VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:	22BAI1266

Continuous Assessment Test (CAT) – II - April 2024

Programme	:	B.Tech (Computer Science and Engineering)	Semester	:	Winter 2023-2024
Course Code & Course Title	:	BCSE308L Computer networks	Class Numbers	:	CH2023240501647 CH2023240501655 CH2023240503360
Faculty(s)	:	Dr Neelanarayanan Dr Punitha K Dr Shree Prakash	Slot	:	E1+TE1
Duration	:	One and Half Hours (90 Minutes)	Max. Mark	:	50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

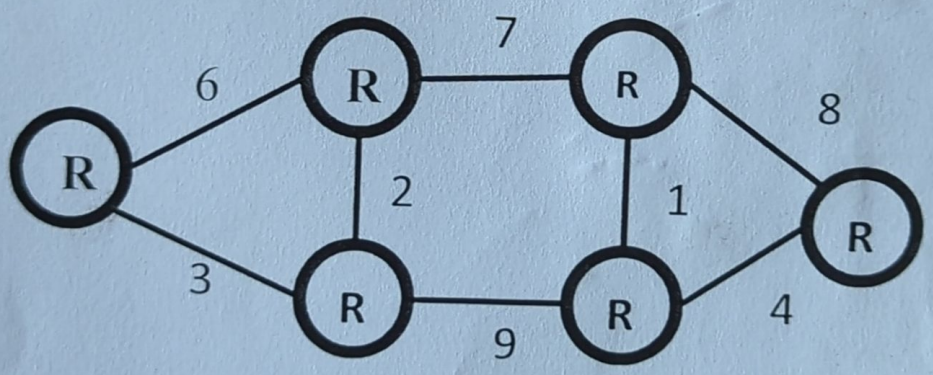
Answer all questions

<table>
<tr><th>Q. No</th><th>Sub Sec.</th><th>Description</th><th>Marks</th></tr>
<tr><td>1</td><td>a.</td><td>The received 7-bit codeword is '1101101' and assuming even parity, perform a comprehensive analysis of the received code to determine its correctness. If the code is found to be incorrect, rectify the error by using an appropriate method. [6 Marks]</td><td>10</td></tr>
<tr><td></td><td>b.</td><td>Assume that 12 bit hamming codeword consist of 8 bit data and 4 check bits as follows: $d_8\ d_7\ d_6\ d_5\ c_4\ d_4\ d_3\ d_2\ c_3\ d_1\ c_2\ c_1$, where the data bits and the check bits are given in the following tables:
<table>
<tr><th colspan="8">Data bits</th></tr>
<tr><td>d_8</td><td>d_7</td><td>d_6</td><td>d_5</td><td>d_4</td><td>d_3</td><td>d_2</td><td>d_1</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>x</td><td>0</td><td>1</td><td>0</td><td>1</td></tr>
</table>
<table>
<tr><th colspan="4">Check bits</th></tr>
<tr><td>c_8</td><td>c_4</td><td>c_2</td><td>c_1</td></tr>
<tr><td>y</td><td>0</td><td>1</td><td>0</td></tr>
</table>
Provide the values for x and y. [4 Marks]</td><td></td></tr>
<tr><td>2</td><td></td><td>Assume that two computers are communicating using the stop-and-wait ARQ protocol. Assume that the RTT for the communication channel is 2ms, and that the timeout is twice the RTT. Also assume that both parties use sequence numbers on data and ACK frames. If the sender has to send 8 frames to the receiver, draw the sequence of steps involved (include timing)
i. If the first 3 frames are sent and acknowledged without any loss
ii. The 4th frame is lost during the first and second transmission, but is acknowledged during the third transmission.
iii. The 5th frame is lost during the first transmission but acknowledged during the second transmission. The 6th frame is send and received without any loss during transmission
iv. During the transmission of 7th frame the acknowledgement is lost for the first time and acknowledgement received successfully during the second transmission. The 8th frame sent and received without any issue.
v. How much time it took for the above 8 frame to be transferred and acknowledged successfully?</td><td>10</td></tr>
</table>

3	a.	Host Ramesh, with the IP address 192.168.1.97, is connected to host Kamlesh, which has the IP address 192.168.1.80, through two routers, R1 and R2 respectively. R1 has the IP addresses 192.168.1.135 and 192.168.1.110, while R2 has the IP addresses 192.168.1.67 and 192.168.1.155. The network employs a netmask of 255.255.255.224. Based on the provided information, how many unique subnets are certain to be present in the network?	
	b	Ramesh wants to configure its gateway using IP addresses, 192.168.1.67, 192.168.1.135, and 192.168.1.110. Is it possible to configure the gateway using this IP addresses? Justify your answer in detail.	
4.		Consider a networking company offering four available subnets labelled as A, B, C, and D, with the following available subnets: 192.168.4.0/24, 140.168.0.0/16, 150.16.0.0/24, and 10.1.0.0/16 respectively. Subnet A requires total 30 hosts per subnet, subnet B requires 400 hosts, subnet C has a total of 50 subnets, and subnet D requires 2000 hosts per subnet. Fill the table given below with proper justification.	1(

	A	B	C	D
HOSTS				
new subnet mask				
number of subnets				
Subnet ranges:				

5.		Consider in a network there are six routers and their conections are shown below. After initializing their routing tables using the Routing Information Protocol, all routers in the network exchange routing information until stability is achieved. Following stabilization, certain links within the network will never be utilized for data transmission. Consequently, the weights of all these unused links are adjusted to 2, and the Routing Information Protocol is re-executed until routing tables stabilize once more. Determine which and how many links will subsequently remain unused. Also determine the links which are not used before adjustment of links to 2. Examine and draw all the routing tables properly.	10



**********All the best **********