Mid Term Assiment

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Subject:

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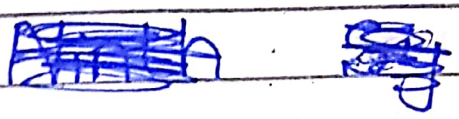


9th Semister

Q(a) The open System interconnect (OSI) model is a conceptual frame work that organizes the functionalities of any type of communication in layered structure. The Data is linked layer transforms bit streams, and handles the sequential transmission of these frames by regulating flows and handing error ..... introduced by the international standards organizations argue the above case study and give your reasoning?

A(a) The (OSI) model is a most important conceptual frame work that provides the function of telecomm-unition system or networking from the technology and infrastructure It further divides the data communtions into

seven abstrictions and protocls into groups of networking functiona-lity to ensure within the communication system. Regardless of the technology vendor model and type. The (OSI) model was orginally developed to facilitate interoperability between vendors to define clear standard for network communication. The older TCP/IP remanes the reference frame work, for internet communications now a days. The older TCP/IP architecture model that had already itself in a real world networking environments. It also serued as a solid foundation for the internet including all type of privacay

asecurity, and perfomence related to objective and challenges as continued research and investmints, Development and industry of (OSI) model could have made today's cyber world a different place but the prepatation of the TCP/IP model gave us internet that prevails today. But now a days the (OSI) model is hugely ~~pre~~ criticized for an inherent impleimentation complexity ~~city~~ that renders networking operations incomplete and very slow. But unfurtantly this aproach fail to gain attraction in the industry. Vendors had already invested lot's of resorces in

TCP/IP product's and had to manage interoperability with the huge choises of protocols and specification that is offered by the OSI model.

Q.1(b) Argue the advantages and disadvantages of combining the session, presentation, and application layer in OSI model onto single application layer in the internet model.

A) Now wer are going to discuss the advantages and disadvantages of combining the session, presentation and application layer is OSI model given below.

Advantages

1) In single layer we study

we study that all the functionalities provided at this layer. It is the top most layer which is very important.

2. Higher Bandwidth as number of layer is decreased.

3. Each layer adds a level of encapsulation, three layers means that the application data is encapsulated three times, instead of one with one layer.

4. It also seperate the application from the TCP - downward sections of the OSI model.

Disadvantages

1) It can make the architecture of network system less effictive.

2) There will be lot of security issues as the application security and network security will open at a single point which may expose our network to threat.

3) It can also make trouble shooting hard as multiple error at a single point.

4) So the over all perfomence of the system is slower, so you need more frames to transport the same amount of application data if you increase it effect and slower the over all

system.

(Q2) There are several (a) network layer models proposed in OSI model. Find all of them. Explain the difference between them.

A) International organzation for Standardization there are seven layer below.

1) Application (e.g SNMP, HTTP, FTP)

2) Data link (e.g MAC, switches)

3) Session (e.g Sayn/Ack)

4) Presentation (e.g encryption, ASCII, PNG, MIDI)

5) Physical (e.g cables, RJ45)

6) Transport (e.g TCP, UDP, port numbers)

7) Network (e.g IP, routers)

Network layers and functions:

For the OSI model, let's start at the top layer and work our way down.

Layer 7 (Application): Most of what the user actually interects with is at this layer. Web browsers and other internet-connected applications (like Skype or outlook) use layer 7 application protocols.

Layer 6 (Presentation):

This layer convert data to and from the application layer. In other words, it translates applications formeating to network formeating and vice versa. This allows the different layer to

understand each other.

Layer 5 (Session):

This layer establishes and terminates connections between device. It also determines which packets belong to which text and image files.

Layer 4 (Transport):

This layer coordinates data transfer between system and host's, including error-checking and data recovery.

Layer 3 (Network):

This layer determines how data is sent to the recieving device. It's responsible for packet forwarding, routing and addressing.

Layer 2 (Data link):

Translates binary (or BITs) into signals and allows upper layer's to access media.

Layer 1 (Physical):

Actual hardware sit at this layer. It transmits signal over media.
The TCP/IP model, sometimes referred to as a protocol stack, can be considered a condensed version of the OSI model.

- Layer 1 (Network Access):

Also called the link or Network interface layer. This layer combines the OSI model's L1 and L2.

- Layer 2 (Internet):

This layer is similar to the OSI

model's L3.

• Layer 3 (Transport):

Also called the Host-to-Host layer. This layer is similar to the OSI model's L4

• Layer 4 (Application):

Also called the process layer, this layer combines the OSI model's L5, L6 and L7.

Q2: If a signal does not
(b): change at all, it's frequency is zero. if a signal changes instantaneously, it's frequency is infinite. Three components of a sine wave are amplitude, frequency and phase of a signal. The change in a signal shows the reaction between signal amplitude w.r.t to time where as the phase is not shown.

Explain your answer why we cannot explicitly show phase in a time-phase plot?

A) Therefore the two waves at different frequency and wave length cannot be same copies of each other the difference is only by face shift so it is possible that the sum of two waves can be periodic then thiese will be in over all face for the new perodic signal. Frequency and ~~phase~~ Phase are not ~~ex~~ exactly measured on time domain. Therefore frequency domain plot shows the relation-ship between frequency and amplitude. Frequency have main role in this process. Phase and frequency can't be measure on time here.

3: Four connections (10kps, 100kps, (a): 1mbps and 10mbps) are multiplexed together. A unit 1 byte or 8 bits. (a) find the duration of 1 bit before multiplexing. (b) The transmission rate of the link. (c) The duration of a time slot and (d) the duration of a frame.

A) Formula:

$$\frac{\text{Unit bit}}{\text{Connection Speed}} = \text{Duration}$$

10 kbps = 10,000 bps

So,

$$\frac{1}{10,000} = 0.0001 \text{ bs} = 1 \text{ms}$$

- Now finding the duration of 1 bit for 1 mbps.

$= \frac{1 \text{ bit}}{1 \text{ mbps}} \Rightarrow 1 \text{ Mbps} = 10^6 \text{ bps}$

$= \frac{1}{10^6 \text{ bps}} = 10^{-6} \text{ seconds}$

$= 14 \text{ seconds}.$

• Duration of 1 bit for 10mbps:

$= \frac{1}{10 \times 10^6 \text{ bps}} = \frac{1}{1 \times 10^7 \text{ bps}}$

$= 1 \times 10^{-7} \text{ sec}$

$= 10 \times 1^{-7} = 10^{-7} 4 \text{ sec}.$

• Transmission rate of link:

The rate of link is 4x the rate of connections.

Rate of connection = 4

$4 \times 1 = 4 \text{ kbps}$

- Duration of time slot;

Duration of each time slot is in 1/4 of each bits.

i-e 1/4 ms or 2504. The, bit duration can be increase of data by 1/4 kbps or 2504.

- Duration of frames:

Duration of frames as same as duration of time and unit. means that the duration of both time and unit could be same here.

- Finding Duration of 1 bit for 100 kbps:

$$= \frac{1 \text{ bit}}{100 \text{ kbps}} \Rightarrow 100 \text{ kbps} = 100,000 \text{ bps}$$

$$= 0.00001 \text{ second}$$

Q3: We need a three (b): stage space division switch with total input of 10,000. we use 1000 crossbar's at the fist and third stages and 16 crossbar's at the middle stage.

a) Draw the configuration diagram.

SOLUTION (A):

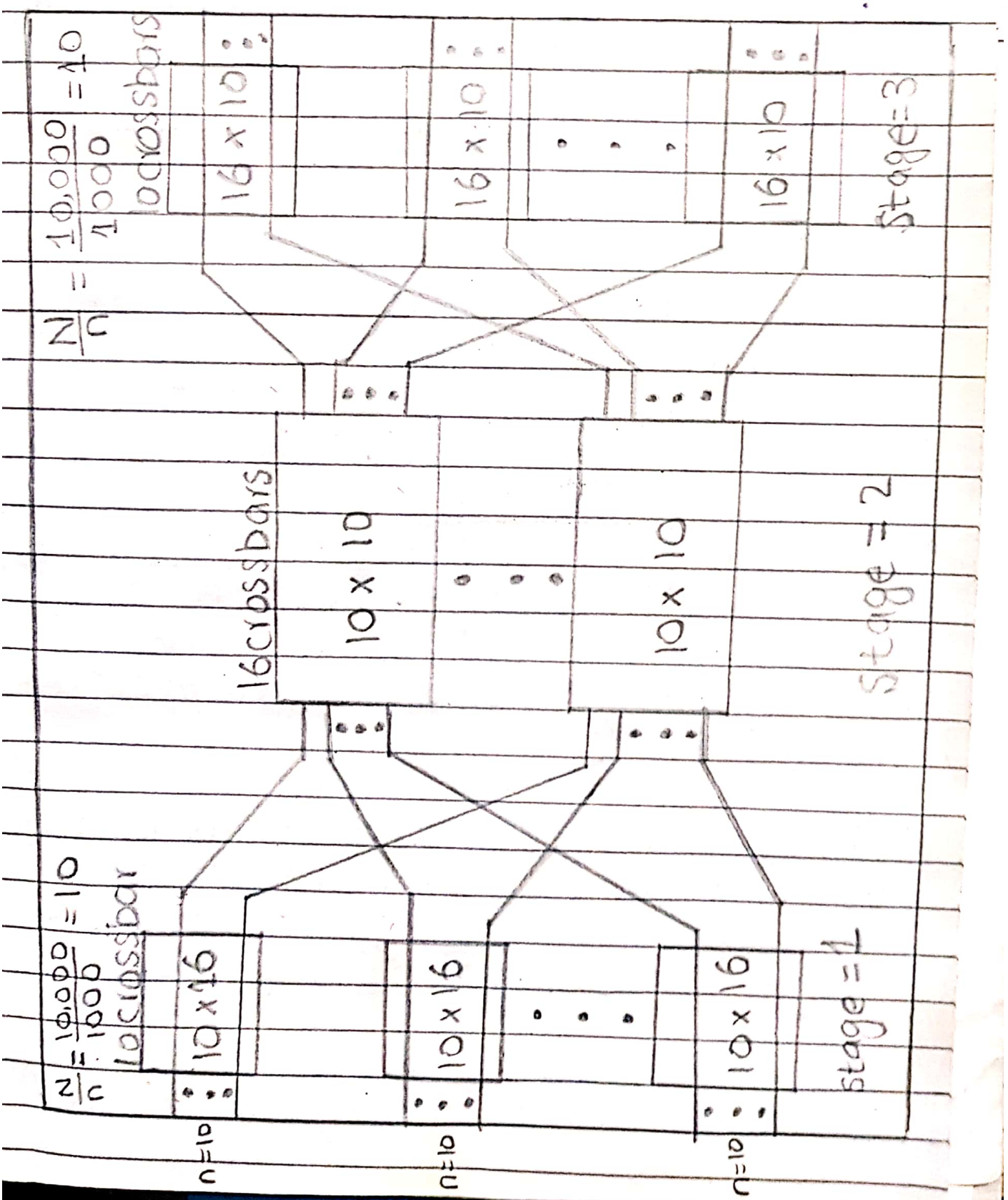
Given data:

N = 10,000
n = 1000
K = 16

In the first stage we have N/n = 10,000/1000 cross bar's, each of size 10 * 16.

Second stage: 16 crossbars each of size 10 * 10

In 1st stage we have 10 crossbar's each of size 16 * 10.



b) Calculate the total number of cross points.

Total no. of cross point's

$= 10(10 \times 16) + 16(10 \times 10) + 10(10 \times 10) =$

$= 4800.$

c) Find the possible number of simultanous connections.

Therefore, only 4 simoultanous connections are possible of each crossbar at the 1st stage. Which means that the total number of simultanous connection is $(16 \times 10) = 160.$

d) Find the possible number of simultanous connections if we use only one sigle crossbar (1000×1000)

Single crossbar (1000×1000) if we use single cross

bar all the input lines can have connection at same time. So that mean 1000 simultanous connection at same time.

e) Find the blocking factor and the ratio of a connection in C and d.

In C there are only 4 simultanous connection are possible for each crossbar. while in D we have single crossbar of (1000 x x 1800) which mean thousend simultanous connection.

END OF PAPER.....