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B.E. 6th Semester Examination, 2006

Computer Network

Paper code: IT-601

Time: 3 hours

Branch: IT

Full Marks: 100

Answer Question I and any FOUR from the rest

- I. There are 30 multiple-choice questions, each with ONE correct answer. Write just correct answer number (A, B, C or D) in your answer script. $2 \times 30 = 60$
- A group of N stations share 56-kbps pure ALOHA channel. Each station outputs a 1000-bit frame on an average of once every 100 sec. What is the maximum value of N ?
 - 56
 - 28
 - 1000
 - 2800
 - What is the baud rate of the standard 10-Mbps Ethernet?
 - 10,000 samples/sec
 - 80,000 samples/sec
 - 160,000 samples/sec
 - 20,000 samples/sec
 - Consider building a CSMA/CD network running at 1 Gbps over a 1-km cable with no repeater. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size?
 - 46 bytes
 - 64 bytes
 - 80 bytes
 - None of the above
 - An IP packet to be transmitted by Ethernet is 60 bytes long, including all its headers. If LLC (Logical Link Control) is not in use, is padding needed in the Ethernet frame, and if so, how many bytes?
 - 4
 - 6
 - 8
 - None of the above
 - The networks might use an error correcting code instead of error detection and retransmission, where
 - more reliable transmission is required
 - bit error rate is high
 - propagation delay is very long compared to transmission time
 - both B and C
 - Sixteen-bit messages are transmitted using a hamming code. How many check bits are needed to ensure that the receiver can detect and correct single bit errors?
 - 5

- (B) 16
 - (C) 21
 - (D) can not be determined
7. A bit string 1101011011 is transmitted using CRC. The generator polynomial is x^4+x+1 . The checksum field of the bit sting is
- (A) 1110
 - (B) 1010
 - (C) 10011
 - (D) 11100
8. A network on the Internet has a subnet mask of 255.255.240.0. What is the maximum number of hosts it can handle?
- (A) 4094
 - (B) 4096
 - (C) 256
 - (D) 16
9. The IP address 241.35.12.78 is assigned to
- (A) none
 - (B) www.google.com server
 - (C) www.yahoo.co.in server
 - (D) www.becs.ac.in server
10. The *protocol* field of Ipv4 header is meant for
- (A) transport protocol
 - (B) network protocol
 - (C) application protocol
 - (D) DLL protocol
11. Which of the following performs best in very high load
- (A) ALOHA
 - (B) 0.5 persistent CSMA/CD
 - (C) 0.001 persistent CSMA/CD
 - (D) 1 persistent CSMA
12. Which one of the following is false
- (A) Internet is a heterogeneous computer network
 - (B) A computer network may connect homogeneous computers
 - (C) Error detection and correction is the only task of data link layer
 - (D) Error correction is an important task of transport layer
13. Computer A has an IP address of 192.168.1.5. Computer B can access the file server, Computer A cannot. Which of the following statements best identifies the problem?
- (A) The subnet mask of the file server is set incorrectly
 - (B) The network portion of the IP address of computer A is set incorrectly
 - (C) The subnet mask on computer A is set incorrectly
 - (D) The network portion of the IP address of file server is set incorrectly
14. The maximum length of IP datagram in bytes is
- (A) 20
 - (B) 60

- (C) 65535
(D) none of the above
15. What is the length of the three-byte token for a 4 Mbps token ring LAN? The speed of propagation is 2×10^8 m/s.
(A) 800 m
(B) 1000 m
(C) 1200 m
(D) none of the above
16. In a token ring LAN, operating at a speed of 16 Mbps, a station has 3 frames each of 8 KB. The token holding time is 10 ms. How many of these frames can the station send after it has captured a token?
(A) 1
(B) 2
(C) 3
(D) cannot be determined
17. A and B are the only two stations on an Ethernet. Each has a steady queue of frames to send. Both A and B attempt to transmit a frame, collide and A wins the first back-off race. At the end of this successful transmission by A, both A and B attempt to transmit and collide. The probability that A wins the second back-off race is
(A) 0.5
(B) 0.625
(C) 0.75
(D) 1.0
18. Number of transitions is higher in Manchester encoding scheme than differential Manchester encoding scheme in the bit-stream
(A) any sequence of 0 and 1
(B) 111...1
(C) 000...0
(D) cannot be determined
19. Two computers C1 and C2 are configured as follows. C1 has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0. Which one of the following statements is true?
(A) C1 and C2 both assume they are on the same network
(B) C2 assumes C1 is on the same network, but C1 assumes C2 is on different network
(C) C1 assumes C2 is on the same network, but C2 assumes C1 is on different network
(D) C1 and C2 both assume they are on different network
20. Which of the following is false?
(A) Both switch and router selectively forward data packets
(B) A switch deals with IP address while router deals with MAC address
(C) A switch builds up its routing table by inspecting incoming packets
(D) A router can connect a LAN with a WAN
21. A collection of five routers is to be connected in a point-to-point subnet. Between each pair of routers, the designers may put a high-speed line, a medium speed

line, a low-speed line, or no line. If it takes 100 ms of computer time to generate and inspect each line, how long will it take to inspect all of them?

- (A) 20 ms
- (B) 40 ms
- (C) 10 ms
- (D) cannot be determined

22. Which of the following is false?

- (A) UDP is connectionless protocol
- (B) TCP is connection oriented protocol, and so a dedicated physical link between source and destination is mandatory
- (C) TCP may fragment user data
- (D) *telnet* utilizes TCP

23. Choose the best matching between Group 1 and Group 2.

<u>Group 1</u>	<u>Group2</u>
P. Data link layer	1. Ensures reliable transport of data over a physical point-to-point link
Q. Network layer	2. Encodes/decodes data for physical transmission
R. Transport layer	3. Allows end-to-end communication between two processes
	4. Routes data from one network to the next

- (A) P-2, Q-4, R-1
- (B) P-1, Q-4, R-3
- (C) P-2, Q-3, R-1
- (D) P-1, Q-3, R-2

24. Choose the best matching between Group 1 and Group 2.

<u>Group 1</u>	<u>Group2</u>
P. ARPANET	1. Initially connect 5 IITs and IISc
Q. ERNET	2. Predecessor of today's Internet
R. ALOHA	3. Requires broadcast channel
S. Token bus	4. Bus topology

- (A) P-2, Q-4, R-1, S-3
- (B) P-2, Q-1, R-3, S-4
- (C) P-2, Q-3, R-1, S-4
- (D) P-2, Q-1, R-4, S-3

25. Which of the following is false?

- (A) Packet switching uses store-n-forward method
- (B) A dedicated path is established in virtual circuit switching method
- (C) Packets may follow same path in datagram switching method
- (D) Packets arrive in order in virtual circuit switching method

26. In a 5-node network, which is using distance vector routing, the number of columns in the routing table of a node is

- (A) 3
- (B) 5

