Name: Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Term Semester Examination, July 2020

Program: B. Tech. CSE + CCVT **Semester:** IV
Course: Data Communication and Computer Networks **Time 02 hrs. (2 PM-4 PM)**
Course Code: CSEG2009 **Total Question: 60**
Max. Marks: 100

Total Course Objectives: 05

From each CO

8 Questions X 2 marks = 16 marks

4 Questions X 1 mark = 4 Marks

CO1

2 marks Questions

Ques 1: Which of the following statement is false

a) Frequency and period are the inverse of each other.
b) Change over a long span of time means higher frequency.
c) Phase describes the position of the waveform relative to time 0.
d) A complete sine wave in the time domain can be represented by one single spike in the frequency domain.

Ans : b

Ques 2: What is the bit rate for high-definition TV (HDTV)? HDTV uses digital signals to broadcast high quality video signals. The HDTV screen is normally a ratio of 16 : 9. There are 1920 by 1080 pixels per screen, and the screen is renewed 60 times per second. Twenty-four bits represents one color pixel.

a) 3 Gbps
b) 3 Mbps
c) 1.5 Gbps
d) 1.5 Mbps

Ans : b

Ques 3: What are the propagation time and the transmission time for a 6-Mbyte message (an image) if the bandwidth of the network is 1 Mbps? Assume that the distance between the sender and the receiver is 24,000 km and that light travels at 2.4×10^8 m/s

a) 100 ms and 48 s

b) 48 ms and 100 s
c) 100 s and 48 ms
d) 48 s and 100 ms

Ans : a

Ques 4: In which of the switching techniques there is no overhead bits after call is setup

a) Circuit Switching
b) Message switching
c) Packet Switching
d) None of these

Ans: a

Ques 5: In which of unguided media for the transmission ,the sending and receiving antennas need to be proper aligned with each other

a) Radiowave
b) Microwave
c) Ultraviolet
d) Sinewave

Ans: b

Ques 6: The loss in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with −0.3 dB/km has a power of 4 mW, what is the power of the signal at 5 km?

a) 1.4 mW
b) 2.8 mW
c) 1 mW
d) 2 mW

Ans: b

Ques 7: Data rate is independent of…….

a) The bandwidth available
b) The level of the signals we use
c) The quality of the channel (the level of noise)
d) None of the above

Ans : d

Ques 8: We have a channel with a 1-MHz bandwidth. The SNR for this channel is 63. What are the appropriate bit rate and signal level?

a) 6Mbps and 4
b) 4 Mbps and 6
c) 6Mbps and 6
d) None

Ans: a

1 mark Questions

Ques 1: No. of edges in RING topology if no. of nodes N

a) N
b) N-1
c) 2N
d) N(N-1)/2

Ans : a

Ques 2: No. of edges in MESH topology if no. of nodes N

a) N
b) N-1
c) 2N
d) N(N-1)/2

Ans : d

Ques 3: Correct increasing order with respect to scale

a) Multicast-unicast-broadcast
b) WAN-MAN-LAN
c) Unicast-multicast-broadcast
d) WAN-LAN-MAN

Ans : c

Ques 4: If a signal changes instantaneously, its frequency is

a) 0
b) 1
c) infinite
d) none of these

Ans : c

CO 2

2 marks Questions

Ques 1: Local telephone network is an example of a _____ network.

a) Packet switched

b) Circuit switched

c) Bit switched

d) Line switched

Ans: b

Ques 2: In _____ systems, resources are allocated on demand.

a) Packet switching

b) Circuit switching

c) Line switching

d) Frequency switching

Ans: a

Ques 3: ---------- switching assumes that the data rate in both directions is the same

a) Circuit
b) Packet
c) Message
d) b and c

Ans: a

Ques 4: ---------- switching is well suited for voice communication while ---------- switching is better suited for data and other non-voice communication.

a) Message; circuit

b) Circuit; message

c) Packet; circuit

d) Circuit; packet

Ans: d

Ques 5: Which address is used on the internet for employing the TCP/IP protocols?

a) Physical address and logical address

b) Port address

c) Specific address

d) All of the mentioned

Ans: d

Ques 6: Transmission data rate is decided by _____

a) Network layer

b) Physical layer

c) Data link layer

d) Transport layer

Ans: b

Ques 7: According to OSI model, which layer is responsible for routing?

a) Data Link Layer
b) Network Layer
c) Session Layer
d) Presentation Layer

Ans: b

Ques 8: Which of the following layers of OSI Model does Ethernet Operate?

a) Both Physical and Network Layers
b) Data Link Layer
c) Physical Layer
d) Both Physical and Data Link Layer

Ans: d

1 mark Questions

Ques 9: A topology that involves Tokens.

a) Star

b) Ring

c) Bus

d) Daisy Chaining

Ans: b

Ques 10: What is FRAD in frame relay network?

a) FRAD assembles and disassembles the frames coming from other protocols

b) FRAD is used for modulation and demodulation

c) FRAD is used for error detection

d) FRAD is used for error recovery

Ans: a

Ques 11: ATM uses _____

a) Asynchronous frequency division multiplexing

b) Asynchronous time division multiplexing

c) Asynchronous space division multiplexing

d) Asynchronous amplitude division multiplexing

Ans: b

Ques 12: In gigabit Ethernet three or more stations are connected by

a) Ring
b) Bus
c) Mesh
d) Star

Ans: d

CO 3

2 mark Questions

Ques 1: An error correcting code has the following code words:

00000000, 00001111, 01010101, 10101010, 11110000.

What is the maximum number of bit errors that can be corrected?

(A) 0

(B) 1

(C) 2

(D) 3

Answer: (B)

Ques 2: Host A is sending data to host B over a full duplex link. A and B are using the sliding window protocol for flow control. The sender and receiver window sizes are 5 packets each. Data packets (sent only from A to B) are all 1000 bytes long and the transmission time for such a packet is 50 microseconds. Acknowledgement packets (sent only from B to A) are very small

and require negligible transmission time. The propagation delay over the link is 200 microseconds. What is the maximum achievable throughput in this communication?

a)7.69×10^6bps b) 11.11×10^6bps c)13.33×10^6bps d)15.00×10^6bps

Ans: b

Ques 3: Station A needs to send a message consisting of 9 packets to Station B using a sliding window (window size 3) and go-back-n error control strategy. All packets are ready and immediately available for transmission. If every 5th packet that A transmits gets lost (but no acks from B ever get lost), then what is the number of packets that A will transmit for sending the message to B?

(A) 12

(B) 14

(C) 16

(D) 18

Answer (C)

Ques 4: Consider the following message M = 1010001101. The cyclic redundancy check (CRC) for this message using the divisor polynomial x5 + x4 + x2 + 1 is :

(A) 01110

(B) 01011

(C) 10101

(D) 10110

Ans: A

Ques 5: A simple parity-check code can detect _____ errors.

A) an odd-number of

B) an even-number of

C) two

D) no errors

Ans: a

Ques 6: Consider a CSMA/CD network that transmits data at a rate of 100 Mbps (108 bits per second) over a 1 km (kilometre) cable with no repeaters. If the minimum frame size required for this network is 1250 bytes, what is the signal speed (km/sec) in the cable?

(A) 8000

(B) 10000

(C) 16000

(D) 20000

Ans: d

Ques 7: A pure ALOHA network transmits 200-bit frames on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces1000 frames per second .

a) 140

b) 135

c) 1000

d) none of the above

Ans: b

Ques 8: A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is 25.6 μs, what is the minimum size of the frame?

a) 512 bits

b) 64 bits

c) 128 bits

d) none of the above

Ans: a

1 mark Questions

Ques 9: In synchronous TDM, for n signal sources of the same data rate, each frame contains _____ slots.

A) n + 1

B) n – 1

C) 0 to n

D) n

Ans: d

Ques 10: The sharing of a medium and its link by two or more devices is called _____.

A) modulation

B) multiplexing

C) encoding

D) line discipline

Ans: b

Ques 11: What type of acknowledgement system is used in 802.5?

a) Cumulative ACK
b) Independent ACK
c) Piggybacking ACK
d) None

Ans: c

Ques 12: In ---------- , each station is forced to send only at the beginning of the time slot.

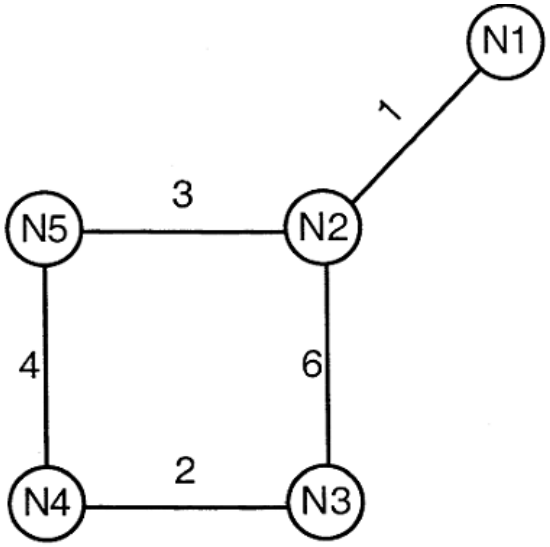
A. Pure ALOHA
B. Slotted ALOHA
C. Both Pure and Slotted ALOHA
D. None of the above

Ans:b

CO 4

2 marks Questions

Ques 1: Consider a network with five nodes, N1 to N5, as shown below.



The network uses a Distance Vector Routing protocol. Once the routes have stabilized, the distance vectors at different nodes are as following.

N1: (0, 1, 7, 8, 4)
N2: (1, 0, 6, 7, 3)
N3: (7, 6, 0, 2, 6)
N4: (8, 7, 2, 0, 4)
N5: (4, 3, 6, 4, 0)

Each distance vector is the distance of the best known path at the instance to nodes, N1 to N5, where the distance to itself is 0. Also, all links are symmetric and the cost is identical in both directions. In each round, all nodes exchange their distance vectors with their respective neighbors. Then all nodes update their distance vectors. In between two rounds, any change in cost of a link will cause the two incident nodes to change only that entry in their distance vectors. 52. The cost of link N2-N3 reduces to 2(in both directions). After the next round of updates, what will be the new distance vector at node, N3.

A) (3, 2, 0, 2, 5)
B) (3, 2, 0, 2, 6)
C) (7, 2, 0, 2, 5)
D) (7, 2, 0, 2, 6)

Ans:a

Ques 2: Consider the following three statements about link state and distance vector routing protocols, for a large network with 500 network nodes and 4000 links.

[S1] The computational overhead in link state protocols is higher than in distance vector protocols.

[S2] A distance vector protocol (with split horizon) avoids persistent routing loops, but not a link state protocol.

[S3] After a topology change, a link state protocol will converge faster than a distance vector protocol.

Which one of the following is correct about S1, S2, and S3?
(A) S1, S2, and S3 are all true.

(B) S1, S2, and S3 are all false.
(C) S1 and S2 are true, but S3 is false.
(D) S1 and S3 are true, but S2 is false.

Ans: d

Ques 3: Two popular routing algorithms are Distance Vector(DV) and Link State (LS) routing. Which of the following are true?

(S1) Count to infinity is a problem only with DV and not LS routing

(S2) In LS, the shortest path algorithm is run only at one node

(S3) In DV, the shortest path algorithm is run only at one node

(S4) DV requires lesser number of network messages than LS

(A) S1, S2 and S4 only

(B) S1, S3 and S4 only

(C) S2 and S3 only

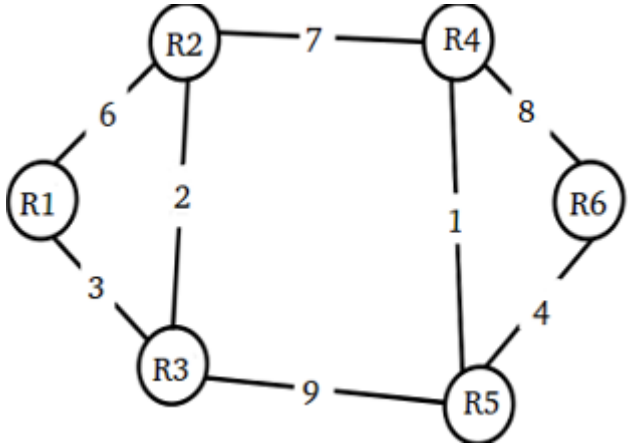
(D) S1 and S4 only

And: d

Ques 4: Which one of the following is TRUE about interior Gateway routing protocols – Routing Information Protocol (RIP) and Open Shortest Path First (OSPF)
(A) RIP uses distance vector routing and OSPF uses link state routing
(B) OSPF uses distance vector routing and RIP uses link state routing
(C) Both RIP and OSPF use link state routing
(D) Both RIP and OSPF use distance vector routing

Ans: a

Ques 5: Consider a network with 6 routers R1 to R6 connected with links having weights as shown in the following diagram:



All the routers use the distance vector based routing algorithm to update their routing tables. Each router starts with its routing table initialized to contain an entry for each neighbour with the weight of the respective connecting link. After all the routing tables stabilize, how many links in the network will never be used for carrying any data?

(A) 4

(B) 3

(C) 2

(D) 1

Answer: (C)

Ques 6: Count to infinity is a problem associated with

(A) Link state routing protocol.

(B) Distance vector routing protocol

(C) DNS while resolving host name.

(D) TCP for congestion control.

Ans : b

Ques 7: An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. Which of the following is a valid allocation of addresses to A and B?

A) 245.248.136.0/21 and 245.248.128.0/22
B) 245.248.128.0/21 and 245.248.128.0/22
C) 245.248.132.0/22 and 245.248.132.0/21
D) 245.248.136.0/24 and 245.248.132.0/21

Ans: A

Ques 8: Match the following:

(P) SMTP (1) Application layer

(Q) BGP (2) Transport layer

(R) TCP (3) Data link layer

(S) PPP (4) Network layer

(5) Physical layer

(A) P – 2 Q – 1 R – 3 S – 5

(B) P – 1 Q – 4 R – 2 S – 3

(C) P – 1 Q – 4 R – 2 S – 5

(D) P – 2 Q – 4 R – 1 S – 3

Ans: B

1 mark Questions

Ques 9: Which of these is not a type of error-reporting message?

a) Destination unreachable

b) Source quench

c) Router error

d) Time exceeded

Ans: c

Ques 10: The DHCP server can provide the _____ of the IP addresses.

a) Dynamic allocation

b) Automatic allocation

c) Static allocation

d) All of the mentioned

Ans: d

Ques 11: In class B if subnet mask is 255.192.0.0 Total Number of networks than can be joined:

(A) 32
(B) 64
(C) 16
(D) None of the Above

Ans: b

Ques 12: During error reporting, ICMP always reports error messages to _____

a) Destination

b) Source

c) Next router

d) Previous router

Ans: b

CO 5

Ques 1: Role of IP Pseudo header in UDP header-----

a) For checksum calculation
b) For CRC calculation
c) For error correction
d) None of these

Ans: a

Ques 2: Which of these are not a control field in TCP header

a) URG
b) ACK
c) FIN
d) PST

Ans: d

Ques 3: Size of header of TCP segment in bytes

a) 40 fixed
b) 20-60 range
c) 20-40 range
d) 20 fixed

Ans : b

Ques 4: Identify the incorrect statement regarding TCP connection

a) A SYN segment cannot carry data, so it does not consumes sequence number
b) A SYN + ACK segment cannot carry data, but does consume one sequence number.
c) The FIN segment consumes one sequence number if it does not carry data.
d) The FIN + ACK segment consumes one sequence number if it does not carry data.

Ans: a

Ques 5: TCP sliding windows are ----- oriented.

a) bit
b) byte
c) word
d) none

Ans: b

Ques 6: Maximum burst size is

a) Maximum length of time peak generated
b) Maximum length of time average generated
c) No. of times peak generated
d) Total time when peak generated

Ans: a

Ques 7: In ---------- there is no communication between congested node or nodes and the source .The source guesses there is congestion somewhere in the network

a) Backpressure
b) Choke packet
c) Implicit signalling
d) Explicit signalling

Ans: c

Ques 8: Four common methods to improve Qos are: scheduling, traffic shaping, admission control, and resource reservation. In this scheduling does not includes

a) Weighted fair queuing
b) Priority queuing
c) FIFO queuing
d) Weighted queuing

Ans: d

1 mark Questions

Ques 1: Transport Layer deals with------

a) Mac address
b) IP address
c) Port Number
d) Physical address

Ans : c

Ques 2: UDP is better than TCP in-----

a) Speed of delivery
b) Guaranteed message delivery
c) Error detection
d) TCP is always better

Ans : a

Ques 3: In the internet Domain Name service is divided in 3 sections. Which among the below is not that section

a) Generic domain
b) Country domain
c) Reverse domain
d) Inverse domain

Ans : d

Ques 4: Which of the following does not belongs to mailing services

a) SMTP
b) IMAP
c) MIME
d) NVT

Ans : d