Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2025-26

Class:	TE-AIDS	**Semester:**	V
Course Code:	CSC501	**Course Name:**	CN

Name of Student:	Divya Davane
Roll No. :	13
Assignment No.:	3
Title of Assignment:	Apply Subnetting, Network Address Translation
Date of Submission:	25/8/25
Date of Correction:	

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	04
Demonstrated Knowledge	3	03
Legibility	2	02
Total	10	09

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge Legibility	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty :

Signature :

Date : 29/9

CN Assignment -3

DATE:

Q.1 An ISP is granted a block of addresses starting with 190.100.0/16 (65,536 addresses)
The ISP needs to distribute three addresses to three groups of customers as follows:

i) The first group has 64 customers; each needs 256 addresses

ii) The second group has 128 customers; each needs 128 addresses.

iii) The third group has 128 customers; each needs 64 addresses. Design the subblocks and find out how many addresses are still available after three allocation

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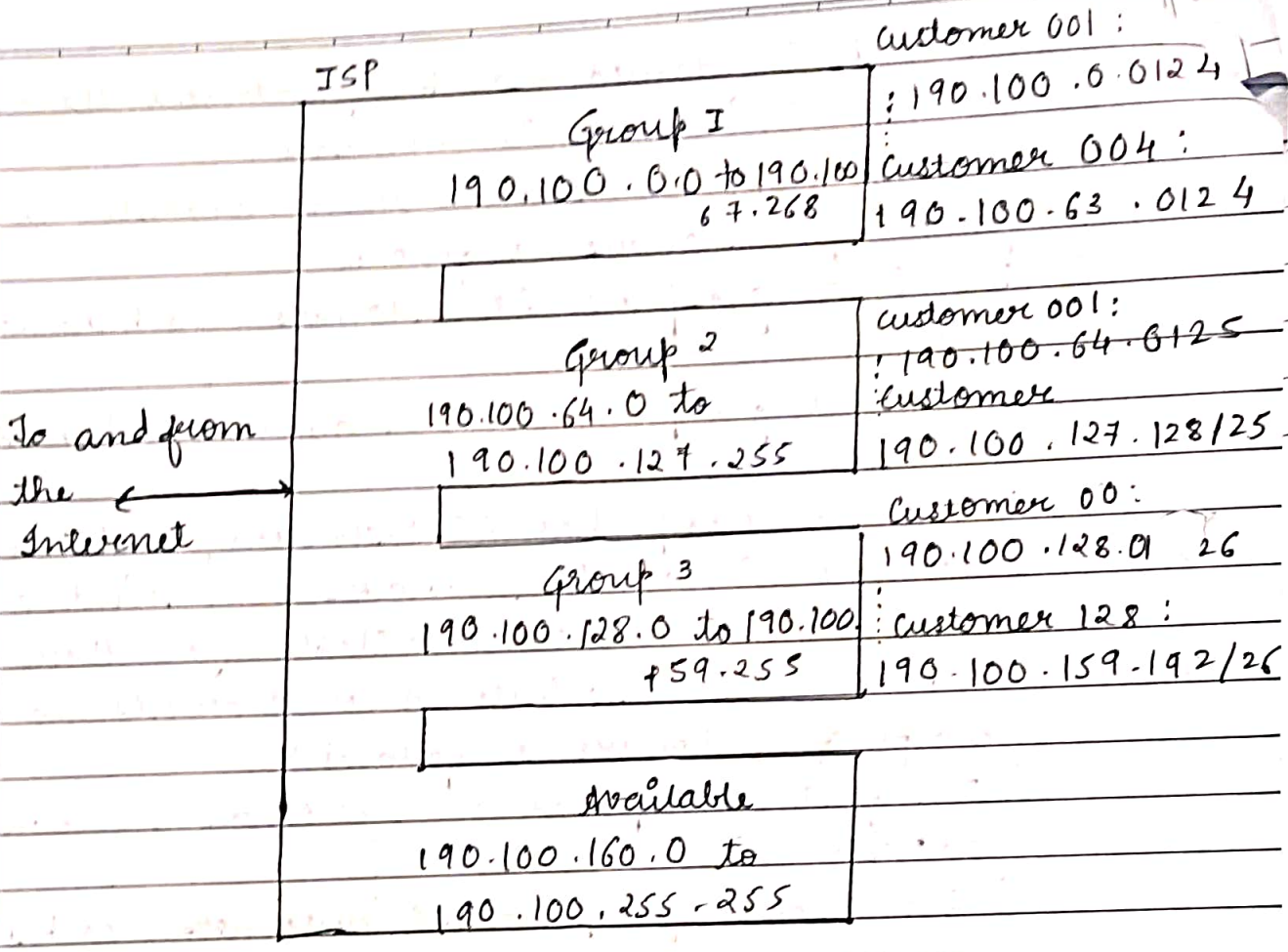
iii) The third group has 128 customers, each needs 64 addresses

DATE:



i) Group I:
The first group has 64 customers, each needs 256 addresses. In this group, each customer requires 256 addresses This means that $8(\log_2 256)$ bits are needed to define each host. The prefix length is then $32-8=24$. The addresses are:

1st Customer : 190.100.0.0/24 190.100.0.255/24
2nd customer : 190.100.1.0/24 190.100.1.255/24
⋮
64th Customer 190.100.63.0/24 190.100.63.255/24

Total = $64 \times 256 = 16384$

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ii) Group 2:

The second group has 128 customers, each needs 128 addresses. In this group, each customer needs 128 addresses. This means that 7 ($\log_2 128$) bits are needed to define each host. The prefix length is then 32-7=25. The addresses are:

1st Customer: 190.100.64.0/25 190.100.64.127/25

2nd Customer: 190.100.64.128/25. 190.100.64.255/25

:

128th Customer: 190.100.127.128/25 190.100.127.255/25

Total = 128 × 128 = 16384.

iii) Group 3:

The third group has 128 customers; each needs 64 addresses. In this group, each customer needs 64 addresses. This mean that 6 ($\log_2 64$) bits are needed to each host. The prefix length is then 32-6=26. The addresses are:

1st Customer: 190.100.128.0/26 190.100.128.63/126

2nd Customer: 190.100.128.64/26 190.100.128.127/126

:

128th Customer: 190.1001.159.192/26 190.100.159.255/26

Total = 128 × 64 = 8192

No of granted addresses to the ISP = 65,536

No of allocated addresses by the ISP = 40,960

No of available addresses: 24576.

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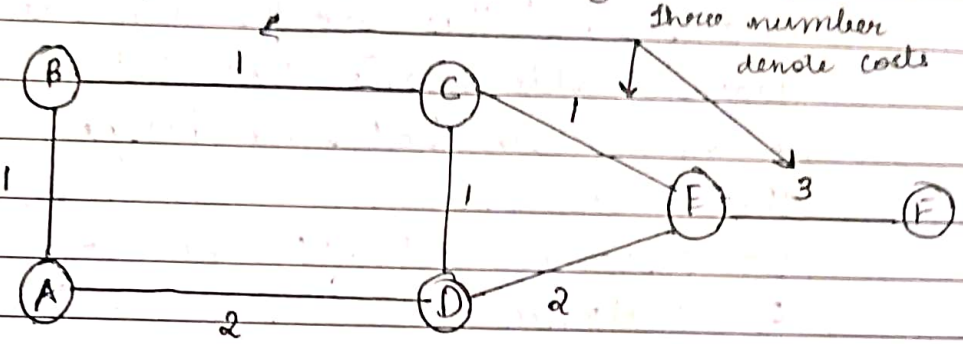
Q.2 For the network shown in fig, show the computations at node A using the Dykstra's Algorithm



Step	Node Chosen	A	B	C	D	E	F
Initial	-	0	∞	∞	∞	∞	∞
1	A	0	1	∞	2	∞	∞
2	B	0	1	2	2	∞	∞
3	C	0	1	2	2	3	∞
4	D	0	1	2	2	3	∞
5	E	0	1	2	2	3	6
6	F	0	1	2	2	3	6