Answer Key

Name of Examination	**Final Assessment Test** (FAT), Fall **Semester**		
Slot: D1+TD1	Course Mode: **CBL**	**Class Number (s):** VL2023240100822	

Course Code:	BCSE3008L	Course Title:	Computer Networks	
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Q. No.	Sub-division	Question Text
1.	A	A defence organization is planning to have the network built for their newly constructed office. There are 3 scientists working on confidential projects. Each scientist has a team of 5 engineers. Sketch a suitable topology with justification. Justification – 2 marks Diagram – 4 marks
	B	A company is hiring freshers to work on the Application layer and Transport layer. Identify any 4 protocols with their purpose , which the candidate has to be familiar to be eligible for the job TCP,UDP-Meant for establishing connection between processes (2) FTP,SMTP-File transfer protocol meant for transfer of files, Simple mail transfer protocol- for emails (2)
2.	A	5 equal sized datagrams belonging to the same message travel to the destination one after another. However they travel through different paths as shown in the following table. The delay for each switch (including waiting and processing) is 5,10, 15,10 and 20 ms respectively. Assume that the propagation speed is $2*10^8$ m/s. Compute the order in which the datagrams arrive at the destination and the delay for each. Ignore any other delays in transmission

Datagram	Path length	Visited switches
1	3200km	1,3,5
2	11,700km	1,2,5
3	12,200km	1,2,3,5
4	10,200km	1,4,5
5	10,700km	1,4,3,5

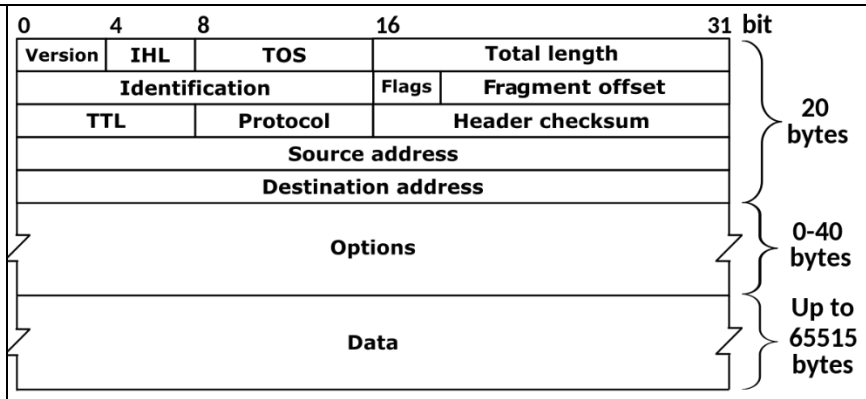
Solution: First delay- $(3200/2*10^8 m/s)+5+15+20=56$ (6*1=6 marks)

Second delay-$(11,700/2*10^8 m/s)+5+10+20=93.5$

Third delay $=(12,200/2*10^8 m/s)+5+10+15+20=111$

Fourth$=(10,200/2*10^8 m/s)+5+10+20=86$

	B	Fifth =(10,700/2*10^8m/s)+5+10+15+20=103.5 Order of arrival-1-4-2-3-5 Discuss the various phases in Circuit switching (4) 3 phases: – connection setup or circuit establishment, – data transfer, and – connection teardown or circuit disconnect.
3.		A software developer was given a task to write a code to send 8 frames (assuming every 3rd frame is getting lost). He has the option to choose either of the three algorithms , Stop & Wait , Go back 3 or Selective Repeat. Justify your answer with the time diagram 3*2=6 marks Stop and wait with diagram Go back n with diagram Selective repeat with diagram Justification =4 marks
4.	A	In a wireless communication system , a sensor node is transmitting temperature data of 7 bits to a base station. To ensure reliable transmission, Hamming code with even parity is applied to each temperature data. The data received on the receiving end is 01010111101. Identify any error and mention the steps to correct it. (6) P1=1 P2=1 P4=1 P8=0 Bit 7 is in error. It can be flipped
	B	A girl is travelling in a bus while she faces an uncomfortable situation. She immediately alerts her parents using the safety device attached in her mobile phone. Identify the type of connectivity/standards employed in the device with its features Bluetooth(4) Features
5.		The data captured from Wireshark tool is given below . Show the IPv4 header format with values given . (8) 0X4500004da548000080110000c0a82b7fc0a82b01



Version is ipv4 IHL 5 TOS 00, TOTLen004d

A548 Identification 0000 (flags and offset)

8011 chksum 0000

Source address c0.a8.2b.7f-> 192.168.43.127

Destination address c0.a8.2b.01-> 192.168.43.1

Analyse if the data is fragmented or corrupted with justification

Finding D bit (1)

D bit is 0, so it is fragmented

Finding chksum(1)

Chksum is 0, so no errors

6. A network uses the 172.12.0.0 class B address. There is a requirement to support 459 hosts per subnet, while accommodating the maximum number of subnets.

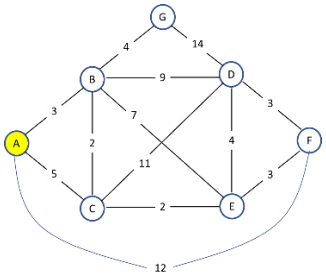
To obtain 459 hosts the number of host bits will be 9. This can support a maximum of 510 hosts. To keep 9 bits for hosts means the last bit in the 3rd octet will be 0.

This gives 255.255.254.0 as the subnet mask. (2)

The ip layout of first 3 usable IP address block and last IP address block is shown. (8 marks)

		Valid subnet/ network address	172.12.0.0	172.12.2.0	172.12.4.0	172.12.254.0
		Host address block	172.12.0.1 to 172.12.1.254	172.12.2.1 to 172.12.3.254	172.12.4.1 to 172.12.5.254	172.12.254.1 172.12.255.254
		Directed broadcast address	172.12.1.255	172.12.3.255	172.12.5.255	172.12.255.255

7. Evaluate the shortest path of all the links to A using Dijikstras algorithm



Table

A	B	C	D	E	F	G
A	3	5	∞	∞	12	∞
AB		5	12	10	12	7
ABC			12	7	12	7
ABCE			12		10	7
ABCEG			12		10	
ABCEGF			12			

8. Client A sends a request to abd.org to get the IP address of SRM.edu . Analyse both the Resolution techniques to locate the IP address alongwith the diagrams

Iterative resolution technique (5)

Recursive resolution technique (5)

9. Diffferentiate closed loop and open loop congestion control by quoting 2 mechanisms from each method

Closed loop (5)

Open loop (5)

10 With the rise of IoT devices getting connected on internet, the possibilities of data being attacked also increases. Recommend suitable IoT cloud security measures

		Any 5 measures -5*2=10

Signature with date