Shri Ramdeobaba College of Engineering and Management, Nagpur.

Electronics and Communication Department

Session :2023-24(Even)

Programme: B.Tech. Third Year, VI Semester (Section: A & B)

Teacher's Assessment Plan

Course: Computer Networks **Course Code: ECT357**

Course	TA	TA-1 (5 Marks)	TA-2 (5 Marks)
Total Credits = 03 End Semester Examination=60 Continuous Assessment Examination = 40 **(Test1=15 marks Test2=15 marks TA =10 marks)**	**Mode of TA**	Individual different problem assignment in Classroom	Individual different problem assignment in Classroom
	Schedule	As per Academic Calendar	As per Academic Calendar
	Medium of submission	Hard Copy	Hard Copy

Dr. R. B. Raut Prof. N. B. Chakole Dr. P. K. Parlewar

Name and Signature of Course Coordinators **HoD, EC Dept.**

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Teacher's Assessment-1 (T.A-1)

P) An IP block 210.110.0.0/19 has been provided to you. Design a network which has a number of subnets equal to twice of your Roll No. (e.g. if your roll no. is 16 then the number of subnets you have to create are 32.) Determine the maximum number of hosts each subnet can have. Write the 1st and last IP address of each subnet. Roll no. 6 onwards are required to write the 1st and last IP address of ANY FIVE subnets. (C05)

Please note that since all zeros and all ones in IP address represent network address and broadcast address respectively, the host in each subnet cannot have all zeros and all ones in IP address.

Proposed Solution: for Roll No. 70

Given Roll No. 70, we need to create 140 subnets (twice the roll number) from the provided IP block 210.110.0.0/19.

- **Determining Subnet Mask:**
- The subnet mask for the given IP block /19 is 255.255.224.0. This provides 13 bits for subnetting.

- **Calculating the Maximum Number of Hosts per Subnet:**
- Since we have 13 bits for subnetting, there are 2^13 = 8192 possible subnets.
- However, we are tasked to create only 140 subnets. Therefore, we have to borrow more bits for subnetting.
- Let's borrow 7 more bits, so we now have 20 bits for subnetting.
- With 20 bits for subnetting, we have 2^20 = 1048576 possible subnets.
- Now, the remaining bits for hosts are 32 (total IPv4 address length) - 19 (network bits) - 7 (borrowed bits) = 6 bits.
- Therefore, each subnet can have 2^6 - 2 = 62 hosts (minus 2 for network and broadcast addresses).

- **Calculating Subnet IP Ranges:**
- We will increment the subnet ID by the block size, which is determined by the number of hosts per subnet.
- The block size is 64 (2^6), as each subnet has 62 usable addresses.
- The first subnet is 210.110.0.0/26, and the last subnet is 210.110.253.0/26.

- **Determining the First and Last IP Address for Five Subnets:**

- We will determine the IP addresses for the 70th to 74th subnets.

- **For the 70th subnet:**
- Subnet ID: 210.110.64.0/26
- First IP Address: 210.110.64.1
- Last IP Address: 210.110.64.62

- **For the 71st subnet:**
- Subnet ID: 210.110.128.0/26
- First IP Address: 210.110.128.1
- Last IP Address: 210.110.128.62
- **For the 72nd subnet:**
- Subnet ID: 210.110.192.0/26
- First IP Address: 210.110.192.1
- Last IP Address: 210.110.192.62

- **For the 73rd subnet:**
- Subnet ID: 210.110.0.64/26
- First IP Address: 210.110.0.65
- Last IP Address: 210.110.0.126

- **For the 74th subnet:**
- Subnet ID: 210.110.0.128/26
- First IP Address: 210.110.0.129
- Last IP Address: 210.110.0.190

Subnet Number	Subnet ID	First IP Address	Last IP Address	Number of Hosts
70	210.110.64.0/26	210.110.64.1	210.110.64.62	62
71	210.110.128.0/26	210.110.128.1	210.110.128.62	62
72	210.110.192.0/26	210.110.192.1	210.110.192.62	62
73	210.110.0.64/26	210.110.0.65	210.110.0.126	62
74	210.110.0.128/26	210.110.0.129	210.110.0.190	62

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Teacher's Assessment-2 (T.A-2)

Q.1(CO-3) Obtain the **Hamming code** of appropriate length for the digital data. Digital data is related to your class roll number. Also introduce an error in the code & transmit it and correct the code on the receiver side.

If you roll no is below 16, the digital data would be of 4-bit. E.g. If the roll number is 14 then it would be represented using 4-bits as 1110. Assume MSB is data bit d.

If your roll no. is between 16 and 105, digital data would be represented appropriately with 11-bits. E.g. If the roll number is 69 then it would be represented using 11 bits as 10001010000. Assume MSB is data bit d_1.

Q.2 (CO-3) Obtain the **CRC code** for the digital data. Digital data is your class roll number. Use $\mathbf{x^3 + x + 1}$ as a generator polynomial. Also introduce an error in the code & transmit it and correct the code on the receiver side.

Represent your roll number with 7 bits and add prefix 1 as an 8th bit MSB.

E.g. 1) If the roll number is 69 then it would be represented using 7 bits as 1000101 then add prefix 1 at the MSB. Now the number 69 is represented as 11000101

E.g. 2) If the roll number is 8 then it would be represented using 7 bits as 0001000 then add prefix 1 at the MSB. Now the number 8 is represented as 10001000.

Q.3(CO-2) Determine public key and private key to encrypt and decrypt the first four letters of your name using the **RSA algorithm.** Given that **n = 35.**

N.B.Chakole