

NAME:- KRUNAL RANK

Adm. No:- U18C00081

BTECH 3RD YEAR

Computer Networks

Tutorial 1

Ans 1: The five components of data communication are:-

- Sender
- Receiver
- Channel (Transmission medium)
- Message
- Protocol

Ans 2: Advantages of distributed ~~map~~ processing maps are:-

- Collection of autonomous computing elements:-

Modern distributed systems can and often will consist of all kinds of nodes ranging from very big high computers to small plug computers or even smaller devices. A fundamental principle is that nodes can act independently from each other.

- Single coherent system:-

A distributed CN system should appear as a single coherent system, meaning that end users should not even notice that processes, data and control are dispersed across a computer network. This approach is taken in many Unix-like operating systems in which resources are accessed through a unifying file-system interface, effectively hiding the differences between files, storage devices, main memory and networks.

- Middleware and distributed systems:-
To assist the development of distributed systems, they are organised to have layers of softwares placed above the operating systems of the computers.

Ans 3: For mesh topology, no. of wires = $n_2 = \frac{n(n-1)}{2}$

For star topology, no. of wires = n

For Ring topology, no. of wires = $n-1$

For bus topology, no. of wires = $n-1$

Ans 4: Throughput is the amount of data moved successfully from one place to another place.

Frames per minute = 14000

Bits per frame = ~~14000~~ 11000

So, Throughput = $\frac{14000 \times 11000}{60} = 2.3 \text{ Mbps}$

Ans 5: No. of pages = 100
No. of lines in each page = 24
No. of characters in each line = 80
No. of bits per character = 8

$$\text{Downloading rate} = 100 \times 24 \times 80 \times 8 \\ = \underline{\underline{1.536 \text{ Mbps}}}$$

Ans 6: No. of file size = 2 MB = ~~2~~ 16 Mb

$$\text{Time taken to download it using 56 Kbps network} \\ = \frac{16 \times 10^3}{56} = 285.714 \text{ s.} \\ = \underline{\underline{4.7 \text{ minutes}}}$$

Time taken to download it using 1 Mbps network

$$= \frac{16}{1} = \underline{\underline{16 \text{ s}}}$$

Ans 7: Required bits to show 1024 colours = 10
No. of pixels = 1200 x 1000

$$\text{Total bits transmitted} = 12 \times 10^6 \\ = \underline{\underline{12 \text{ Mb}}}$$

Ans 8:

Data rate = 1000 bps

$$\text{Time taken to send 10 bits} = \frac{10}{1000} = \underline{\underline{0.01 \text{ s}}}$$

$$\begin{aligned} \text{Time taken to send 1 character} \\ = \text{Time taken to send 8 bits} &= \frac{8}{1000} = \underline{\underline{0.008 \text{ s}}} \end{aligned}$$

Time taken to send 1000 characters

$$= \frac{8000}{1000} = \underline{\underline{8 \text{ s}}}$$

Ans 9:

35 MHz

$$T = \frac{1}{35 \times 10^6} = \underline{\underline{0.0285 \mu\text{s}}}$$

A

$$= \underline{\underline{0.0285 \times 10^{-3} \text{ ms}}}$$

$$= \underline{\underline{28.5 \text{ ns}}}$$

40 Hz

$$T = \frac{1}{40} = \underline{\underline{25 \text{ ms}}} = \underline{\underline{25 \times 10^3 \mu\text{s}}}$$

$$= \underline{\underline{25 \times 10^6 \text{ ns}}}$$

10 KHz

$$T = \frac{1}{10 \times 10^3} = \underline{\underline{0.1 \text{ ms}}} = \underline{\underline{100 \mu\text{s}}} = \underline{\underline{10^5 \text{ ns}}}$$