


| Name: | |  | |
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| Enrolment No: | | | |
| UPES End Semester Examination, May 2024 | | | |
| Course: Data Communication Program: B.Tech (Electronics and Communication Engineering) Course Code: ECEG3047 | | Semester: VI Time : 03 hrs. Max. Marks: 100 | |
| Instructions: Answer all the sections | | | |
| SECTION A (5Qx4M=20Marks) | | | |
| S. No. | | Marks | CO |
| Q1 | Elaborate the OSI model | 4 | CO1 |
| Q2 | Interpret the levels of addressing used in TCP/IP protocols | 4 | CO1 |
| Q3 | Compute the minimum hamming distance for the following coding scheme: (00,000), (01,011), (10,101) and (11,110). Note: Read the coding scheme as (data word, corresponding codeword) | 4 | CO2 |
| Q4 | Explain the subnetting utilized by network layer to maintain security | 4 | CO3 |
| Q5 | Discuss the topologies in physical layer which act as geographical representation of linking devices. | 4 | CO4 |
| SECTION B (4Qx10M= 40 Marks) | | | |
| Q6 | Elucidate the layers of the reference model that provides a common basis for coordination of standards development for systems interconnection | 10 | CO1 |
| Q7 | Demonstrate the following coding schemes for error detection and correction: (a) Consider the dataword send by sender is 1011. The codeword created from this dataword is 10110, which is sent to the receiver. Illustrate the conditions to check whether the error is detected in the codeword using parity check coding. Compute the hamming distance for this transmission if this is error-free OR (b) Consider the dataword send by sender is 1000. Calculate the appropriate codeword of this dataword and hamming distance for the error-free transmission from sender to receiver using the conditions of Hamming code. | 10 | CO2 |
| Q8 | Consider the IP address is 192.68.38.40/30 | 10 | CO3 |

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| | (a) Calculate the subnet mask used for sub-netting. (b) Calculate the default subnet mask. (c) Convert into Binary and Hexadecimal form. (d) Calculate the number of networks that can be created. (e) Compute the total number of host that could be assigned the IP address. | | |
| Q9 | Examine the transmission impairment and performance analysis of the signals for data communication | 10 | CO4 |
| SECTION-C (2Qx20M=40 Marks) | | | |
| Q10 | Analyze the services provided by network layer, datagram and virtual circuits. | 20 | CO3 |
| Q11 | (a) Explore the process of converting binary data into a sequence of bits of the digital signal and is related to the digital PAM formatting OR (b) Explore the wired or bounded transmission medium where transmitted signals are directed and confined in a narrow pathway by using physical links | 20 | CO4 |