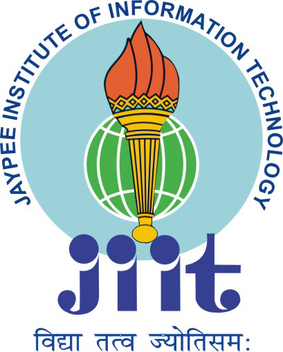
**­­FIBER OPTICS Parameters**



Physics lab 2 -PROJECT

**Student’s Details-**

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**Faculty - Dr. Sandeep Chhoker sir ,**

**Associate Professor, JIIT NOIDA**

**Preface**

We have made this report file on the topic Fiber Optics Parameters. We have tried our best to elucidate all the relevant details to the topic in the report. While in the beginning , We have tried to give a general view about this topic. Our efforts and whole hearted cooperation of each group member has ended on a successful note. We express our sincere gratitude to Dr. Sandeep Chhoker who gave us this golden opportunity which helped us to get a much clear understanding on Fiber Optics. We thank him for providing us the reinforcement, confidence and most importantly the track for the topic whenever we needed it.

**COMPILANCE CERTIFICATE**

For fulfilment of project based learning requirement pertaining to physics lab 2 course taught by Dr.Sandeep Chhokerduring semester 2 of academic year 2021-22.

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Batch:F8

UNDER SUPERVISION OF-

**DR. Sandeep Chhoker sir**

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**INTRODUCTION**

Fiber optics, or optical fiber, refers to the technology that transmits information as light pulses along a glass or plastic fiber. A fiber optic cable can contain a varying number of these glass fibers -- from a few up to a couple hundred. Another glass layer, called *cladding*, surrounds the glass fiber core. The buffer tube layer protects the cladding, and a jacket layer acts as the final protective layer for the individual strand. Fiber optic cables are commonly used because of their advantages over copper cables. Some of those benefits include higher bandwidth and transmit speeds. Fiber optics is used for long-distance and high-performance data networking. It is also commonly used in telecommunication services, such as internet, television and telephones.

**PROBLEM STATEMENT**

The problem statement of the report is to find various parameters such as critical angle, numerical aperture, number of modes, cut off parameters, critical radius, attenuation coefficient etc. when certain other parameters are given such as refractive index of core, refractive index of cladding, diameter of core, angle of incidence of light, length of fiber etc.

This problem could be resolved via a c++ code where by just inputting some values we could get each and every desired parameter of fiber optics.

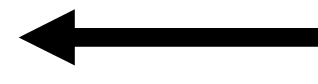
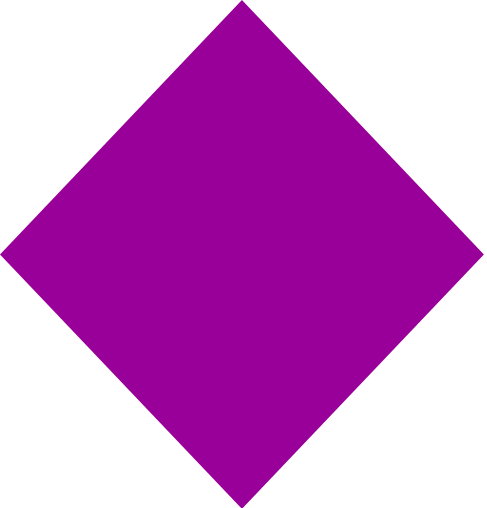
Graphical representation of algorithm of the same is followed.

**METHODOLOGY**

Flow chart



Take Password



Take Password

STOP

IF



False

2

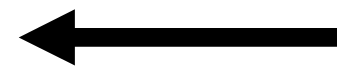
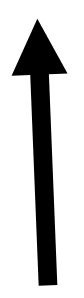


MENU

switch

True

(For Fiber Optics and Stop)

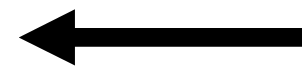
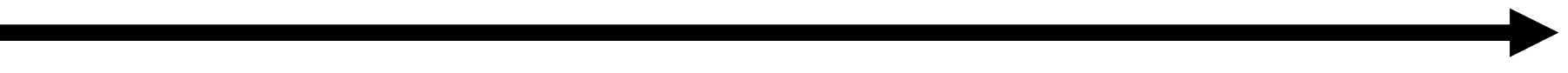
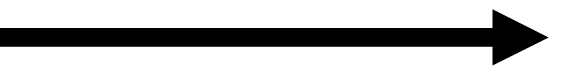
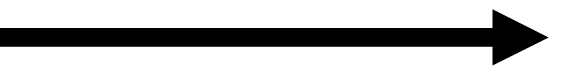
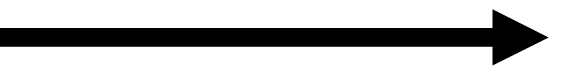
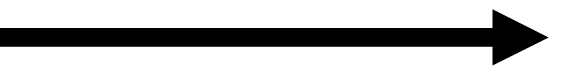
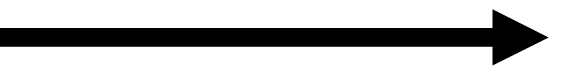
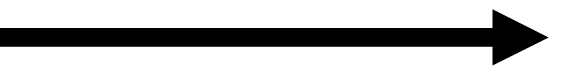
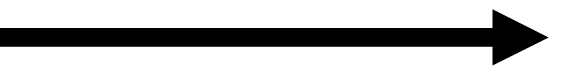
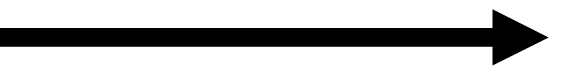
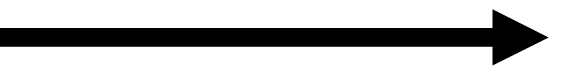
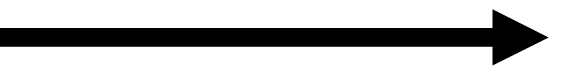
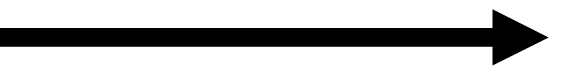
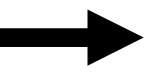
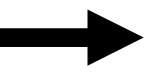
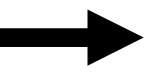
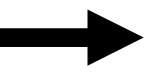
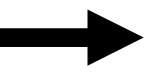
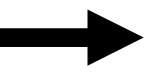
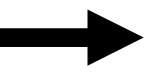
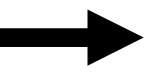
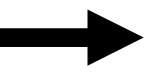
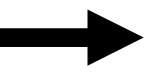
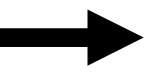


MENU

1

switch

(For Calculations)



Numerical aperture

Relative Refractive Index

Acceptance Angle

V number & Modes

Attenuation Coefficient

Output Power

Input Power

Length of Fiber

Numerical aperture of GRIN

Critical Radius

Application

1

2

3

4

5

6

7

8

9

10

11

\*

Explanation-

We have used C++ language to implement above flow chart.We form a class named FiberOptics and define 11 member functions in it as given in flow chart.In the driver code main, we asked the choice from user to enter 1 for fiber optics calculations and 2 exit.If user chooses one then again we provide choice to select any one calculation and hence we call the corresponding member function to perform the required calculation.

**SPECIAL FEATURES:**

1:PASSWORD:This feature provides only owner access. So, no other can access the application if he/she is not aware about password.

2:BEEP SOUND: Whenever user will enter wrong input then immediately a beep sound will be created followed by “Wrong input!” statement.

3:COLOR VARIENT: Different colours in different functions are used by us to make code output interactive and best looking.

4:PATTERNS:Different patterns at different positions are used to make project good looking.

5:USER FRIENDLY: Instructions are properly given at every statement and

6:ERROR HANDLING : Code is written in such a way that it can handle any wrong input by the user at any time and at any place.

7-COMMENTS : It is very easy to understand code with the help of comments provided in the code at all relevant and required places.

**RESULT**

We had tried to cover each and every aspect of fiber optics that was taught to us. We had tried to deal with every parameter and every formulae such as critical angle, numerical aperture, number of modes, critical radius ,V number and one could easily get these parameters with minimal requirement of several other parameters.

We had learnt a lot from this project.

Extreme concept clarity, improved coding skills and even we learnt how to deal in a group.

We are thankful that we are given this self learning based opportunity that at last had amended us.

**FUTURE SCOPE**

Today’s global businesses demand faster, more secure and larger capacity communication systems for their network operations. Fiber optic technology is expected to play a major part in this growth. A research and market study determined that the compound annual growth rate for the fiber optic market could reach 8.5 percent by 2025, meaning more industries will be looking to the solutions presented by this technology. From healthcare systems to the marine environment, fiber optic cable is proving to be a crucial component of industrial infrastructure.

Fiber optic cable assemblies are also playing an increasingly vital role in residential applications. Homeowners now expect high-speed internet access as part of their daily lives, and telecom and data industry leaders are turning to fiber optic technology as a clean, reliable way to provide expected services. In the next five years and beyond, contractors expect to use fiber optic cable for improved connectivity in a wide variety of projects.

**REFERENCES**

1. <https://www.google.com/search?q=fiber+optcs&oq=fiber+optcs&aqs=chrome>
2. <https://www.verizon.com/info/definitions/fiber-optics/#:~:text=Fiber%20optics%20is%20the%20technology,or%20plastic%20over%20long%20>
3. <https://www.thorlabs.com/navigation.cfm?guide_id=26&gclid=Cj0KCQjw1N2TBhCOARIsAGVHQc5YH9uqI6o5DObxvoZ_XGQoZsvw4nMmI7Q8hP0vksFLfcg7EP4PK9saAr3HEALw_wcB>
4. <https://classroom.google.com/c/NDU5MDYyMjkyMDQ2>