Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Question Paper

School of IT (Networking & ML-AI)

First Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

ITN1101 Introduction to Computers **Time: 1 Hour**

Max. Marks: 20

Instruction: Attempt All Questions.

Section – A

05 x 01 = 05 Marks

1. If a 3-input AND gate has eight input possibilities, which one of the following possibilities will result in a HIGH output?
   A) 3 B) 1 C) 4 D) 7
2. Which one of the following logical operations is represented by the + sign in Boolean algebra?
   A) AND B) NOT C) OR D) NOR
3. Which one of the following is the 2's complement of 11010010?
   A) 00101101 B) 11011101 C) 00101110 D) 00101111
4. Which one of the following is the father of modern computers?
   A) Garden Moore B) Blaise Pascal C) Charles Babbage D) None of these
5. According to boolean algebra absorption law, which one of the following is correct?
   A) x+xy=x B) (x+y)=xy C) xy+y=x D) x+y=y

Section – B

03 x 02 = 06 Marks

1. Convert the following:
   A) $(1111.1011)_2 = (\ldots\ldots\ldots\ldots)_{10}$
   B) $(4287)_{10} = (\ldots\ldots\ldots)_8$
2. Explain the working of AND and OR gates with their Truth Table.
3. Discuss the functional blocks of a computer system.

Section – C

03 x 03 = 09 Marks

1. Discuss the fourth and fifth generations of computers. Write about their technical advancements.
2. Complete the following operations (Use conversion, if necessary):
   A) $(54277)_8 + (44162)_8$ B) $(4214)_8 + (2315)_{10}$
3. What are Universal gates? Implement all 3 basic logic gates using NAND gate.

Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Answer Sheet

School of (IT Networking & MLAI)

First Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

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

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

Instruction: Attempt All Questions.

Section – A

05 x 01 = 05 Marks

1. If a 3-input AND gate has eight input possibilities, which one of the following possibilities will result in a HIGH output?
   A) 3 B) 1 C) 4 D) 7
   Answer: B
2. Which of the following logical operations is represented by the + sign in Boolean algebra?
   A) AND B) Complementation C) OR D) Inversion
   Answer: C
3. Which one of the following is 2's complement of 11010010?
   A) 00101101 B) 11011101 C) 00101110 D) 00101111
   Answer: C
4. Which one of the following is the father of modern computer?
   A) Garden Moore B) Blaise Pascal C) Charles Babbage D) None of these
   Answer: C
5. According to boolean algebra absorption law, which one of the following is correct?
   A) x+xy=x B) (x+y)=xy C) xy+y=x D) x+y=y
   Answer: A

Section – B

03 x 02 = 06 Marks

1. Convert the following:
   A) $(1111.1011)_2 = (\mathbf{15.6875})_{10}$

   B) $(4287)_{10} = (\mathbf{10277})_8$

2. Explain the working of AND and OR gates with Truth Table.
   Answer:

I) AND Gate:

Symbol -

Expression: Out = A.B

Out = 1, if and only if A and B, both are equal to 1. Otherwise, the result is zero.

Truth Table:

A	B	Out
0	0	0
0	1	0
1	0	0
1	1	1

II) OR Gate:

Symbol -

OR gate

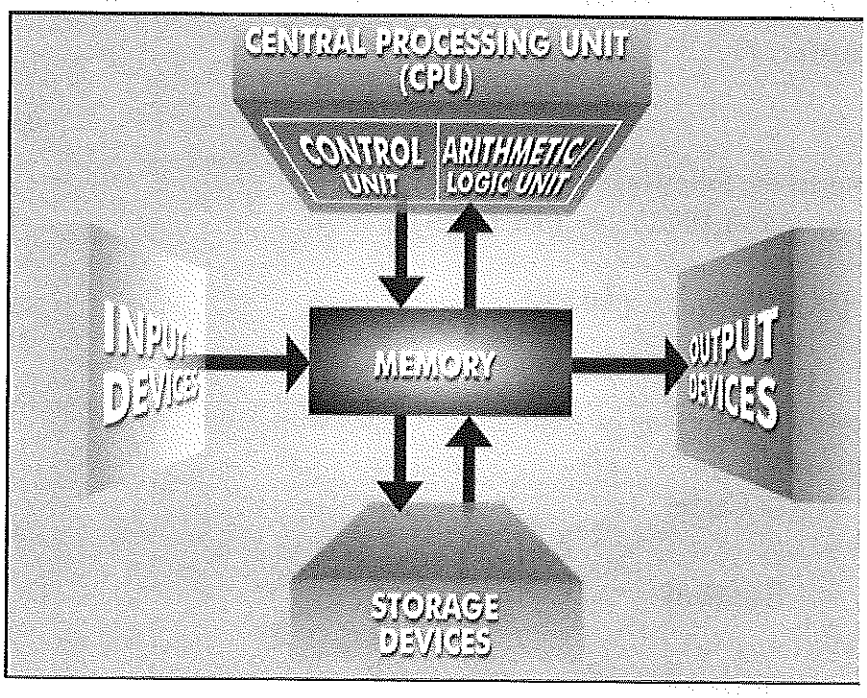
Expression: Out = A + B

Out = 1 if A = 1 or B =1; Otherwise, the result is zero.

Truth Table:

A	B	Out
0	0	0
0	1	1
1	0	1
1	1	1

3. Discuss the functional blocks of computer system.
Answer:
Discussion of these blocks.



BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Section – C

03 x 03 = 09 Marks

1. Discuss about the fourth and fifth generations of computer. Write about their technical advancements.

Answer:

1) Fourth Generation (1978 - Present):
   - 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).
2) Fifth Generation (Present - Future):
   - VLSI and ULSI use for internal operations.
   - Devices based on Artificial Intelligence are still

2. Complete the following operations (Please do the conversion, if necessary):

A) $(54277)_8 + (44162)_8$

Answer: $(120461)_8$

B) $(4214)_8 + (2315)_{10}$

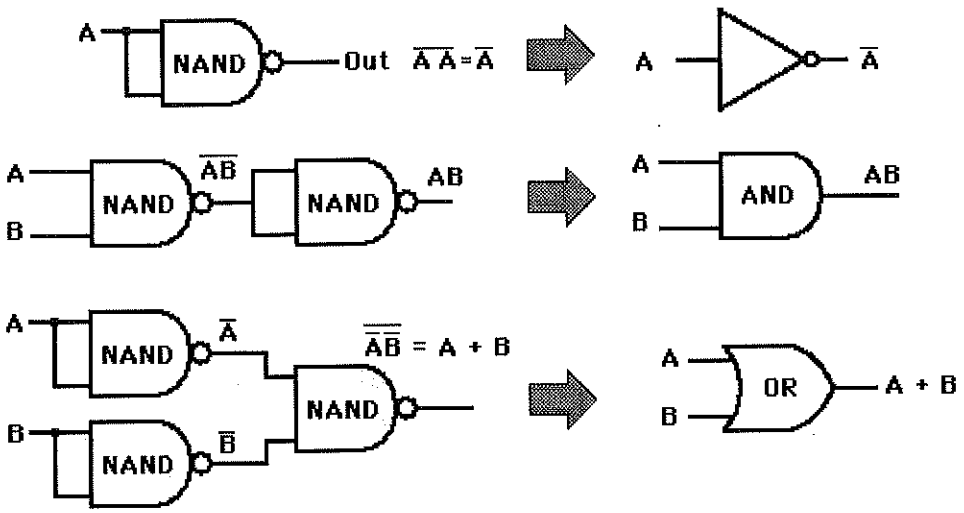
Answer: $(10627)_8$

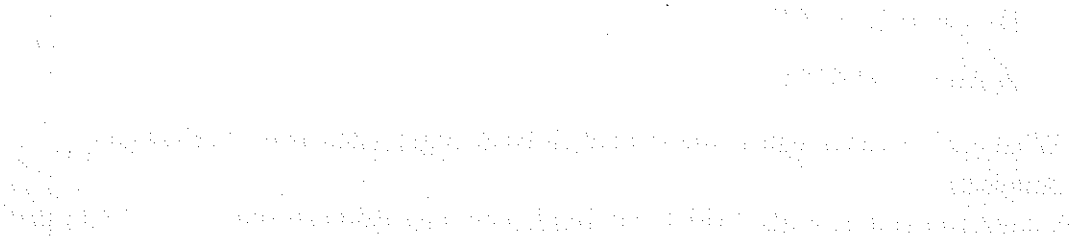
3. What are Universal gates? Implement all basic logic gates using NAND gate.

Answer:

A universal gate is a gate which can implement any Boolean function without need to use any other gate type. The NAND and NOR gates are universal gates.

Implementation Using NAND Gate:





Registration No.....

SCHOOL OF IT (Networking)

FIRST IN-SEMESTER EXAMINATION – 2018

SUMMER SEMESTER, B. VOC. PROGRAM

ITN1102 Computer Assembly & Peripheral Installation Time: 1 Hour

Max. Marks: 20

Instructions: Attempt all questions.

Section-A Objective Type Questions (5x1) Marks

1. Which one of the following is the sequence in the CPU for each instruction of program in memory
   a. decode - fetch - execute sequence
   b. execute - store - decode sequence
   c. fetch - decode - execute sequence
   d. fetch - execute - decode sequence

2. Which one of the following does a Central Processing Unit (CPU) consist of
   a. control unit
   b. arithmetic and logic unit
   c. main store
   d. all of above
3. Which one of the following does SMPS stand for
   a. Switch Mode Power Supply
   b. Simple Mode Power Supply
   c. Switch Means Power Supply
   d. None of the above
4. Which one of the following is NOT a type of motherboard expansion slot?
   a. ISA b. PCI c. AGP d. ATX
5. Which one of the following function can a computer ALU perform?
   a. addition
   b. subtraction
   c. multiplication
   d. All of the above

Section-B Short-Answer Type Questions (3x2) Marks

1. Name 3 input and 3 output devices.
2. What is a register in a computer? What are its functions?
3. What gives your computer power? Discuss.

Section-C Essay Type Questions (3x3) Marks

1. Give is the difference between ROM and RAM?
2. What is an SMPS? Discuss.
3. Describe the different ports in a motherboard and explain what they are used for.

ITN1002 Question Paper with Answers

Registration No.....

SCHOOL OF IT (Networking)

FIRST IN-SEMESTER EXAMINATION – 2018

SUMMER SEMESTER, B. VOC. PROGRAM

ITN1002 Computer Assembling & Peripheral Installation **Time: 1 Hour**

Max. Marks: 20

Instructions: **Attempt all questions.**

Section-A Objective Type Questions **(5x1) Marks**

1. For each instructions of program in memory the CPU goes through a

   a. decode - fetch - execute sequence
   b. execute - store - decode sequence
   c. fetch - decode - execute sequence
   d. fetch - execute - decode sequence

   Ans : c

2. Which of the following a Central Processing Unit (CPU) consists of
   a. control unit
   b. arithmetic and logic unit
   c. main store
   d. all of above

   Ans ; d

3. Which of the following SMPS stands for
   a. Switch Mode Power Supply
   b. Simple Mode Power Supply
   c. None of the above

   Ans ; b

4. Which of the following is NOT a type of motherboard expansion slot?
   a. ISA
   b. PCI
   c. AGP
   d. ATX

   Ans : b

5. Which of the following a computer, ALU can perform?
   a. addition
   b. subtraction
   c. multiplication
   d. All of the above

   Ans : d

Section-B Short-Answer Type Questions **(3x2) Marks**

1. Name 3 input devices and 3 output devices
   Ans : **Input device:** Keyboard, mouse, joysticks
   Output Device: Monitor, Printer, Speaker
2. What is register in computer?
   Ans : It is an electronic component that is used to hold the information as bits. Register can be 2-bits register,4-bit register, 8-bit register. Register uses the cell to hold the bit that is called flip-flops. (collection of flip-flop I called register)
3. What gives your computer power?
   Ans : SMPS

Section-C Essay Type Questions **(3x3) Marks**

1. **What is the difference between ROM and RAM?**
   Ans :

BASIS FOR COMPARISON	RAM	ROM
Basic	It is a read-write memory.	It is read only memory.
Use	Used to store the data that has to be currently processed by CPU temporarily.	It stores the instructions required during bootstrap of the computer.
Volatility	It is a volatile memory.	It is a nonvolatile memory.
Stands for	Random Access Memory.	Read Only Memory.
Modification	Data in ROM can be modified.	Data in ROM can not be modified.
Capacity	RAM sizes from 64 MB to 4GB.	ROM is comparatively smaller than RAM.

2. **What is SMPS?**
   Ans : A switched-mode power supply (SMPS) is an electronic circuit that converts power using switching devices that are turned on and off at high frequencies, and storage components such as inductors or capacitors to supply power when the switching device is in its non-conduction state.

3. **Describe each of the different ports of motherboard and explain what they are used for?**

   Ans : Serial Port

   - Used for external modems and older computer mouse
   - Two versions: 9 pin, 25 pin model
   - Data travels at 115 kilobits per second

   Parallel Port

   - Used for scanners and printers
   - Also called printer port
   - 25 pin model
   - IEEE 1284-compliant Centronics port

PS/2 Port

- Used for old computer keyboard and mouse
- Also called mouse port
- Most of the old computers provide two PS/2 port, each for the mouse and keyboard
- IEEE 1284-compliant Centronics port

Universal Serial Bus (or USB) Port

- It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc.
- It was introduced in 1997.
- Most of the computers provide two USB ports as minimum.
- Data travels at 12 megabits per seconds.
- USB compliant devices can get power from a USB port.

VGA Port

- Connects monitor to a computer's video card.
- It has 15 holes.
- Similar to the serial port connector. However, serial port connector has pins, VGA port has holes.

Power Connector

- Three-pronged plug.
- Connects to the computer's power cable that plugs into a power bar or wall socket.

Firewire Port

- Transfers large amount of data at very fast speed.
- Connects camcorders and video equipment to the computer.
- Data travels at 400 to 800 megabits per seconds.
- Invented by Apple.
- It has three variants: 4-Pin FireWire 400 connector, 6-Pin FireWire 400 connector, and 9-Pin FireWire 800 connector.

Modem Port

- Connects a PC's modem to the telephone network.

Ethernet Port

- Connects to a network and high speed Internet.
- Connects the network cable to a computer.
- This port resides on an Ethernet Card.
- Data travels at 10 megabits to 1000 megabits per seconds depending upon the network bandwidth.

School of IT (Networking)

Semester- 1, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

ITN 1104 Basic Computer Networking

Time: 1 Hour

Max. Marks: 20

Instruction: Write neatly and draw diagrams where necessary.

Section – A

05X01 = 05 Marks

Q1. Which one of the following is the size of MAC Address? A. 16-bits B. 32-bits C. 48-bits D. 64-bits	Q2. MAC Address is an example of which of the following layer? A. Transport Layer B. Data Link Layer C. Application Layer D. Physical Layer
Q3. Which 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. If an Optical Carrier is represented as OC-n, generally the link speed is given (in Mbps) by which of the following? a) n*39.8 b) n*51 c) 2n*51.8 d) None of the above
Q5. Which of the following is called the Physical or logical arrangement of network? a) Topology b) Routing c) Networking d) None of the above	

Section – B

03X02 = 06 Marks

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

Q6. What is multiplexing? Explain.

Q7. List the functions of data link layer.

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

Section – C

03X03 = 09 Marks

03 essay type questions, each question carries 03 marks.

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

Q10. What are TCP and UDP? Explain each one and also write down the comparison of the two protocols.

Q11. What are the different types of media used for transmission of data. Briefly explain each one of them.

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of IT(Networking

Semester- 1, 1st In-Sem Examination

B. Voc. Program, Summer (2018-19)

Course Code: ITN 1104 **Time: 1 Hour**

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

Instruction: Write neatly and draw diagram where necessary.

Section - A

A1. C

A2. B

A3. A

A4. B

A5. A

Section – B

A6. Multiplexing is the process of dividing a link, the physical medium, into logical channels for better efficiency. Here medium is not changed but it has several channels instead of one. It can also be defined as combining various smaller channels in to one large capacity channel for better utilization of band width.

A7. Data link layer is responsible for carrying packets from one hop (computer or router) to the next. The duties of data link layer include packetizing, addressing, error control, flow control, medium access control.

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.

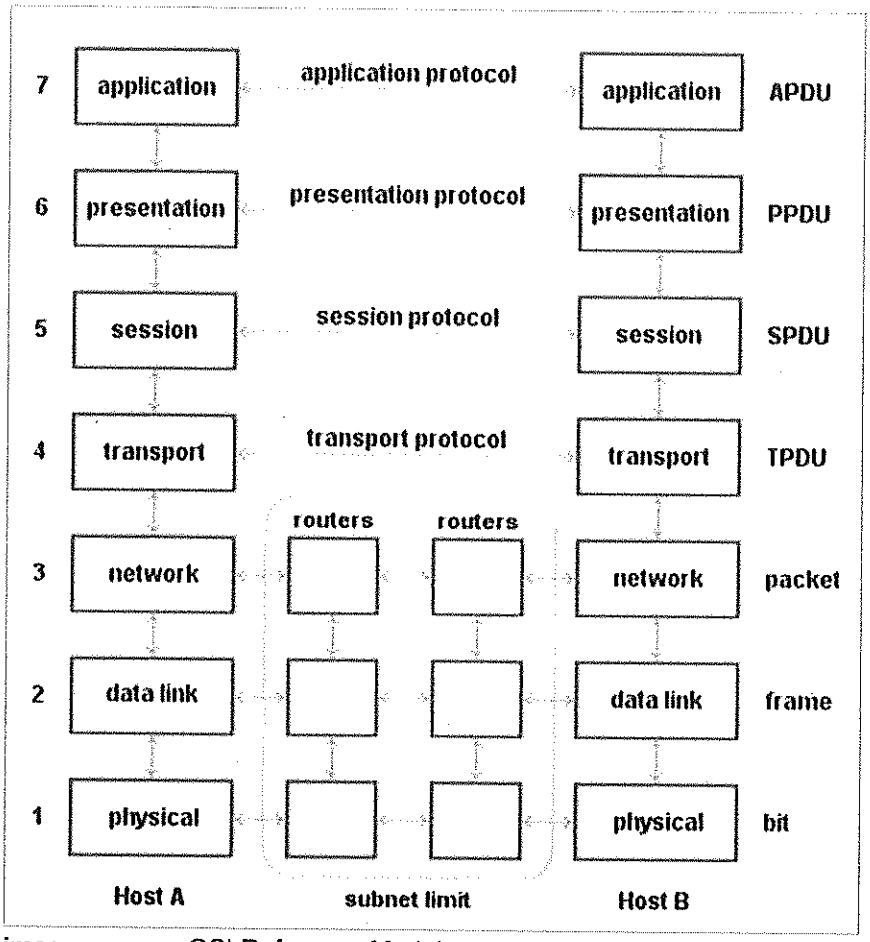


image source: OSI Reference Model

#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. Common factors in TCP and UDP:

- TCP and UDP are the most widely used protocols that are built on the top of IP protocol.
- Both protocols TCP and UDP are used to send bits of data over the internet, which is also known as 'packets'.
- When packets are transferred using either TCP or UDP, it is sent to an IP address. These packets are traversed through routers to the destination.

TCP	UDP
TCP stands for Transmission Control Protocol	UDP is stands for User Datagram Protocol or Universal Datagram Protocol
Once the connection is setup, data can be sent bi-directional i.e. TCP is a connection oriented protocol	UDP is connectionless, simple protocol. Using UDP, messages are sent as packets
The speed of TCP is slower than UDP	UDP is faster compared to TCP
TCP is used for the application where time is not critical part of data transmission	UDP is suitable for the applications which require fast transmission of data and time is crucial in this case.
TCP transmission occurs in a sequential manner	UDP transmission also occurs in a sequential manner but it does not maintain the same sequence when it reaches the destination
It is heavy weight connection	It is lightweight transport layer

TCP	UDP
TCP tracks the data sent to ensure no data loss during data transmission	UDP does not ensure whether receiver receives packets are not. If packets are misses then they are just lost

A11. There are two types of transmission media :

- Guided (Wire line)
- Unguided(Wireless)

Guided Media :

- Unshielded Twisted Pair (UTP)
- Shielded Twisted Pair
- Coaxial Cable
- Optical Fiber

Unshielded Twisted Pair (UTP) : UTP is the copper media, inherited from telephony, which is being used for increasingly higher data rates, and is rapidly becoming the de facto standard for horizontal wiring, the connection between, and including, the outlet and the termination in the communication closet.

A Twisted Pair is a pair of copper wires, with diameters of 0.4-0.8 mm, twisted together and wrapped with a plastic coating. The twisting increases the electrical noise immunity, and reduces the bit error rate (BER) of the data transmission.

Shielded Twisted Pair (STP) : STP is heavier and more difficult to manufacture, but it can give better data rates.

Coaxial Cable: Coaxial cable is a two-conductor cable in which one conductor forms an electromagnetic shield around the other. The two conductors are separated by insulation. It is a constant impedance transmission cable. This media is used in base band and broadband transmission.

Optical Fiber : Optical fiber consists of thin glass fibers that can carry information at frequencies in the visible light spectrum and beyond. The typical optical fiber consists of a very narrow strand of glass called the core. Around the core is a concentric layer of glass called the cladding. All long haul transmission links are being replaced by Fibers because of its large capacities.

Unguided Media: In Unguided transmission media the data signals flow through the air. They are not guided or bound to a channel to follow. Following are unguided media used for data communication.

- Radio Transmission
- Microwave
- Satellite Communication

- RF Propagation: There are three types of RF (radio frequency) propagation :

- Ground Wave
- Ionospheric
- Line of Sight (LOS)

Up to 3 Mhz are ground waves which follows the curvature of the Earth. AM radio is an example of ground wave propagation.

Ionospheric propagation bounces off of the Earth's ionospheric layer in the upper atmosphere in the frequency range of 3-30 MHz.

Frequencies above 30 MHz provides Line of sight propagation. The receive station must be in the view of the transmit station. It is limited by the curvature of the Earth for ground-based stations (40 - 100 km, from horizon to horizon). Examples of line of sight propagation are: FM radio, microwave and satellite.

Satellite : Satellites are transponders (units that receive on one frequency and retransmit on another) that are set in geostationary orbits directly over the equator. These geostationary orbits are 36,000 km from the Earth's surface.

Registration No: .....

SCHOOL OF IT (Networking)

FIRST IN-SEMESTER EXAMINATION – 2018

SUMMER SEMESTER, B. VOC. 1st semester

ITN1105 Basics of Operating Systems Time: 1 Hour

Max. Marks: 20

Instructions: Attempt all questions.

Section-A Objective Type Questions (5x1) Marks

1. State whether the following statements are TRUE or FALSE:
ii. Operating System acts as Resource Manager.
iii. Operating System is not responsible for booting the computer.
iv. In multiprogramming, the prime focus is to maximize the response time.
v. In multiprocessor systems, all processors operate under different operating systems.
vi. The characters ? and * are known as wild card characters.

Section-B Short-Answer Type Questions (3x2) Marks

1. What are internal and external DOS commands? Give at least two examples of each.
2. List any four examples (names) of Operating Systems?
3. What are Time Sharing Systems? Discuss.

Section-C Essay Type Questions (3x3) Marks

1. Explain briefly Simple Batch Systems.
2. What are Clustered Systems and why are they used?
3. Explain Shortest Job First Scheduling and draw Gantt Chart showing average waiting time for each process.

Registration No: .....

SCHOOL OF IT (Networking)

FIRST IN-SEMESTER EXAMINATION – 2018

FIRST SEMESTER, B. VOC. PROGRAM

ITN1005 Basics of Operating System **Time: 1 Hour**

Max. Marks: 20

Instructions: **Attempt all questions.**

Section-A Objective Type Questions **(5x1) Marks**

State whether following statements are **TRUE** or **FALSE**:

i. Operating System acts as Resource Manager. **TRUE**
ii. Operating System is not responsible for booting the computer. **FALSE**
iii. In multiprogramming the prime focus is to maximize the response time. **FALSE**
iv. In multiprocessor system all processors operate under different operating systems. **FALSE**
v. The characters ? and * are known as wild card characters. **TRUE**

Section-B Short-Answer Type Questions **(3x2) Marks**

Q.1. What are internal and external DOS commands? Give at least two example of each.

Answer:

Internal Commands are those commands which are contained in the shell (cmd.exe), i.e., these commands are inbuilt in the shell, whereas, the external commands are those commands whose file exists on the drive with .exe or .com extension.

Example:

Internal Commands: CD, RD, MD, COPY, DIR etc.

External Commands: CHKDSK, XCOPY, Notepad etc.

Q2. List any four examples (names) of Operating System?

Answer:

Following are the examples of some popular operating systems:

i. Linux
ii. Unix
iii. Windows 10
iv. Solaris
v. MacOS

vi. Andriod
vii. IOS etc.

Q3. What are Time Sharing Systems?

Answer:

Time-Sharing Systems are an extension of multiprogramming systems. Time-sharing is the sharing of a computing resource among many processes or users by means of multiprogramming and multi-tasking at the same time. In time sharing systems the prime focus is on minimizing the response time of CPU.

Section-C Essay Type Questions **(3x3) Marks**

Q1. Explain briefly Simple Batch Systems.

Answer:

Simple batch systems: in this type of system, there is no direct interaction between user and the computer. The user has to submit a job (written on cards or tape) to a computer operator. Then computer operator places a batch of several jobs on an input device. Jobs are batched together by type of languages and requirement. Then a special program, the monitor, manages the execution of each program in the batch. The monitor is always resident in the main memory and available for execution.

Following are some disadvantages of this type of system:

- No interaction between user and computer.
- No mechanism to prioritise the processes.

Q2. What are Clustered Systems and why they are used?

Answer:

Clustered systems: like parallel systems, clustered systems gather together multiple CPUs to accomplish computational work. Clustered systems differ from parallel systems, however, in that they are composed of two or more individual systems coupled together. The definition of the term clustered is **not concrete;** the general accepted definition is that clustered computers share storage and are closely linked via LAN networking. Clustering is usually performed to provide **high availability**. A layer of cluster software runs on the cluster nodes. Each node can monitor one or more of the others. If the monitored machine fails, the monitoring machine can take ownership of its storage, and restart the application(s) that were

running on the failed machine. The failed machine can remain down, but the users and clients of the application would only see a brief interruption of service.

Clustered technology is rapidly changing. Clustered system use and features should expand greatly as **Storage Area Networks(SANs)**. SANs allow easy attachment of multiple hosts to multiple storage units. Current clusters are usually limited to two or four hosts due to the complexity of connecting the hosts to shared storage.

Q3. Explain Shortest Job First Scheduling and draw Gantt Chart showing average waiting time for each process.

Answer:

Shortest-Job-First(SJF) Scheduling

- Best approach to minimize waiting time.
- Actual time taken by the process is already known to processor.
- Impossible to implement.

PROCESS	BURST TIME
P1	21
P2	3
P3	6
P4	2

In Shortest Job First Scheduling, the shortest Process is executed first.

Hence the GANTT chart will be following :

Now, the average waiting time will be = (0 + 2 + 5 + 11)/4 = 4.5 ms

Registration No.....

Bhartiya Skill Development University
School of IT & Networking
1st Semester / 1st In-Sem. Examinations
B. Voc. Program, Summer/Winter Semester (2018-19)

ITN1106 Network Server Management **Time: 1 Hour**

Max. Marks: 20

Instructions: Attempt all questions.

Section-A **(5x1) =05 Marks**

1. Which one of the following provides services to client computers?

a) Workgroup b) Server c) Both d) None of them

2.Which one of the following is a dedicated Server?

a) Linux b) Windows c) Novell d) None of them

3.Which one of the following is used to remove the user credentials?

a) dsadd b) dsmod c) dsrm d) dsquery

4.Which one of the following file systems provides you quota and security?

a) NTFS b) FST c) FAT d) FAT32

5.Which one of the following filename extensions is applied by default to custom consoles that are created for the MMC?

a) . mmc b) .msc c) .con d) .mcn

Section-B **(3x2) = 06 Marks**

1.Differentiate between Workgroup & Domain.

2.What are the different editions of the Windows 2012 Server? Also specify maximum supported RAM & Processor Chip limit ?

3.Differentiate between Dedicated & Non dedicated Servers.

Section-C **(3x3) = 09 Marks**

1.What are the minimum requirements for Converting Workgroup to Domain in Windows Server Operating System. What are its advantages?

2.Describe a Client Server Network.

3.What are the network features required to establish a peer-to-peer network? Write the function of each.

Registration No.....

Bhartiya Skill Development University
School of IT & Networking
1st Semester / 1st In-Sem. Examinations
B. Voc. Program, Summer/Winter Semester (2018-19)

ITN1006 Network Devices **Time: 1 Hour**

Max. Marks: 20

Instructions: Attempt all questions.

Section-A **(5x1) =05 Marks**

1. Which one of the following provide services to client computers.

a) Workgroup b) Server c) Both d) None of them **Answer B**

2.Which one of the following is a dedicated Server?

a) Linux b) Windows c) Novell d) None of them **Answer C**

3.Which one of the following is used to remove the user credentials?

a) dsadd b) dsmod c) dsrm d) dsquery **Answer C**

4.Which one of the following file systems provides you quota and security?

a) NTFS b) FST c) FAT d) FAT32 **Answer A**

5.Which one of the following filename extensions is applied by default to custom consoles that are created for the MMC?

a) . mmc b) .msc c) .con d) .mcn **Answer B**

Section-B **(3x2) = 06 Marks**

1.Differentiate between Workgroup & Domain.

2.What is the different editions of the Windows 2012 Server? Also specify maximum supported RAM?

3.Differentiate between Dedicated & Non dedicated Servers.

Section-C **(3x3) = 09 Marks**

1.What are the minimum requirements for Converting Workgroup to Domain at Windows Server Operating System. What are the advantages of it?

2.Describe a Client Server Network.

3.What are the network features in order to establish peer to peer network? Write the function of each.

Section B

1.**Comparison of workgroup and domain:**

	Workgroup	Domain
Network type	Peer-to-peer Windows computer network	Client/server network
Log in	User needs to have separate log in id and password at each workstation	User can log on at any workstation via their account and access domain resources
Workstations	Computers are limited to maximum 10	There can be up to 2000 computers
Administrator	Each user controls the resources and security locally on their PC's	One administrator to administer the domain and its users and resources.
Location	All computers must be on the same local network or subnet.	The computers can be on different local networks, i.e. anywhere in the world.
Computer's settings	Each user controls the settings on their own computer. No central settings.	One can make only limited changes to a computer's settings because network administrators often want to ensure consistency among computers.
Changes	Each computer must be changed manually or once changed must be transferred to each computer.	Changes made to one are automatically made to all computers
Security	User needs to have separate log in id and password at each workstation, but once logged in can access the computer.	Domain users must provide a password or other credentials each time they access the domain.

2. Different editions of Windows 2012 server are: -

a. Foundation	RAM 32GB	CPU (1)
b. Essential	64GB	2
c. Standard	4TB	64
d. Datacentre	4TB	64

3. A **dedicated server** is a type of remote server that is entirely dedicated to an individual, organization or application. It is deployed, hosted and managed by a hosting, cloud or managed service provider (MSP).

A dedicated server provides functionality like an in-house server but is owned, operated and managed by the backend provider. The user/customer remotely connects with the dedicated server over the Internet to perform a suite of server based services.

A dedicated server may be used to host applications and/or services, as well as for data storage and backup services. A dedicated server also may be used internally for the hosting and provisioning of specialized services, such as implementing dedicated file or network servers.

Examples : Novell Servers

Non Dedicated Server can be used as a workstation as well besides sharing services & resources. We can work with applications on it like Windows /Linux Servers.

Section C

1) Minimum requirements for Converting Workgroup to Domain at Windows Server are:

a. Administrative Privilege

b. NTFS Partition

c. Should be in Network

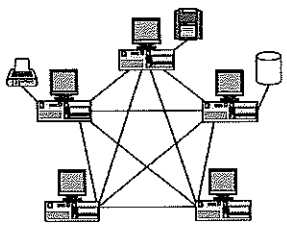
d. Static IP required

2) **Peer-to-peer Networks**

Nearly all Operating Systems come with the ability to act as some kind of a server to share resources. You can setup different computers to allow others to use its peripherals such as printers or CDROM drives, and other computers to allow others to read or write to its hard disk allowing sharing of files, while other computers may allow access to its Internet connection. When you allow workstation computers to become servers and share things in this manner, it is called a Peer-to-peer network.

Peer-to-peer networks are very cheap to implement because more than likely the Operating System software you have installed on your computers should have the ability to share items with other computers on the network, even though the feature may be limited. Nearly all of the most popular desktop Operating Systems have this feature, including Microsoft Windows and Apple's Mac OS, as well as Unix like OS es, such as Linux and the BSD s. So the only cost will be the networking hardware (cards, wiring, hubs or switches), and the labor to configure the workstations for this type of network sharing.

On a peer-to-peer network, it is also very difficult to implement a good backup system because important documents tend to be stored on different hard disks on different computers. If you do manage to implement a good backup policy, chances are great that after a while some very important documents will not get archived because someone "accidentally" saved them to the wrong location on the network.

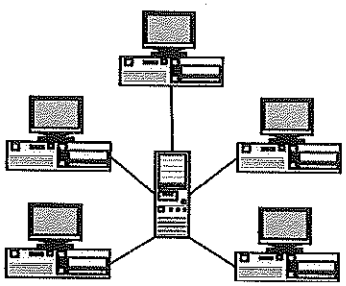


Peer-to-peer networks can be implemented with very little investment costs, but in order for the network to work properly, the users must be very experienced with computers, and strict guidelines must be implemented and followed in order for the data to remain secure and archived properly. In my experience, peer-to-peer networks tend to become more of a headache instead of a help after about 6 computers, especially if your company has a moderate employee turnover.

The **Client-Server network model** usually consists of one or more server computers that provide services and information to a number of workstation computers. These services can consist of many different roles, including: file services, web services, email services, domain name lookup services, document version system services, Internet sharing services, etc. A great example of the Client-Server

network model is actually the World Wide Internet. On the Internet clients, or computer with web browsers, access web sites that are hosted on servers.

With the Client-Server network model, each workstation only really needs to have one theoretical connection on the network, and that connection is to the main server as illustrated in the image below. Because of this, the maintenance cost for the network drops. Also, since all the important information of the network actually resides on the servers, the workstation maintenance also drops since the users can access any information they need through any workstation, and a faulty workstation computer will have very little effect on the usefulness of the network. I actually have setup networks where the workstation computers are backed up to an image on a central server, so if a workstation goes down, a technician can restore the image and have the workstation back up literally within minutes.



The Client-Server network model provides important services to the network safely and securely, it also allows the convenience of allowing the users to work on their own workstation machine. However, this network model can be very expensive, not only because the software can be expensive, but you also must provide adequate hardware for both the servers and the individual workstation machines, which can become very expensive with revolving hardware updates.

If you have the funds to implement this type of network, the return on the investment is great, and you will have the knowledge that your network is well secured and archived.

3. Network features in order to establish peer to peer network: -

a. Network Adapter required for basic connectivity.

b. Client provide access to computers files on the network you are connecting to. Example Microsoft

c. Protocol is rules & regulations used to communicate with other computers Example TCP/IP

d. Service provide features such as file & printer sharing.

Registration No.....

Bhartiya Skill Development University
School of IT & Networking
1st Semester / 1st In-Sem. Examinations
B. Voc. Program, Summer/~~Winter~~ Semester (2018-19)

ITN1301 Network Devices Management

Time: 1 Hour

Max. Marks: 20

Instructions: Attempt all questions.

Section-A

(5x1) =05 Marks

1. Which one of the following provides 1000Mbps Speed in a network?

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

2.Which one of the following is the number of bit in the MAC address of NIC?

a) 32 b) 48 c) 64 d) 128

3.Which one of the following is a Physical layer device?

a) Hub b) Repeater c) Media Convertor d) All of These

4.Which one of the following devices control the Broadcast traffic?

a) Switch b) Router c) Hub d) Bridge

5.Which one of the following is the number of hosts with /29 network?

a) 2 b) 6 c) 14 d) 30

Section-B

(3x2) = 06 Marks

1.Differentiate between Half & Full Duplex communication.

2.What are the uses of Console Cable and Media Convertor?

3.Differentiate between Managed & Unmanaged Switches.

Section-C

(3x3) = 09 Marks

1.Calculate the following for a network given by 192.168.4.44/27

Hosts, Subnets, Valid Hosts, Broadcast ID, Block Size

2. Define the following with their functions: Hub, Switch, Router.

3. What are the router components & Boot Sequence?

Registration No.....

Bhartiya Skill Development University
School of IT & Networking
1st Semester / 1st In-Sem. Examinations
B. Voc. Program, Summer/Winter Semester (2018-19)

ITN1301 Network Devices Management **Time: 1 Hour**

Max. Marks: 20

Instructions: Attempt all questions.

Section-A **(5x1) =05 Marks**

1. Which one of the following provide 1000Mbps Speed in a network?

a) LAN b) MAN c) WAN d) PAN **Answer A**

2.Which one of the following bit is of MAC address of NIC?

a) 32 b) 48 c) 64 d) 128 **Answer B**

3.Which one of the following are Physical layer devices?

a) Hub b) Repeater c) Media Convertor d) All of These **Answer D**

4.Which one of the following devices control the Broadcast traffic?

a) Switch b) Router c) Hub d) Bridge **Answer B**

5.Which one of the following is the number of hosts with /29 network?

a) 2 b) 6 c) 14 d) 30 **Answer B**

Section-B **(3x2) = 06 Marks**

1.Differentiate between Half & Full Duplex.

2.What are the use of Console Cable, Media Convertor?

3.Differentiate Manage & Unmanaged Switch.

Section-C **(3x3) = 09 Marks**

1.Calculate the Following for network 192.168.4.44/27

Hosts, Subnets, Valid Hosts, Broadcast ID, Block Size

2. Define the following with functions Hub, Switch, Router.

3. What are the router components & Boot Sequence?

Section B

1.Comparirion between Half & Full Duplex

	Half Duplex	Full Duplex
Direction of Communication	Communication is two-directional but, one at a time.	Communication is two directional and done simultaneously.

Send/Receive	A sender can send as well as receive the data but one at a time.	A sender can send as well as receive the data simultaneously.
Performance	The full duplex mode yields higher performance than half duplex.	Full duplex has better performance as it doubles the utilization of bandwidth.
Example	Walkie-Talkies.	Telephone.

2. The Console Cable is used for the serial connection between your computer's serial port and the console port on our manages switch or router to access the CLI (Command Line Interface) of the device.

A fiber **media converter** is a simple networking device that makes it possible to connect two dissimilar **media** types such as twisted pair with fiber optic cabling. ... They are also used in metropolitan area network (MAN) access and data transport services to enterprise customers.

3. Managed Switches are designed to deliver the most comprehensive set of features to provide the best application experience, the highest levels of security, the most precise control and management of the network, and offer the greatest scalability in the Fixed Configuration category of Switches. As a result, they are usually deployed as aggregation/access switches in very large networks or as core switches in relatively smaller networks. Managed switches should support both L2 switching and L3 IP routing though you'll find some with only L2 switching support.

Unmanaged category of switch is the most cost effective for deployment scenarios that require only basic layer 2 switching and connectivity. As such, they fit best when you need a few extra ports on your desk, in a lab, in a conference room, or even at home. With some Unmanaged switches in the market, you can even get capabilities such as cable diagnostics, prioritization of traffic using default QoS settings, Energy savings capabilities using EEE (Energy Efficient Ethernet) and even PoE (Power Over Ethernet). However, as the name implies, these switches generally cannot be modified/managed. You simply plug them in and they require no configuration at all.

Section C

1. Hosts, Subnets, Valid Hosts, Broadcast ID, Block Size 192.168.4.44/27

   Subnets = 8

   Hosts = $(2)^5$-2=30

   Block Size= 256-224=32

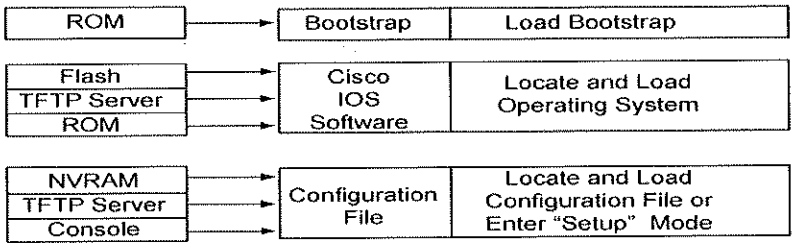
Network ID	**Valid ID**	**Broadcast ID**
192.168.4.0	1 to 30	192.168.4.31
192.168.4.32		
192.168.4.64		

192.168.4.96	97 to 126	192.168.4.127
192.168.4.128		
192.168.4.160		
192.168.4.196		
192.168.4.224	225 to 254	192.168.4.255

2. Hub	Switch	Router
a.Physical Layer device	Data Link layer device	Network layer device
b.Single Broadcast & Collision Domain	Single Broadcast & multiple Collision Domain	Control Broadcast Domain
c.Transmit packets to all.	Trasmit to definite machine	Controlled to packets
d. Its obsolete	Used in most of industry	Used in industry as per requirement
e. Limited no. of ports 5,8,16	Ports are 8,16/24/48 etc	Ethernet ports are normally 2.Can be extended as per requirements.

3.Components of Router are:-
i) Processor
ii) ROM
iii) RAM
iv) Flash
v) NVRAM
vi) Configuration Register

Boot sequence
The router requires all the router components during its boot up :-



Registration No.: .....

BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of IT/Networking Skills

3rd Semester, 1st In-Sem. Examination

B. Voc. Program, ~~Winter~~ SUMMER Semester (2018-19)

ITN1302 Wireless Networks

Time: 1 Hour

Max. Marks: 20

Instruction: Attempt all questions.

Section – A

05x01 = 05 Marks

1. Which one of the following layer performs Segmentation and Reassembling in OSI model?
   a) Application Layer b) Transport Layer
   c) Data Link Layer d) Network Layer
2. Which one of the following IEEE standard belongs to WLAN?
   a) 802.11 b) 802.15
   c) 802.5 d) 802.16
3. Which one of the following multiple access technique is currently being used for Wireless LAN?
   a) CSMA b) ALOHA
   c) CSMA/CA d) CDMA
4. WPA stand for which one of the following?
   a) Wi-Fi Protected Access b) Wired Protected Access
   c) Wi-Fi Process Access d) Wired Process Access
5. The communication management services to wireless workstations is performed by which one of the following device?
   a) Access Point b) Wireless Adaptor
   c) Repeater d) Antenna

Section – B

03x02 = 06 Marks

1. What are the differences between a router and an access point?
2. What is WLAN. List all the IEEE 802.11 WLAN standards.
3. What type of devices are required to create a WLAN?

Section – C

03x03 = 09 Marks

1. Explain the basic access point configuration process to access it on webpage.
2. What are the steps to configure DHCP in a Wireless Router?
3. What is the hidden terminal problem? What is the solution to address the problem?

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School of IT & NETWORKING

3rd Semester IST In-Sem. Examination

B. Voc. Program, Winter Semester (2018-19)

Course Code: ITN1302 **Time: 1 Hour**

Course Name: Name: Basics of Network Security **Max. Marks: 20**

Instruction: Answer All Questions

Section – A

05X01 = 05 Marks

Q1 Which one of the following is a computer network?

a. A super computer owned only by the government

b. A web of connected computers or devices

c. A computer vulnerability

d. All of the above

Q2 Which one of the following is the reason for the size and the complexity of networks growing enormously?

a. Only Government and Universities owned computers

b. Spamware caused some computers to break down

c. The number of personal computers greatly increased

d. Hackers started using the internet

Q3 Which one of the following is a passive attack?

a. Eavesdrop

b. Impersonation

c. Replay

d. Intercept & modify

Q4 Which one of the following is an active attack?

a. Intercept & modify

b. Replay

c. Impersonation

d. All of the above

Q5 Which one of the following is a security services?

a. Confidentiality (privacy)

b. Authentication (who created or sent the data)

c. Integrity (has not been altered)

d. All of the above

Section – B

03X02 = 06 Marks

Q1 What is a Passive attack? Give an example.

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Ans. A passive attack is a network attack in which a system is monitored and sometimes scanned for open ports and vulnerabilities. The purpose is solely to gain information about the target and no data is changed on the targetatermarks are text or pictures that appear behind document text., Ex. eavesdrop, pattern analysis.

Q2 What is an Active attack? Give an example.

Ans. An active attack is a network exploit in which a hacker attempts to make changes to data on the target or data en route to the target. Ex- DDOS, Replay.

Q3 Write down any two security services.

Ans. Confidentiality and Integrity.

Section – C

03X03 = 09 Marks

Q1 What is malware, virus and worms?

Ans1. Malware, or malicious software, is any program or file that is harmful to a computer user. Malware includes computer viruses, worms, Trojan horses and spyware.

A virus is the most common type of malware, and it's defined as a malicious program that can execute itself and spreads by infecting other programs or files.

A worm is a type of malware that can self-replicate without a host program; worms typically spread without any human interaction or directives from the malware authors.

Q2 What are the three pillars of the network security?

Ans2. Availability, integrity and confidentiality

Q3 What do you mean by Authentication, Authorization and Social Engineering?

Ans3. **Authentication** is the process of determining whether someone or something is, in fact, who or what it declares itself to be. Authentication technology provides access control for systems by checking to see if a user's credentials match the credentials in a database of authorized users or in a data authentication server.

Authorization is the process of giving someone permission to do or have something. In multi-user computer systems, a system administrator defines for the system which users are allowed access to the system and what privileges of use (such as access to which file directories, hours of access, amount of allocated storage space, and so forth).

Social engineering is essentially the art of gaining access to buildings, systems or data by exploiting human psychology, rather than by breaking in or using technical hacking techniques. For example, instead of trying to find a software vulnerability, a social engineer might call an employee and pose as an IT support person, trying to trick the employee into divulging his password.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

School of IT & NETWORKING

3rd Semester I[ST] In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

ITN1303 Basics of Network Security — Time: 1 Hour

Instruction: Answer All Questions — Max. Marks: 20

Section – A

05x01 = 05 Marks

Q1. Which one of the following is a computer network?

a. A super computer owned only by the government
b. A web of connected computers or devices
c. A computer vulnerability
d. All of the above

Q2. Which one of the following is the reason for the size and the complexity of networks growing enormously?

a. Only Government and Universities owned computers
b. Spamware caused some computers to break down
c. The number of personal computers greatly increased
d. Hackers started using the Internet

Q3. Which one of the following is a passive attack?

a. Eavesdrop
b. Impersonation
c. Replay
d. Intercept & modify

Q4. Which one of the following is an active attack?

a. Intercept & modify
b. Replay
c. Impersonation
d. All of the above

Q5. Which one of the following is a security service?

a. Confidentiality (privacy)
b. Authentication (who created or sent the data)
c. Integrity (data has not been altered)
d. All of the above

Section – B

03x02 = 06 Marks

Q1 What is a Passive attack? Give two examples.

Q2 What is an Active attack? Give two examples.

Q3 Describe any two security services.

Section – C

03x03 = 09 Marks

Q1 Explain the terms malware, virus and worms.

Q2 What are the three pillars of the network security? Explain.

Q3 What do you understand by Authentication, Authorization and Social Engineering? Explain.

Registration No: .....

SCHOOL OF IT (Networking)

III SEM, FIRST IN-SEMESTER EXAMINATION – 2018

SUMMER SEMESTER, B. VOC. PROGRAM

ITN1304 Linux/Red Hat Administration **Time: 1 Hour**

Max. Marks: 20

Instructions: **Attempt all questions.**

Section-A Objective Type Questions **(5x1) Marks**

State whether the following statements are **TRUE** or **FALSE**:

i. Linux operating system is free but Red Hat is not free.

ii. Brian Kernighan and Denis Ritchie developed the Linux kernel.

iii. Linux file system is a hierarchical file system.

iv. The information about all the files and directories is maintained in FILE ALLOCATION TABLE (FAT).

v. The characters ? and * cannot be used in Linux.

Section-B Short-Answer Type Questions **(3x2) Marks**

1. What are index nodes (INODES)? Explain their function.
2. List any three distributions of Linux Operating System.
3. What is the function of "chown" command? Explain with examples.

Section-C Essay Type Questions **(3x3) Marks**

1. Explain briefly the Access Permissions in Linux, for different categories of users.
2. How can file and directory access permissions be modified using octal notation?
3. What is a swap partition and why is it created? What is the thumb rule for determining the size of the swap partition?

Registration No: .....

SCHOOL OF IT (Networking)

FIRST IN-SEMESTER EXAMINATION – 2018

SUMMER SEMESTER, B. VOC. PROGRAM

1304

ITN1104 Linux/Red Hat Administration **Time: 1 Hour**

Max. Marks: 20

Instructions: **Attempt all questions.**

Section-A Objective Type Questions **(5x1) Marks**

State whether following statements are **TRUE** or **FALSE**:

i. Linux operating system is free but Red Hat is NOT free. **TRUE**
ii. Brian Kernighan and Denis Ritchie developed the Linux kernel. **FALSE**
iii. Linux file system is hierarchical file system. **TRUE**
iv. The information about all the files and directories is maintained in FILE ALLOCATION TABLE (FAT). **FALSE**
v. The characters ? and * can not be used in Linux. **FALSE**

Section-B Short-Answer Type Questions **(3x2) Marks**

Q1. What are index nodes (INODES)?
Answer:

The information about all the files and directories is maintained in INODE TABLE. An Inode (Index Nodes) is an entry in the table containing information about a file (metadata) including file permissions, UID, GID, size, time stamp, pointers to files data blocks on the disk etc.

Q2. List any three distributions of Linux Operating System.
Answer:

Some of the distributions of Linux are:

i. Caldera
ii. Red Hat Enterprise Linux
iii. Kali Linux
iv. Fedora
v. Slackware
vi. Debian etc.

Q3. What is the function of "chown" command? Explain with examples.
Answer:

chown command is used to change the ownership of the file or directory. The general format of the command is given below:

chown <owner> <file/directory name>. For example to change the ownership of /home/tanuj directory from user tanuj to vikram following command is used:

chown -R vikram /home/tanuj

Here, -R flag is used to change the ownership recursively.

Section-C Essay Type Questions **(3x3) Marks**

Q1. Explain briefly Access Permissions in Linux for different categories of users.
Answer:

In UNIX/LINUX, there is a concept of user and an associated group. The system determines whether or not a user or group can access a file or program based on the permissions assigned to them. Super User or the root has permission to access any file and directory. There are three permissions for any file, directory or application program as below:

r — Indicates that a given category of user can read a file.
w — Indicates that a given category of user can write to a file.
x — Indicates that a given category of user can execute the file.

Each of the three permissions are assigned to three defined categories of users. The categories are:

owner — The owner of the file or application.
group — The group that owns the file or application.
others — All users with access to the system.

Q2. How file and directory access permissions can be modified using octal notation?
Answer:

The permissions of the file or directory can be changed using **chmod** command

chmod -R ### <filename or directory>

-R is optional and when used with directories will traverse all the sub-directories of the target directory changing ALL the permissions to ###. The #'s are octal numbers and their value can be:

0 = Nothing (No permission)
1 = Execute
2 = Write
3 = Execute & Write (2 + 1)
4 = Read
5 = Execute & Read (4 + 1)
6 = Read & Write (4 + 2)
7 = Execute & Read & Write (4 + 2 + 1)

Q3. What is swap partition and why it is created? What is the thumb rule for determining the size of the swap partition?
Answer:

Swap partitions are used to support virtual memory. Swap space in Linux is used when the amount of physical memory (RAM) is full. If the system needs more memory resources and the RAM is full, inactive pages in memory are moved to the swap space. While swap space can help machines with a small amount of RAM, it should not be considered a replacement for more RAM. Swap space is located on hard drives, which have a slower access time than physical memory.
Swap space can be a dedicated swap partition (recommended), a swap file, or a combination of swap partitions and swap files.

The thumb rule for determining the size of the swap partition is that the swap should equal 2x physical RAM for up to 2 GB of physical RAM, and then an additional 1x physical RAM for any amount above 2 GB, but never less than 32 MB.

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BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Question Paper

School of IT/Networking Skills

3rd Semester, 1st In-Sem. Examination

B. Voc. Program, Summer Semester (2018-19)

Course Code: ITN1305 **Time: 1 Hour**

Course Name: Optical Fiber Communication **Max. Marks: 20**

Section – A

Objective type questions, each question carries 01 mark. 05x01 = 05 Marks

Q. 1 Which one of the following is the core size of single mode optical fiber?

A. 8.3 microns B. 50 microns C. 62.5 microns D. 125 microns

Q. 2 Which one of the following wavelength range is used in optical fibers?

A. Between 850nm and 1300nm B. Between 850nm and 1550nm

C. Between 850nm and 1625nm D. Between 750nm and 2500nm

Q. 3 Which one of the following component carries the signals in optical fibers?

A. Cladding B. Buffer C. Core D. Strength member

Q. 4 Which one of the following is the single fiber non-contact connector?

A. ST B. LC C. D4 D. BICONIC

Q. 5 Which one of the following is the most widely used optical fiber connector?

A. SC B. LC C. ST D. FC

Section – B

Short answer type questions, each question carries 02 marks. 03x02 = 06 Marks

Q. 1 What is optical fiber communication? What is the theory of behind the optical signal transmission?

Q. 2 Write the advantages and disadvantages of optical fiber over other medias.

Q. 3 What is the difference between buffer and strength member?

Section – C

Essay type questions, each question carries 03 marks. 03x03 = 09 Marks

Q. 1 What is a connector? Explain its different components with a diagram.

Q. 2 Describe the components in a fiber-optic cable.

Q. 3 Explain the different types of single fiber contact connectors.

School of IT/Networking Skills

3rd Sem, 1st In-Sem Examination

Answer Key

Course Code: ITN3005 1305

Course Name: Optical Fiber Communication

Section A

Qué 1) A 8.3 microns

Qué 2) B Between 850nm and 1550nm

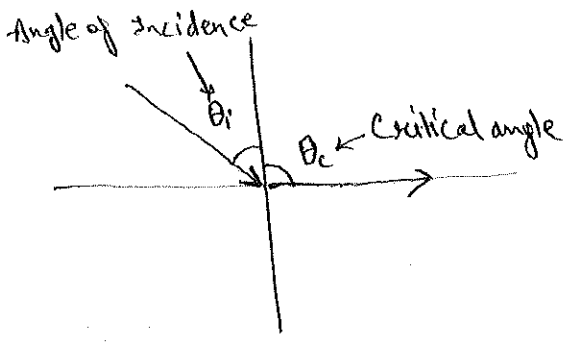
Qué 3) C Core

Qué 4) D BICONIC

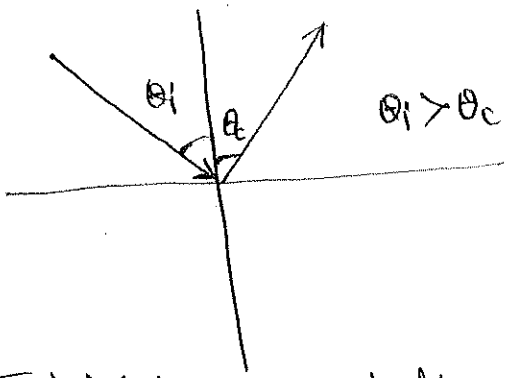
Qué 5) A SC

Section B

Qué 1) Ans. Fiber optic media are any network transmission media that use glass, or in some special cases, plastic, fiber to transmit network data in the form of light pulses. Fiber optic technology is different in its operation than standard copper media because the transmissions are digital light pulses instead of electrical voltage transmissions.



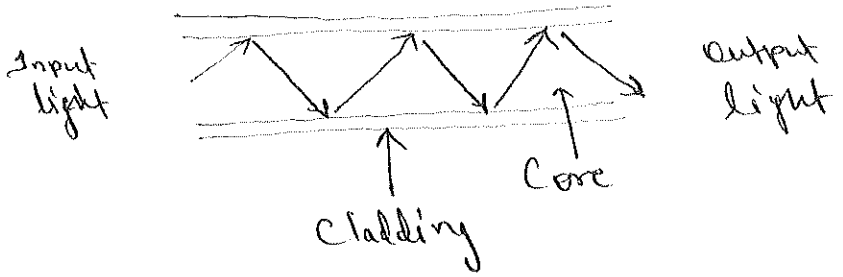
Refracted ray on interface



Total internal reflection

If the incident angle increases more than critical angle, then the refracted ray falls on the same denser medium with no

reflection. this reflection of light is called total internal reflection.



The theory of behind the optical signal transmission is "total internal reflection".

Qui 2.)

Ans Advantages of optical fibers

- Immunity to electromagnetic interference
- Higher data rates
- Longer maximum distances
- Better security

Disadvantages of optical fibers

- Cost
- Installation

Qui 3.)

Ans. Buffer :- The Buffer provides additional protection for the optical fibers inside the cable. The buffer does just what its name implies: it buffers, or cushions, the optical fiber from the stresses and forces of the outside world. Optical fibers are categorised as either

1) Tight buffer
2) Loose buffer.

Tight buffer make the entire cable more durable, easier to handle, and easier to terminate. Tight buffered cables

are most often used indoors because expansion and contraction caused by outdoor temperature swings can exert great force on a cable. A loose tube design is very effective at absorbing forces exerted on the cable so that the fiber strands are isolated from the damaging stress.

Strength Member: The strength member of a fiber optic cable is the part that provides additional tensile (pull) strength. Strength element can also provide compression resistance. It provides additional support to prevent breakage of the delicate optical fibers within the cable while pulling them into place.

Section C

Que 1)

Ans. Connector The job of a connector is to couple an optical fiber end mechanically to a piece of equipment or to another optical fiber so that the cores line up accurately and produce the smallest amount of loss.

Inherent in this requirement is the need for the connector to protect the fiber from repeated handling during connection and disconnection, align the fiber end precisely with its counterpart in the interconnection, and prevent strain on the fiber itself.

Connector Components The connector has four components:

1) Ferrule
2) Cap
3) Body
4) Strain Relief

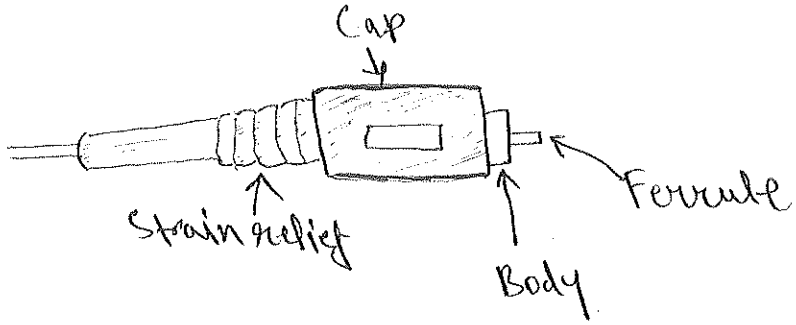


Fig. Fiber optic connector components

- Beginning at the working end of the connector, the ferrule holds the fiber in place. The ferrule must hold the fiber exactly centered in its endface for the best possible connection.
- The cap, sometimes called coupling nut, fits over the body of the connector and provides a means to secure the connector.
- Depending on the connector type, the cable jacket may or may not be securely fastened to the connector body.
- A strain relief is typically placed over the cable jacket and secured to the connector body.

Qui 2.7

Ans. Fiber-optic cable components:

A typical fiber-optic cable consists of several components:

- Optical fiber strand
- Buffer
- Strength members
- Optional shield material for mechanical protection
- Outer jacket

optical fiber strand: An optical fiber strand is the basic element of a fiber-optic cable. All fiber strands have atleast three components to their cross sections:

1) The Core
2) The Cladding
3) The Coating

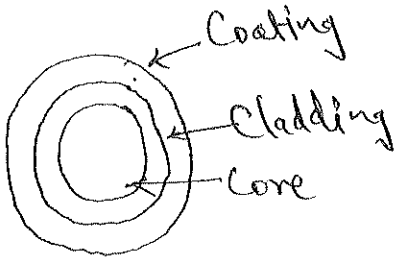


fig. Fiber optic strand

Buffer: The buffer, the second-most distinguishing characteristic of the cable, is the component that provides additional protection for the optical fibers inside the cable. There are two types of buffers:

1) Tight buffer – for indoor applications
2) Loose buffer – for outdoor applications.

Strength member: Fiber-optic cables require additional support to prevent breakage of the delicate optical fibers within the cable while pulling them into place. The most common strength member in tight-buffered cables is aramid yard, the same material found in bulletproof vests.

Shield Materials: The shield is often referred to as armor. A common armoring material is steel with a special coating that adheres to the cable jacket.

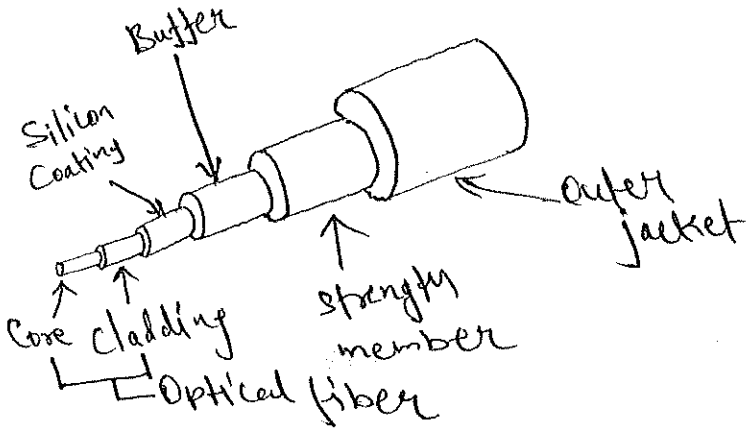


fig. fiber optic cable components

Cable jacket: The cable jacket of a fiber-optic is the outer coating of the cable that protects all the inner components from the environment. It is usually made of a durable plastic material and comes in various colours.

Qu? 3)

Ans. Single-fiber contact connectors:

Single fiber contact connectors have a wide variety of connection methods. Single-fiber connectors are designed for only one optical fiber. The endface of contact type connectors, regardless of the endface geometry, physically touch when mated.

There are different types of single-fiber contact connectors.

1) SC (Standard Connector)

- Mostly widely used connectors.
- 2.5mm ferrule
- Push-in connection and rectangular D-shaped.

2) LC (Lucent Connector)

- The LC connector is a small form factor fiber optic connector.
- 1.25mm ferrule
- Push-in connection and square-shaped

3) FC (Ferrule connector)

- 2.5mm ferrule
- Screw-on connection and round shaped metal connector.

4) ST (Straight Tip)

- Metal connector cap
- ST connectors are among the most commonly used fiber optic connectors in networking applications.
- Twist lock connection and round shaped
- 2.5mm ferrule

5) D4

- Older style connector
- 2.5mm ferrule
- Screw-on connection and round shaped

6) BNC (Bayonet Nut Connector)

- Older type connector
- 2.5mm ferrule
- Twist lock connection and round shaped