Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2025-26

Class:	TE-AIDS	Semester:	V
Course Code:	CSC501	Course Name:	CN

Name of Student:	Divya Davane
Roll No. :	13
Assignment No.:	04
Title of Assignment:	Transport layer
Date of Submission:	
Date of Correction:	

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	05
Demonstrated Knowledge	3	03
Legibility	2	02
Total	10	10

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge Legibility	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty :

Signature :

Date :

CN Assignment - 4

Q.1 A livestock market application must send continuous updates to a client using TCP. Determine how the sliding window mechanism helps maintain a steady stream of updates without packet loss with a appropriate diagram.

Ans The sliding window protocol is used in TCP to allow multiple packets to be "in transit" before an acknowledgement (ACK) is received.

This prevent idle time on the sender side and ensures a steady flow of data.

- **Window size (W) :**
  The maximum number of unacknowledged packets that can be sent at once.

- **Sender window :**
  Moves forward as acknowledgement as received

- **Receiver window :**
  Tells how much data the receiver can accept.

* **How it helps it livestock Market updates :**

i) **Without sliding window (stop-and-wait):**
- Server sends one update → waits for ACK → then sends the next

- This causes delays, especially over longer networks

ii) **With sliding window :**
- Server can send multiple updates before receiving an ACK.

- Client acknowledges as updates arrives, freeing space in the window

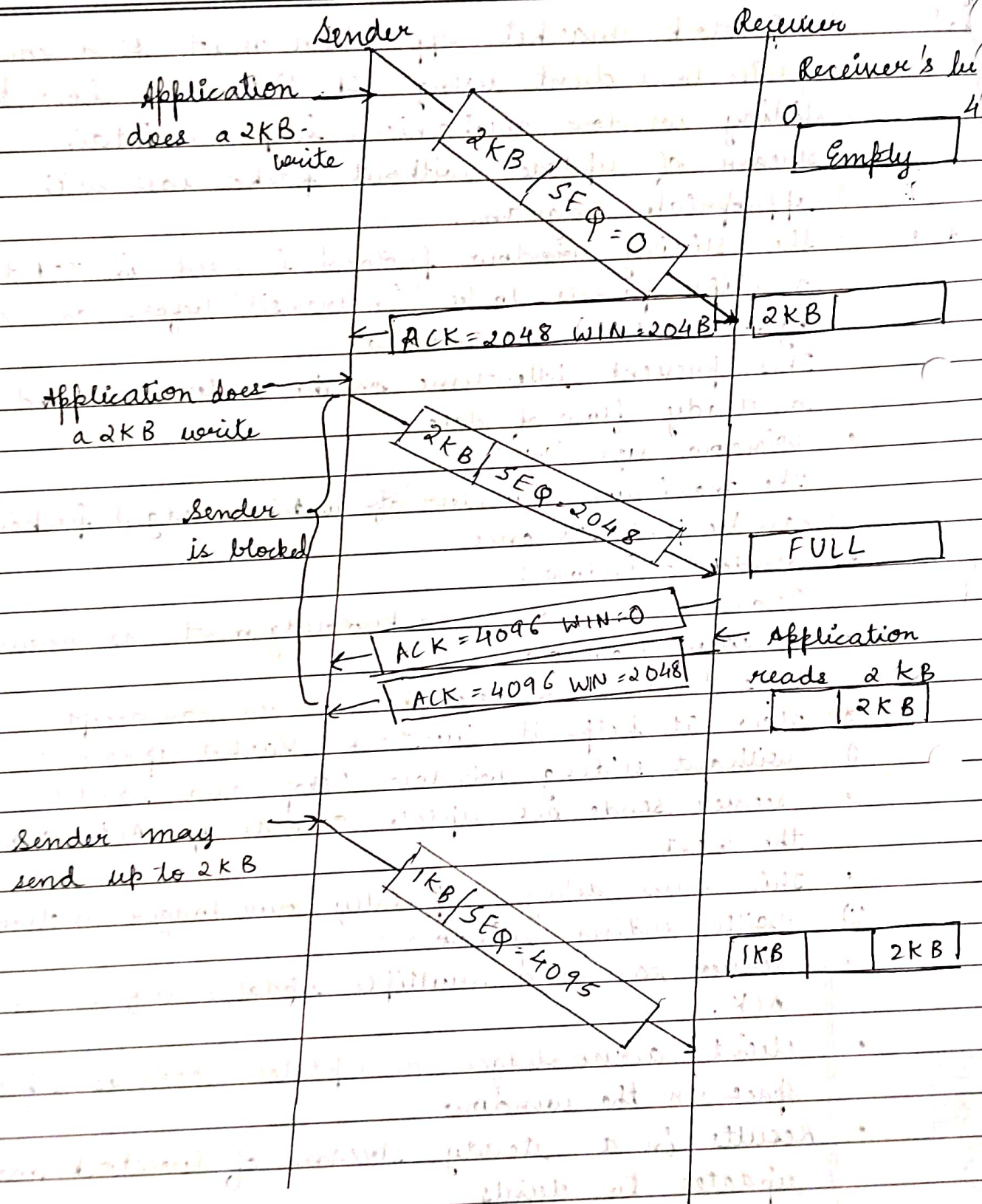- Results in a steady stream of livestock market updates to clients.

Sender   Receiver

Receiver's bu

Application ——→
does a 2KB
write

2KB / SEQ = 0

0   4
Empty

2KB

←| ACK=2048 WIN=204B →|

Application does ——→
a 2KB write

2KB / SEQ=2048

Sender
is blocked

FULL

←| ACK=4096 WIN=0   ←— Application
←| ACK=4096 WIN=2048   reads 2 KB

2KB

Sender may —→
send up to 2KB

1KB / SEQ=4095

1KB   2KB

Q.2 Below is a Hexadecimal dump of an UDP datagram captured.

E2 a7 00 0D 00 20 74 9e 0e ff 00 00 00 01 00 00 0000
00 00 06 69 73 61 74 61 70 00 00 01 00 01

i) Find the source port number
ii) Find the destination port number.
iii) Find the total length of the user datagram.
iv) Find the total length of data
v) Is packet directed from client to server or vice versa?

Ans Following is the UDP datagram structure
The UDP Header is of size 8 bytes & remaining are of data.

i) Source port number:
(E2A7)$_{16}$

ii) Destination port number:
(000D)$_{16}$

iii) Total length of user datagram:
(0020)$_{16}$ = (32)$_{10}$ bytes

iv) Total length of data:
Total length - header length
= 32 - 8
= 24 bytes

v) Packet directed from client to server.

|← 8 bytes →|
| Header | Data | UDP datagram |

← 16 bits →	← 16 bits →
Source port	Destination port
Length	Checksum

|← 32 bits →|

|← First 8 bytes →|
| E2A7 | 000D | 0020 | 749E | UDP header |

→ checksum

→ Length

→ Destination port number

→ Source port number