Practical 7

AIM:

Write a program to implement flow control at data link layer using

SLIDING WINDOW PROTOCOL. Simulate the flow of frames from one

node to another.

ALGORITHM:

1. Initialize Frames

- For each character in the input message, create a Frame object with:

    o frame_no (frame number).

    o data (character data).

    o acknowledged set to False.

2. Send Frames

- For each frame within the window size:

    o If the frame has not been acknowledged, print that it has been sent.

3. Receive Acknowledgments

- For each frame within the window size:

    o Simulate receiving an acknowledgment.

    o With 20% probability, mark the frame as having an error (not acknowledged).

    o Otherwise, mark the frame as acknowledged.

4. Slide the Window

- Move the window to the next unacknowledged frame.

- Repeat the sending and receiving steps for unacknowledged frames.

5. Resend if Necessary

- If there are any frames still unacknowledged, resend them.

6. End

- Once all frames are acknowledged, print that the message has been fully sent and acknowledged

OUTPUT:

```
Enter window size: 3
Enter a message to send: chanddraprakash

--- Sending Frames ---
Sent Frame 0: c
Sent Frame 1: h
Sent Frame 2: a
Frames sent, waiting for acknowledgments...

--- Receiving Frames ---
Received Frame 0: c [OK]
Received Frame 1: h [OK]
Received Frame 2: a [OK]

Resending unacknowledged frames...

--- Sending Frames ---
Sent Frame 3: n
Sent Frame 4: d
Sent Frame 5: d
Frames sent, waiting for acknowledgments...

--- Receiving Frames ---
Received Frame 3: n [OK]
Received Frame 4: d [OK]
Received Frame 5: d [OK]

Resending unacknowledged frames...

--- Sending Frames ---
Sent Frame 6: r
Sent Frame 7: a
Sent Frame 8: p
Frames sent, waiting for acknowledgments...
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```
--- Receiving Frames ---
Received Frame 6: r [ERROR]
Received Frame 7: a [OK]
Received Frame 8: p [ERROR]

Resending unacknowledged frames...


--- Sending Frames ---
Sent Frame 6: r
Sent Frame 8: p
Frames sent, waiting for acknowledgments...


--- Receiving Frames ---
Received Frame 6: r [OK]
Received Frame 8: p [OK]

Resending unacknowledged frames...


--- Sending Frames ---
Sent Frame 9: r
Sent Frame 10: a
Sent Frame 11: k
Frames sent, waiting for acknowledgments...


--- Receiving Frames ---
Received Frame 9: r [OK]
Received Frame 10: a [OK]
Received Frame 11: k [ERROR]

Resending unacknowledged frames...


--- Sending Frames ---
Sent Frame 11: k
```

```
Sent Frame 12: a
Sent Frame 13: s
Frames sent, waiting for acknowledgments...


--- Receiving Frames ---
Received Frame 11: k [OK]
Received Frame 12: a [OK]
Received Frame 13: s [OK]

Resending unacknowledged frames...


--- Sending Frames ---
Sent Frame 14: h
Frames sent, waiting for acknowledgments...


--- Receiving Frames ---
Received Frame 14: h [OK]

All frames sent and acknowledged!


...Program finished with exit code 0
Press ENTER to exit console.
```