

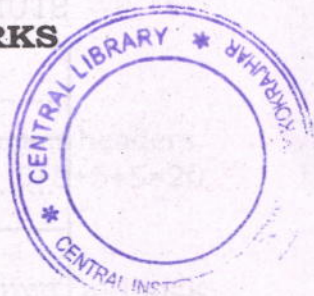
2019

COMPUTER NETWORKS

Paper : IT 403

Full Marks : 100

Time : Three hours



The figures in the margin indicate full marks for the questions.

Answer any five questions.

- (a) Mention the layers of the OSI Reference Model.

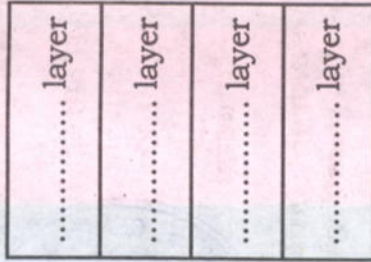
(b) Compare TCP/IP and OSI model.

(c) Assume a layered networking architecture. The packet structure in this architecture, as seen at the lowest (physical) layer, is as follows :

AICTE Header	CIT Header	IT Header	Student data
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Contd.

Sketch the layered protocol model that applies to the given architecture by labeling each layer in the figure below with the appropriate layer name. Your choices are AICTE, CIT, IT and STUDENT data.



5+5+10=20

2. (a) Explain with diagram, how the lost frame, delayed frame and lost acknowledgement are handled in Go-Back-N ARQ.
- (b) An IP packet with 2500 bytes of data (plus header) passes through an IP network with MTU = 500. How many additional bytes will be delivered at the destination?
10+10=20
3. (a) Write down the main function of network layer.

(b) Draw and briefly describe IPv4 header fields.

(c) Final netID, the host ID and network mask of the following IP addresses :

(i) 23.67.12.1

(ii) 190.12.67.9

(d) Compare IPv4 and IPv6 packet headers.
5+5+5+5=20

4. (a) An organization is granted a block 130.56.0.0/16. The administrator has created 1024 subnets.

(i) Find the number of addresses in each subnet.

(ii) Find the subnet prefix.

(iii) Find the first and the last address in the first subnet.

(iv) Find the first and last address in the last subnet.

(b) A Host S opens a TCP connection using an initial sequence number (ISN) of 14,535. Other party R opens the connection with an ISN of 21,732. Show the three TCP segments during the connection establishment. 20



5. (a) A router has the following RIP routine table :

NET1	4	B
NET2	2	C
NET3	1	F
NET4	5	G

What would be the contents of the table if the router receives the following RIP message from Router C?

NET1	2
NET2	1
NET3	3
NET4	7

(b) An organization is granted a block 130.56.0.0/16. The administrator has created 1024 subnets.

- (i) Find the number of addresses in each subnet.
- (ii) Find the subnet prefix.
- (iii) Find the first and the last address in the first subnet.
- (iv) Find the first and the last address in the last subnet.

6. (a) Describe the leaky bucket and token bucket algorithm in brief with necessary diagram.

(b) Why do we need a DNS system when we can directly use an IP address if a DNS domain is cit.ac.in? 20

7. Write short notes on the following : $5 \times 4 = 20$
(any four)

(a) Selective Repeat ARQ

(b) ARP

(c) DHCP

(d) Network Address Translation (NAT)

(e) E-mail and SMTP

(f) OSPF routing algorithm.

