   (A) Bit/s
   (B) Byte/s
   (C) Bit/m
   (D) Byte/m
4. Which one of the following does IEEE 802.11 represent?
   (A) WAN
   (B) LAN
   (C) Bluetooth
   (D) none of the above
5. Which one of the following technology is used for multiplexing in WiFi?
   (A) OFDM
   (B) FDM
   (C) TDM
   (D) OTDM

Section – B

02X03=6 Marks

1. Why do you use wi-fi rather than wired network? Explain.
2. What is a MODEM? Why is it used?
3. Change the following IP address from binary notation to dotted-decimal notation 10000001 00001011 00001011 11101111. Where are addresses 127.0.0.0 to 127.255.255.255 used?

Section – C

03X03 = 09 Marks

1. What are the differences between 802.11a and 802.11b networks? Discuss 802.11g wi-fi network.
2. Why is network security protocol required? Discuss.
3. There are two signals with frequencies f_1=3 kHz and f_2=3GHz. Calculate the required antenna length for transmissions of these signals. (Velocity of EM wave (c)= $3X10^8$m/s).

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of Computing Skills

Session: 2019-20 (Summer)

B. Voc. 1st Semester, 1st In-Sem. Examination

ITN1302 Wireless Networks **Time: 1 Hour**

Max. Marks: 20

Answer all the questions

Section – A

05X01 = 05 Marks

1. Which one of the following is the full form of WPA?
   (A) Wireless Protocol Access
   (B) Wi-Fi Protected Access
   (C) Wireless Protected Application
   (D) Wi-fi Protocol Application
2. Which of the following is abbreviated for DNS?
   A) Dynamic Name System
   B) Domain Name System
   C) Dynamic Network system
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   (A) Bit/s
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   (C) Bit/m
   (D) Byte/m
4. Which one of the following does IEEE 802.11 represent?
   (A) WAN
   (B) LAN
   (C) Bluetooth
   (D) none of the above
5. Which one of the following technology is used for multiplexing in WiFi?
   (A) OFDM
   (B) FDM
   (C) TDM
   (D) OTDM

Section – B **02X03=6 Marks**

1. Why do you use wi-fi rather than wired network? Explain.
   Ans: Due to the following advantages, wi-fi network is widely used.
   a. Cloud-based Wi-Fi easy setup
   b. Wi-Fi is fast enough
   c. Wi-fi uses encryption to protect data
   d. Versatile and flexible to use

2. What is MODEM? Why is it used?
   Ans: Ans: A modem is a device that converts data into a format suitable for a transmission medium so that it can be transmitted from computer to computer or other network devices.
   During the transmission of signal, encoding of message signal/data is required. So, modulation is required. Again, at the receiver end, to receive the required signal

demodulation is essential. Thus, to MODEM is used for encoding and decoding of signal.

3. Change the following IP address from binary notation to dotted-decimal notation 10000001 00001011 00001011 11101111. Where are addresses 127.0.0.0 to 127.255.255.255 used? Ans: 129.11.11.239

127.0.0.0 to 127.255.255.255 used for loop back and diagnostics purposes

Section – C

03X03 = 09 Marks

1. What are the differences between 802.11a and 802.11b networks? Discuss 802.11g wi-fi network.

   Ans: 802.11a operates in the 5-GHz frequency band. 802.11a's bandwidth and frequency is 5GHz and speed is of 54 Mbps. It use OFDM for the modulation.

   802.11b operates in 2.4GHz band. Its speed is 11 Mbps. It covers up to 300 feet distance. Its capacity is 32 users per Access Point. Its range is quite large and used where range matters rather then the density. It normally installed in both business and homes for easiest migration between the two locations.

   802.11g is a high-speed extension to 802.11b. These are following propeties

   - Compatible with 802.11b
   - High speed up to 54 Mbps
   - 2.4 GHz (vs. 802.11a, 5 GHz)
   - Uses ODFM technology
   - Adaptive Rate Shifting

2. Why is network security protocol required? Discuss.

   Ans: Network security protocols are used to protect computer data and communication in transit. The primary tool used to protect information as it travels across a network is cryptography. Cryptography uses algorithms to encrypt data so that it is not readable by unauthorized users. Generally, cryptography works with a set of procedures or protocols that manage the exchange of data between devices and networks. Together, these cryptographic protocols enhance secure data transfer.

3. There are two signals with frequencies f_1=3 kHz and f_2=3GHz. Calculate the required antenna length for transmissions of these signals. (Velocity of EM wave (c)= $3X10^8$m/s).

   Ans: Signal with frequency f1=3 kHz, $\lambda=3X10^8/3X10^2 = 10^6$ m, Length of Antenna=$10^6/4=2.5X10^5$ m

   For Signal frequency f2=3 GHz, $\lambda=3X10^8/3X10^9$= 0.1m, Antenna length=0.1/4=0.025 m.