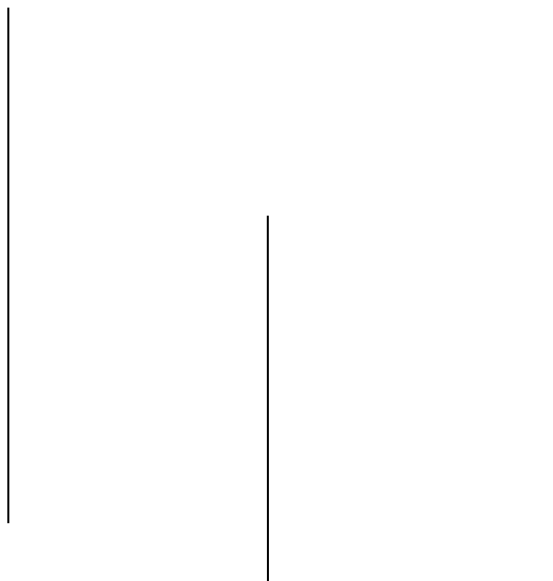# COMPREHENSIVE PROJECT REPORT

ON

LAN INFRASTRUCTURE DESIGN

UNDER THE GUIDANCE OF

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Submitted by

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B.TECH Semester III (2019-2023)

Application of this project:

➢ As we all know how important communication systems are for human beings.

➢ So, in this project I would like to explain how shortest distance is found in network design as well as make software for it, which would be very easy to use, and would be password protected. It would also enable to find expenditure on cable, optical fiber are required or not, internet speed, total expenditure etc. It would also reduce time and will be efficient.

Work done So Far:

➢ What is graph theory?

➢ Informally, a graph consists of a non-empty set of vertices (or nodes),and a set E of edges that connect (pairs of) nodes.

➢ But different types of graphs (undirected, directed, simple, multi-graph) have different formal definitions, depending on what kinds of edges are allowed

➢ In this project I used undirected weightage graph and why I used BFS?

Why use Breadth First Search

➢ Breadth-first search (BFS) is a general technique for traversing a graph.
➢ Queue Data Structure is used
➢ Complete
➢ Optimal
➢ Cover level by level

Example of En-queue and De-queue Operations are given

Q) Which Algorithm is used and why it is used instead of other similar Algorithms?

➢ Dijkstra Algorithm is used and answer to the why part is explained in the project along with the steps and all other required things.

SUPPLIES REQUIRED

> - We would also like to add material of wire needed for example if(distance<=25 unit) then we would like to add normal Twisted Pair Cable(T.P.C) and LAN but if the distance between 2 node is more than 25 unit then we would like to change material to coaxial cable and MAN but if the distance between 2 node is more than or equal to 100 unit then we would like to change material to optical cabe and WAN it because if we would have used T.P.C and coaxial cable the speed of transmission would have been downgraded to a great extent and then LAN and MAN would not be effective.

Topic Covered:

> - In this Project we would cover topics of Discrete mathematics like graph theory (**graph theory** supports easy to implement and iterate over small edges. It is a nonlinear data structure. Graph theory can be easily be uesd to find a shortest distance between two point using *Dijkstra algorithm* etc.) Another topic is random function, .It majorly focuses on topics like Graph theory and classes and object.

> - In this project we use c++ language because c++ language is Object-oriented language (object oriented language focus on data with programming this language provide data security and reusability)

> - Portability: C++ offers the feature of portability or platform independence while allows the user to run the same program on different operating systems or interfaces at ease.