CS-39

Indian Institute of Information Technology Ranchi

Department of Electronics & Communication Engineering

B. Tech End Semester Examination – Spring Semester 2022-23

Semester: 6

Course Instructor: Dr. Kirti Kumari

Course Code: CS-3006

Course Name: Computer Networks

Duration: 3 hrs. **QUESTION PAPER** ***Max Marks: 100***

Instructions:
(1). Number in [ ] indicates marks.
(2). Any missing data can be assumed suitably.
(3). For Q1 to Q10, select most appropriate option among the given options and are having 2 marks each.
(4). Symbols are having their usual meaning. Sec-A is compulsory and from Sec-B attempt any two questions completely.

Section-A (All Qs are compulsory)

1. In Circuit switching, the path
   A. Upto destination is allocated before the transmission
   B. Upto next intermediate node is allocated before the transmission of message begins
   C. To be followed depends on the length of the message
   D. None
2. Which protocol is bit oriented?
   A. TCP
   B. UDP
   C. HDLC
   D. SWP
3. Which name is used as protocol data unit of Data Link layer and Network layer respectively?
   A. Datagram and Frame
   B. Frame and Datagram
   C. Segment and Frame
   D. Datagram and Segment
4. Which protocol is used for acceleration of data download?
   A. SMTP
   B. TCP
   C. HDLC
   D. DAP
5. What it is the maximum number of hops is allowed in RIP protocol?
   A. 32
   B. 48
   C. 15
   D. 16
6. If SYN=0 and Ack=1 indicate?
   A. Data packet
   B .Control Packet
   C. Acknowledgement packet
   D. Open connection packet
7. The port number of SMTP and HTTP are respectively----?
   A. 20 and 21
   B. 80 and 25
   C. 25 and 80
   D. 53 and 25
8. What addressing system has topological significance?
   A. Physical Addressing System
   B. Network or Logical Addressing System
   C. Port Addressing System
   D. Multicast Addressing System
9. A receiver using stop-and-wait ARQ sends NAK frames numbered ----------.
   A. 0 and 1 only
   B. Sequentially, beginning with 0
   C. Sequentially, beginning with 1
   D. The frames are not numbered

8 9 10
A B A

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10. Default route have a subnet mask of ----------in routing table?
    A. 255.255.255.255
    B. 255.0.0.0
    C. 0.0.0.0
    D. 0.255.255.255

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11 (a) What is DNS? What are the different types of services provided by DNS? Briefly describe each of them with examples. **[08]**

(b) What are the different types of Transmission media? Briefly describe each of them with examples. Distinguish the Twisted-pair cable, Coaxial cable and Fiber-optic cable. **[10]**

12 (a) What are the 6 different types of special IPv4 addresses are? Briefly describe each of them with example. **[08]**

(b) Briefly describe each the field of IP protocol. **[09]**

13 (a) Briefly describe each of the field of TCP header. **[10]**

(b) Distinguish ARP and RARP protocols. **[05]**

Section-B (Any 2 Qs completely)

14 (a) Consider an IP packet with a length of 1500 bytes that includes a 20 bytes IPv4 header and a 40 bytes TCP header. The packet is forwarded to an IPv4 router that supports a Maximum Transmission Unit (MTU) of 525 bytes. Assume that the length of the IP header in all the outgoing fragments of this packet is 20 bytes. Calculate the More Fragment and Offset value of each and every fragment. **[05]**

(b) Consider a class C network with Subnet Mask of 255.255.255.192. Identify the number of bits borrowed from Host ID and their position. Also calculate the possible number of subnets and their ID's, possible number of systems for subnet and range of IP addresses in each and every subnet. **[10]**

15 (a) Consider the following table at an IP router. For each IP addresses given below identify the correct choice of the next hop using entries from the routing table below. **[08]**

a. 128.96.171.92
b. 128.96.167.151
c. 12896.163.121
d. 128.96.165.121

Network Number	Subnet Mask	**Next Hop**
128.96.170.0	255.255.254.0	Interface A
128.96.168.0	255.255.254.0	Interface B
128.96.166.0	255.255.254.0	R2
128.96.164.0	255.255.252.0	R3
0.0.0.0	Default	R4

(b) An IP router with a Maximum Transmission Unit (MTU) of 1500 bytes has received an IP packet of size 4405 bytes with an IP header size of 20 bytes. What values of the more fragment, datagram length and offset of the third fragment generated by the router? **[07]**

16 (a) The message 11001001 is to be transmitted using the CRC polynomial x^3+1 to protect it from errors. What message that should be transmitted? **[08]**

(b) Describe the working principle of SMTP protocol. **[7]**

----Best of Luck ----