JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATION- 2024
B.Tech-VI Semester (CSE/IT/ECE/CE)

COURSE CODE(CREDITS): 18B11CI611 (03)   MAX. MARKS: 25
COURSE NAME: **Computer Networks**
COURSE INSTRUCTORS: Dr. (Amit, Pankaj, Nishant), Mr Aayush   MAX. TIME: 02:00 Hrs

Note: (a)All questions are compulsory.
(b)Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make Suitable numeric assumptions wherever required for
solving problems

Q1. CO 4, 6	i.	In an IPv4 datagram, the M bit is 0, the value of HLEN is 5, the value of total length is 200, and the offset value is 200. What is the number of the first byte and number of the last byte in this datagram? Is this the last fragment, the first fragment, or a middle fragment?	3
	ii.	In electronic mail, what is MIME? Why do we need POP3 or IMAP4 for electronic mail?	3
Q2. CO 5, 4	i.	If a TCP connection has a congestion window (CW) of 16 KB and a maximum segment size (MSS) of 1 KB, how will congestion window be affected in case of: a) A single segment loss detected by a timeout. b) A single segment loss detected by three duplicate ACKs. c) Successful transmission of a complete window of segments without any loss.	5
	ii.	Describe the Dynamic Host Configuration Protocol (DHCP) using illustrative diagram in detail including following points: a) The primary purpose and functionality of DHCP. b) Key steps involved in DHCP implementation and role of DHCP server and c) Challenges of DHCP and possible solutions to address these challenges.	5
Q3. CO 5	i.	The following is a dump of a TCP header in hexadecimal format (7 Marks) 05320021 00000001 00000000 500207FF 00000000 a. What is the source port number? b. What is the destination port number? c. What is sequence number? d. What is the acknowledgement number? e. What is the length of the header? f. What is the type of the segment? g. What is the window size?	7
	ii.	Distinguish the TCP and UDP header with their formats. Mention fields in the TCP header that are missing in UDP header. Give the reason for their absence.	5
Q4. CO 6	i.	What are the security implications of key length in symmetric-key algorithms? Also specify the concept of Asymmetric Key Cryptography.	5
	ii.	In symmetric-key and asymmetric-key cryptography, if every person in a group of 10 people needs to communicate, with every other person in the group, how many secret keys are needed?	2