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Question Paper Code: 94202

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Computer science and Engineering

19UCS402- COMPUTER COMMUNICATION AND NETWORKS

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. A television broadcast is an example of transmission. CO1- U
(a) half-duplex (b) simplex (c) full-duplex (d) automatic
2. Checksums use _____ arithmetic. CO1- U
(a) one's complement arithmetic (b) two's complement arithmetic
(c) either (a) or (b) (d) none of the above
3. The network layer is concerned with _____ of data. CO1- U
(a) bits (b) frames (c) packets (d) bytes
4. Transport layer aggregates data from different applications into a CO1- U
single stream before passing it to _____
(a) network address (b) host address
(c) both (a) and (b) (d) none of the mentioned
5. Which is not a application layer protocol? CO1-U
(a) HTTP (b) SMTP (c) FTP (d) TCP

PART – B (5 x 3= 15Marks)

6. Define five components of data communication system. CO1- U
7. Bit stuff the following data CO2- App
00011111110011111010001111111111111000011111
8. In a block of addresses, we know the IP address of one host is CO2- App
182.44.82.16/26. What are the first address and the last address in this block?

9. What is meant by quality of service? What are the two categories of QoS attributes? CO1- U
10. Draw a working principle of SMTP in Application Layer CO1- U

PART – C (5 x 16= 80Marks)

11. (a) (i) Four channels, two with a bit rate of 200 kbps and two with a bit rate of 150 kbps, are to be multiplexed using multiple-slot TDM with no synchronization bits. Answer the following questions: CO2-App (8)
- What is the size of a frame in bits?
 - What is the frame rate?
 - What is the duration of a frame?
 - What is the data rate?
- (ii) Find the propagation time and the transmission time for a 5-Mbyte message (an image) if the bandwidth of the network is 1 Mbps? Assume that the distance between the sender and the receiver is 12,000 km and that light travels at 2.4×10^8 m/s. CO2-App (8)
- Or
- (b) (i) Consider a point to point link 2 km in length at what bandwidth would propagation delay at speed of 2×10^8 m/sec equal transmit delay for 100 byte packet? What about 512 byte packet? CO2-App (8)
- (ii) Assume that a voice channel occupies a bandwidth of 5kHz. We need to combine four voice channels into a link with a bandwidth of 10kHz to 30kHz. Show the configuration using the frequency domain. Assume there are no guard bands. CO2-App (8)
12. (a) Suppose we want to transmit the message 11001001 and protect it from errors using the CRC Polynomial X^3+1 . Use polynomial long division to determine the message that should be transmitted. Corrupt the left-most third bit of the transmitted message and show that the error is detected by the receiver using CRC Technique. CO2-App (16)
- Or
- (b) Using 5-bit sequence numbers, what is the maximum size of the sender and receiver windows for each of the following protocols? CO2-App (16)
- How?
- stop and wait ARQ
 - Go-back-N ARQ
 - Selective Repeat ARQ

13. (a) Explain Packet Switching in detail. CO1-U (16)
Or
(b) Explain about IPV4? Compare IPV4 and IPv6 CO1-U (16)
14. (a) Explain the congestion control categories in Transport layer protocols. CO1- U (16)
Or
(b) Explain the characteristics and functionality of transmission control protocol CO1- U (16)
15. (a) Explain different protocols in Application Layer CO1- U (16)
Or
(b) Explain the architecture of WWW CO1- U (16)

