

QUESTION



[3] According to the table below, provide an appropriate description for each property under the appropriate column. (1 mark)

0.95 |c|>X|>X|

Type of networkDSL Fibre Optic Cable

Directionality of MediumGuided Guided

Material of MediumTwisted Pair drawing glass (silica)

Transmission speed<2.5Mbps upstream <10s-100s Gbps transmission rate

Directionality of Medium(a) Guided

Material of MediumTwisted Pair (b)

Transmission speedUp to 45 Mbps per channel (c)

[03] Briefly *describe* two difference between **TDM** and **FDM**.

The queue or buffer in the router preceding a link has finite capacity.

Packets may arrive at a full queue.

Packets arriving at a full queue are dropped or lost (may be retransmitted).

Assume there is a copper network with 8 nodes (N0, N1, N2, N3, N4, N5, N6, N7, N8, N9) and the transmission rates b

It is also determined that the distances between the nodes are as follows: (Note that all working out must be shown, failure to

N0-N1: 20km

N1-N2: 24km

N1-N3: 4km

N1-N4: 8m

N3-N5: 6km

N5-N6: 28km

N5-N7: 32km

N6-N8: 30km

N7-N9: 12km

Answer the following questions (Do not round off): [1] *Determine* the **approximate transmission rate** when communicating

[02] Taking this **approximate transmission rate** into account, how *long* (in seconds) will it take to transfer a 75 Megab

600 / 2 = 300 seconds (1 mark) (no if they use their own throughput)

[03] If it is determined that the copper installed in this network **propagates** a signal at a speed of 200 000 km/s. *Calcul*

44 / / 200 000 = 0.00022 seconds (2 marks)

[04] Assuming that there is no nodal processing delay or queueing delay, *calculate* the **total time** taken to transfer a 75

Total = 388.93 + 0.00022 = 388.93022 seconds (2 marks) (1 mark if use their own values)

IP in binary: 01011000 01001101 01000010 10011011 (2marks)
Link N8 (1 mark)

[05] *Discuss* the Channel Partitioning MAC protocol and *briefly describe* two approaches in Channel Partitioning.
Channel Partitioning: divide channel into smaller "pieces" (time slots, frequency, code) and allocate a piece to node for exclusive access.
TDMA: time division multiple access
Access to channel in "rounds": each station gets fixed length slot (length = packet transmission time) in each round. Unused time in round is wasted.
FDMA: frequency division multiple access
Channel spectrum divided into frequency bands: each station assigned fixed frequency band. Unused transmission time in frequency band is wasted.
[05] *Discuss* the Ethernet frame structure and *draw* a diagram to support your answer. (1 mark each relevant fact - max 4)
-Sending adapter encapsulates IP datagram (or other network layer protocol packet) in Ethernet frame
-Preamble: 7 bytes with pattern 10101010 followed by one byte with pattern 10101011 used to synchronize receiver, sender clock
-Addresses: 6 bytes if adapter receives frame with matching destination address, or with broadcast address (e.g. ARP packet)
-Type: indicates higher layer protocol (mostly IP but others possible, e.g., Novell IPX, AppleTalk)
-CRC: checked at receiver, if error is detected, frame is dropped (1 mark for the diagram:) [width=9cm]img/10_25SSA

[04] *Explain* the function of the Android Manifest file in an Android project.
Located in root of application directory
All components of application must be declared here
Identifies user permissions required
Minimum API level (Android version)
Hardware and Software requirements
API Libraries to be linked

[01] *Which* network tool is used to find out what routers a packet passes through to reach its destination Traceroute

[10] Provide Java source code for a **UDP Client** that sends a message (entered by the user) to a UDP server that runs on

[10] The code below illustrates a **TCP server** that handles client requests including the return of a specified video file. Fill in the code to complete the server.
[language=java]code/fillinTCPHandler3.java
connectionToClient.getInputStream(); 1 mark
new StringTokenizer(message); ; 1 mark
msgTokens.nextToken(); 1 marks
fileToReturn.length() 1 mark
(n=fis.read(buffer))>0 2 marks
dos.write(buffer,0,n); 2 mark
processing = false; 1 mark
connectionToClient.close(); 1 mark
