Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: M.Sc.I
Sub_Code: FBEF611

6th Semester Regular Examination: 2024-25
SUBJECT: Computer Network
BRANCH(S): M.Sc.I(MC)
Time: 3 Hours
Max Marks : 70
Q.Code : S013

Answer Question No.1 (Part-I) which is compulsory, any five from rest (Part-II)
The figures in the right hand margin indicate marks.

Part-I

Q1 **Answer the following questions:** **(2 x 10)**

a) Explain the sequence of operations used in PCM technique.
b) If the bandwidth of a channel is 8 Kbps, how long does it take to send a frame of 200000 bits out of this device?
c) How do routers differentiate between unicast, multicast, and broadcast IUP packets?
d) Why is IPV4 to IPV6 transition required?
e) What are the services provided by Application layer protocol?
f) What is topology? Describe various types of topologies in computer network with example.
g) If the data unit to be transmitted is 10101001 00111001, how checksum error detection procedure at Sender site and Receiver site.
h) Distinguish between a low-pass channel and a band-pass channel.
i) What are the different types of addresses are available in computer network? Name the layer in which they are used?
j) What is domain name? Explain with example.

Part-II

Long Answer Type Questions (Answer Any five)

Q2 **a)** A 7 bit Hamming code is received as 1011011. Assume even parity and state whether the received code is correct or wrong, if wrong locate the bit in error? **(5 + 5)**

b) Write short notes on –
I) HTTP vs FTP, II) TCP vs UDP.

Q3 **a)** A 2 km long broadcast LAN has 107 bps bandwidth and uses CSMA / CD. The signal travels along the wire at 2 x 108 m/sec. What is the minimum packet size that can be used on this network? **(5 + 5)**

b) Obtain the 4-bit CRC code for the data bit sequence 10011011100 using the polynomial $X^4 + X^2 + 1$.

Q4	**a)**	A given IP Address is 201.20.30.40. Calculate network Id, 5th host Id, Last host Id and Broadcast Address from this IP Address.	**(5 + 5)**
	b)	Consider a bus LAN with a number of equally spaced stations with a data rate of 9 Mbps and a bus length of 1 km. What is the mean time to send a frame of 500 bits to another station, measured from the beginning of transmission to the end of reception? Assume a propagation speed of 150 m/s. If two stations begin to monitor and transmit at the same time, how long does it need to wait before an interference is noticed?	
Q5	**a)**	(i) Explain IPv4 Header format. (ii) Define UDP. Discuss the operation of UDP.	**(5 + 5)**
	b)	(i) Discuss the functions performed by of DNS with an example. (ii) Explain the working of DHCP protocol with its header format.	
Q6	**a)**	(i) How congestion control techniques are used to improve the QOS of the Computer Network? (ii) How TCP manages a byte stream?	**(5 + 5)**
	b)	Explain any two error detection and correction mechanisms with illustrative examples.	
Q7	**a)**	Describe how SMTP transfers message from one host to another with suitable illustration.	**(5 + 5)**
	b)	Considering in network scenario, What are the functions of ARP and RARP Protocols with frame formats?	
Q8	**a)**	In a digital transmission the sender clock is 0.3% faster than the receiver clock. How many extra bits/second does the sender send if the data rate is 2 Mbps?	**(5 + 5)**
	b)	A system is designed to sample analog signals convert them to digital form with a 4-bit convertor, and transmit them. What bit rate is required if the analog signal consists of frequencies between 400 Hz to 3400 Hz?	