bc

a) As an IT manager of prestige systems you are required to have a discussion with an internet service provider for a bandwidth provision. Set out the details of the service you require.

b) You have been contracted by the company known as prestige systems to advise them on whether to use a fibre optic cable or a category 5 UTP for their network. Give out your advice on which of the cables to use and why.

c). Explain how data is transmitted within a ring Topology and a star Topology and list the advantages and disadvantages in each case.

d). explain how data is transmitted within the mesh topology network and state the advantages and disadvantages of using this type of topology.

e) Differentiate between a baseband and a broadband

f) what is the difference between a bridge and a gateway

2)

a. As an IT expert you have been consulted by Drones securities, a financial institution, to advice on the need to use wireless as the transmission medium for their office premises. Set out your advice on why the company should go wireless and state the advantages and disadvantages of the usage of the wireless as a transmission.

b. different between a broadcast and a multicast transmission

c. what is the difference between a hub and a switch

d. what is the difference between a mail server and a web server in a network

3).

a). you have been contracted by MATRIX MICHELLE an IT company to network their office premises which is 50m X 30m and it is supposed to house 40 computers, 4 network printers and a suitable number of switches and servers. Give a brief account on how you will

a. Carry out an analysis of the entire project
b. Design the network using appropriate topology and equipment required and reasons for choosing that topology and equipment
c. Advice the client on whether to use wireless or wired network

3b) explain why sub-netting is needed when allocating IP address in general networking processes.

ii) A CLASS C IP address has the structure 192.0.0.0 to 233.255.255.255. Explain the significance of the structure 192.0.0.0 to 233.255.255.255

iii) In a local network the IP address given by the service provider is a Class C IP address which is 192.168.20.1. However the company has 500 computers (as clients) and 10 servers. Subnet the entire network and work the IP addresses of the first 100 computers.

21st Nov.

1. Routing delay from a sauce to destination depends on the band width of the intermediate network link

2. Path length and bandwidth are some of the matrics used by routing protocols.

3. Demodulation is a means for extracting data from an analoque / digital from a source to a destination

4. A series of bits containing data and control information including source and destination node address formatted 4 transmission from one node to another are serially transmited signals.

5. A bridge device
- Filters data traffic at the network boundary
- Operates at the data link Layer of the OSI model.

6. Parity bit is added to a data packet for the purpose of Error detection.

7. The strength of an analoque signal is normally reduced after transmission through a long distance. this signal can be boosted up to it original strength by a repeater

8. The physical layer provides connectivity beween network devices.

9. The function of the transport layer includes:
- communication with session layer
- detect errors and prevent data loss
- management of connectivity and routing between host and the network.

10. The session layer performs functions as
- Organised and manage one or connections per application bln hosts.

11. The fxn of é presentation layer includes Transmission of data from cross platform standards into formats understood by the local machine.

12. The point - to - point protocol can be used to authenticate ~~servers~~.

13. A major source of jitter noise lies in the Process of digital regeneration through repeater

14. A transmitted signal that has been groomed will contain signals of the type and free from empty packets.

15. When signals are transmitted through a concentrator Empty space bln the data packet are removed.

16. Which of éff can't cos a routing delay when signals are transmitted. The type of multiplexing technique used.

17. In multicast transmission, the message is directed to
A group of host that can choose to participate

18. Network Bridge
Reduces the size of the collision by micro segementation in a non switched networks

19. The data link layer is concerned with fragmentation of data into frames.

20. The presentation layer performs fxns such as Translation of data configuring 2 cross platform standards into format understood by é local machine.

21. A simple mode optical transmission has a separate distinct refractive idexes 4 é cladding and the core.

22. immunity to noise on the transmission medium is an advantage of using a FM signal transmission

23. The degree of noise reduction in a twisted pair cable (shielded and unshielded) is determined by the number of turns pair meter.

24. An unshielded twisted pair cable is used on Ethernet 10Base T cabling System.

25. A step-index which is an optical transmission mode has a large core and some of ẽ light rays reflects off the cladding and others take a direct path

26. In a graded index optical transmission mode The light rays are gradually ↄ the core path due to gradual change in ẽ core refractive index.

27. Dynamic routing uses routing protocols which enable è router
- Reach agreement with other routers abt ẽ network topology.
- calculate routes
- distribute routing update to other routers.

28. In a router transmission hold-down timers use triggered updates ↄ reset the hold-down timer when Another update is recieved indicating ẽ network status has changed.

29. An optical fiber cable has noise immunity to radio frequency interface (RFI) and electromagnetic interface (EMI)

30. The physical vibration showing up as a signal noise is a disadvantage ϕ using an optical fiber cable

31. Signal transmission by AM radio is an eg of Satellite propagation grounded

32. Ionosphere propagation operates in ē frequency range of 30MHz - 85MHz

33. Microwaves operate at high frequencies of 3MHz - 10MHz due to large bandwidth.

34. Microwaves can carry large quantity of information because they operate at high frequencies..

35. Satellights can carry high quality of information because they are placed in the orbit of the earth.

36. Footprint is the shadow that a satelite transmits.

37. In message switching, it is not necessary to establish a dedicated line

38. Which of the following is not part of ē switching process is PSTN interference from external

39. The communication between a satelite in space and a receiver on earth is an example of a full duplex and multicast transmission.

40. The communication bln a radio station and their listeners is an example of Sunplex transmission

41. A serial transmission conveys message in one bit at a time.

42. A carrier frequency of a signal is chosen 4persons such as a andb (signal bandwidth and signal frequency spectr...

43.

44

45

43. In a source route bridging single-route frames are used to make up most of the network traffic while all-route frames are used to find routes.

44. Frequency modulation is less affected by noise and it is preferable to amplitude modulation because info is contained in frequency and phase

45. In a message switching process it is not necessary to establish dedicated line.

46. Signals undergoing circuit switching doesn't require repeaters.

47. Which of the following is not a disadvantage of transmitting signals using a microwave?
it is affected by cross talk.

48. microwave transmission is a line of sight transmission ∴ the transmit station must be in visible contact with the receive station

49. Signal communication bln a radio station and listners

44. A host ID field has 5 bits. Calculate the total usable IP addresses that can be obtained
30

45. Cross-over cabling allows
2 computers to be connected without é need of a hub or switch.

46. In CAT 5 cross over pin outs
only pins 1, 2, 3, 6 are used effectively

47. The main disadvantage of a star network is that the whole network breaks down when the central hub breaks down.

48. In connecting 2 hubs, no crossover cabling is needed because
One hub is connected through an uplink port of another

49. 100 Base TX/T4 works for
100 Mbits network only and uses unshielded twisted pair cable with RJ 45 connectors at each end.

50. Ethernet uses the lowe order of the high order octet to distinguish conventional addresses from multicast addresses.

Section B.

The aerial height of a parabolic dish of diameter 1.6m placed on top of a building is 100m above sea level. It is required to transmit signals from this dish to another Accra also with an aerial height of 160m and a diameter of 1.6m. Calculate the range between 2 dishes.

Calculate the signal gain 'G' for each of the 2 dishes. Take the factors that takes in consideration curvature of earth = 1.33 and wavelength = 1.8.

Soln

$$G = D/\lambda$$

where G = gain
D = diameter
λ = wavelength.

$$d = 7.14 (kh)^{1/2}$$

where d = range
k = factor to take into acct (curvature) = 1.33
h = aerial height

1st Part	2nd Part
d = 1.6m	d = 1.6m
h = 100m	h = 160m

range (d) I = $7.14 (1.33 \times 100)^{1/2}$

= $7.14 (1.33 \times 60)^{1/2}$

= 63.782 m

$\therefore G_{1/2} = \frac{1.6}{1.8} = 0.889$ m

Explain
Time div

Explain what meant by the term Time division multiplexing and carrier frequency as used in D C.

Time division multiplexing is the time available for transmission is subdivided into separate time slots with each slot 4 I channel of communication. TDM is used 2 provide high density transmiselon.

Carrier frequency : is a single frequency used 2 carry the intelligence of data or a frequency bearing signal that carries & inpo bearings.

State 4 advantages & 4 disadvantages of Using wireless as transmission medium.

Adv.

- it is convenient, easily setup n disassembled
- it is easy To install
- no need 2 run cables in e building.
- Transmission speed is very high
- it is very versatile such that U can move abt without restricts.
- Reduction of cables reduces e trip hazard caused by cables running along the floor.

Dis adv.

- unreliable and security, it easy 2 hack
- Very expensive
- increased jamming n
- Signal interference by external factors by weather.
- Limited bandwidth, hence can't support video Teleconferencing
- it is also limited in its expandability due 2 e lack of available wireless sectrum 4 it 2 occupy

2a. A low frequency signal was transmitted from a source 2 a destination utilizing 55 repeaters whose power density was 20 idatts. If è bandwidth of è channel was 4M Calculate è root mean square of è jitter in è transmitted signals.

Soln.

(R.M.S) Root mean Square jitter = $((PMB)/2)^{1/2}$ for N>100

P = Power density = 20 idatts

M = No of repeaters = 55

B = Bandwidth = 4M

$= ((20 \times 55 \times 4)/2)^{1/2}$

$= 46.904$ //

2b. diff bln Frequency division multiplexing & time division multiplexing.

FDM	TDM
FDM is a scheme in which numerous signals are combined 4 transmission on a single communications lines or channel.	TDM is the time available For transmission is subdivid into separate time slot with each slot 4 1 channel of com
Each signal is assigned diff frequency within è main channel.	TDM is used 2 provide high density transmission,

Data Communication 20th November 2015

① The disadvantage of network group includes Helps minimize bandwidth size

② On a typical LAN the wire distance from a computer to the wall jack is likely to be 100m.

③ Token passing is best suited for time sensitive environments only.

④ The process of polling involves Primary device ask the secondary devices in sequence whether they have data to send.

⑤ The ~~dis~~advantages of polling includes allows all computers equal access to the channel.

⑥ The disadvantage of polling includes Primary device failure causing network failure.

⑦ On a sever based network A single password for network log-on delivers access to all network resources.

8. Communication severs Permit network users to access the external resource not directly attached to the network

9. Signal bounce occurs when a bus network is not terminated.

10. The following syntax can be used to scan a multiple host using Nmap in a Redhat Linux environment ∂ determine ê Os of ê target
Nmap -O 192.168.100-110

11. Fibre Optic Cables.
Uses pulse of light sent along a straight conducting fibre at the heart of cable for the transmission of information.

12. Active hubs recieves signals from a port regenerates the signal and send it down to all the other ports.

13. ATM requires a dedicated circuit b/n 2 end systems and also uses connection-oriented switches ∂ permit sender and recievers to communicate over a network.

14 To access any network, computers must attach to the network medium with a physi interface such as Network Interface Card (NIC)

15 Network Operating system (NOS) are specialized collection of software that give a computer the ability to communicate over the network and take advantage of networking services.

16 The disadvantage of a sever - based network includes

A sever failure renders a network not usable at best, it results in loss of network resources.

17 The disadvantage of a peer to peer network Each machine must be backed up individually to protect all shared data.

18 Fibre Optic cables eliminates the possibility of electronic eavesdroping

A. The application layer of é OSI model Handles general network access, flow control and error checking.

20 The presentation layer handles protocol conversion, data encryption / decryption, character set issues and graph command.

21. The purpose of bridges are the following:
- manages network traffic by filtering Packets.
- Translates from one protocol to another
- identify IP address.

22. The purpose of a router is to connect nodes across an internetwork regardless of é physical layer and data link layer protocol that is used.

23. Routers are hardware and IP address independent

24. A gateway may contain devices such as
Protocol translators
Impedence matching devices
Rate converters
Fault isolators.
Signal translators as necessary to provide system interoperability

25. Routers are not aware of the type of antivirus in a network.

26. In a source routing, the source is responsible for determining the best path of é destination.

27. The most common application 4 a straight through cable connection is
Between a PC and a hub/switch.

28. The network interface card (NIC)
establishes and manages é comp. network connection.

29. Parallel transmission involves spreading individual bits of data one across the multiple, parallel data lines & transmit them in serial transmission

30. Choosing network adapter card requires considering other hardware-enhancement options & help improve overall network.

31. In a client / sever network certain computers take specialized roles and fxn mostly as servers

32. Communication severs Provide access to network resources 4 users not directly attached 2 ê network.

33. Laser-based LAN technologies require a clear line of sight b/n receiver and sender.

34. Infrared LANs include
Line of sight networks
Reflective wireless networks
Scatter infrared networks
Broad band optical tele point networks

35. A multimode fibre cable incorporate or more glass fibre at ê core.

36. On a network each computer can be det by IP address.

37. The advantage of a network bridging includes
- self collision
- reduce é size of collision domain
- transparent to protocols above e MAC-layer

38. How do you check to see if 2 nodes A and B in a network are communicating well?
By Pinging the IP address of é other.

39. An IP address is used 2 identify the network é device is part of identifies a unique device within a network

40. The uses of the ICMP includes
To trouble shoot network problems such as DNS resolution and connectivity.

41 The correct sequence for connecting a network bridge involve
- Open control panel
- clicking connect network bridge
- clicking bridge computers
- click network and internet connection and click network connections.

42. The main job of the gateway is to convert protocols among communication network.

43. The 1st step in identifying a broadcast é multicast storm is perform a latency test.

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2 computers to be connected without é need of a hub or switch.

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