Subhojit Ghimire
1912160

UG End Sem Exam

Semester - V^th

Date : 18/12/2021

Name : Subhojit Ghimire
Sch Id : 1912160
Branch : CSE-B

Subject : Computer Network

Subject Code : CS301

Q.1.a

(a)

Ans → OSI Model is seven layered architecture introduced by ISO while TCP/IP is either 4 layer or 5 layer architecture introduced by ARPANET as a more practical model. While both OSI and TCP/IP have their own pros and cons, TCP/IP model is the better one for following reasons:

i) OSI model is generic and standard, but TCP/IP model is practical and reliable and also provides more security.

ii) OSI model does not have any special mechanism for providing a reliable and secure connection for data transmission, but TCP/IP model uses 3-way handshake mechanism for providing reliable and secure connection link over the network.

iii) TCP/IP is an implemented model of an OSI model and hence, TCP/IP is highly used.

Subhojit Ghimire
1912160

Q.1.

(b)

Ans → Given, Bandwidth = 10 Mbps

12000 frames per minute. carrying 10000 bits.

To find throughput.

$$\text{Throughput} = \frac{12000 * 10000}{60} \text{ bits/s}$$

$$= 2000000 \text{ bits/s}$$

$$= 2 \text{ Mb/s}$$

∴ Throughput = 2 Mbps

Q.2.

(a)

Ans → Hamming code can be used to correct burst errors in following way:

i) To each group of m information bits k parity bits are added to form (m+k) bit code.

ii) Location of each of the (m+k) digits is assigned a decimal value.

iii) The k parity bits are placed in positions 1, 2, ..., 2^{k-1} positions. K parity checks are performed on selected digits of each codeword.

iv) At the receiving end the parity bits are recalculated. The decimal value of the k parity bits provides the bit-position in error, if any.

Q.20

(b).

Ans → The components of Email system are:

i) User Agent: It is a program that is used to send and receive mail.

ii) Message Transfer Agent: It is responsible for transferring the mails from one system to another.

iii) Mailbox: It is a local Storage collecting mails that have been delivered.

iv) Spool file: It is a collection of mails that are to be sent.

Q.20

(a)

Ans → Continue...

Example:

7	6	5	4	3	2	1
d_4	d_3	d_2	r_4	d_1	r_2	r_1

$r_1 \rightarrow 1, 3, 5, 7$

$r_2 \rightarrow 2, 3, 6, 7$

$r_4 \rightarrow 4, 5, 6, 7$

Sent data → 1010010

Received data → 1110010

Error position → 6

Therefore, Corrected data →

C_3	C_2	C_1
1	1	0

Q.40

Ans → (i) Slow Start : A and H

(ii) Congestion Avoidance : B to G

(iii) Additive Increment : B and E

(iv) Multiplicative decrement : C and F

(v) Timeout : G

(vi) 3-DUP Acks : Vertex of B and C

Q.30

Ans →

(i) Yes, the packet has option.

$$HLEN = (B)_{16} = (11)_{10}$$

The length is found by multiplying four times.

So, Length of header = 11×4 = 44 bytes.

And, Length of option = 44 - 20 = 24 bytes.

(ii) Source IP : $(17F5\ 1028)_{16}$ = 23.245.192.45

Destination IP : $(B8D5\ 45F7)_{16}$ = 184.223.69.247

(iii) MTU = 513 bytes

Flag = 010 (in format RDM)

i.e., D = 1

Therefore, packets not fragmented.

Q.5.

Solution → Given, CIDR Block Address: 191.169.0.0/16

So, first and second octet combined form 8+8 = 16 bits.

The network Id is : 191.169.0.0

The network prefix n = 16

Number of hosts = 2^{16}

Number of usuable hosts = $2^{16} - 2$

(from 191.169.0.0 to 191.169.255.255)

191.169.0.0 is network Id

191.169.255.255 is direct broadcast address.

So,

for Group 1: 64 customers

Each need 128 addresses.

So,

IP Addresses for Group 1: 191.169.0.0/19

to 191.169.31.255/19

for Group 2: 128 customers.

Each need 64 addresses.

So,

IP Addresses for Group 2:

191.169.32.0/19 to 191.169.63.255/19

Therefore, the IP address was divided as such,

191.169.0.0/16

191.169.0.0/19 to 191.169.31.255/19 — Group 1

191.169.32.0/19 to 191.169.63.255/19 — Group 2

Customer wise addressing:

for group 1,

Customer 1: 191.169.0.0/25 to 191.169.0.127/25

Customer 2: 191.169.0.128/25 to 191.169.0.255/25

⋮

Customer 64: 191.169.31.128/25 to 191.169.31.255/25

for group 2,

Customer 1: 191.169.32.0/26 to 191.169.32.63/26

Customer 2: 191.169.32.64/26 to 191.169.32.127/26

Customer 3: 191.169.32.128/26 to 191.169.32.191/26

Customer 4: 191.169.32.192/26 to 191.169.32.255/26

⋮

Customer 128: 191.169.63.192/26 to 191.169.63.255/25

Total allocated addresses = 16384

Total unallocated addresses = 49152