



Answer the following questions, assume any missing data, do not write more than two pages in each question

Write a technical report of your choice regarding prosthetic organs. (25 points)

Answer:

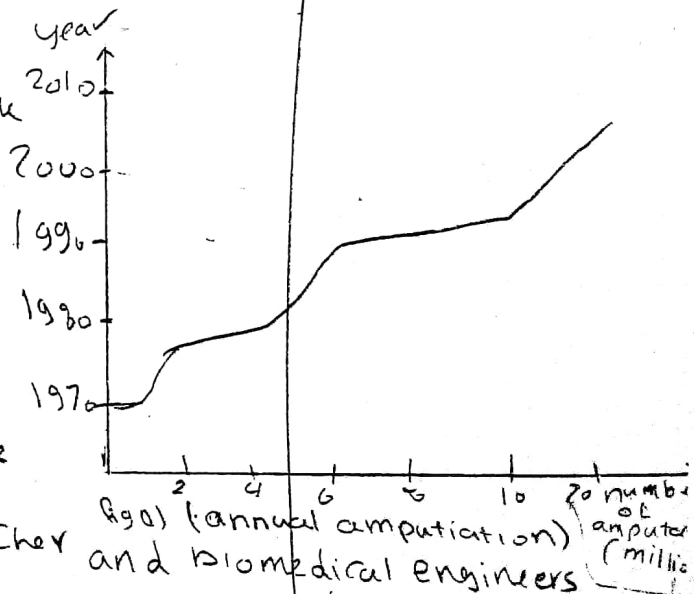
Prosthetic Limbs From wooden limbs to bionic limbs

- Abstract:-

Everyday activities take the normal people little time and effort to do, while doing these activities is a daily challenge for amputees who lost all or a part of their upper limbs or lower limbs. Prosthetic limbs were created to allow amputees to have a replacement for their lost limbs but they did not function as the natural ones until the invention of bionic limbs. So this report will give an overview on the history of prosthetic limbs and will discuss the mechanism of working of bionic limbs.

- Introduction

According to statistics there are one million annual limb amputation globally or every 30 seconds⁽¹⁾. This huge number of people can not live their lives normally and normal prosthetic limbs allow them very limited movement and put pressure on their bodies. Doctors, researchers and biomedical engineers have collaborated and used bionics (the application of natural systems on engineering mechanisms) to invent to nerves controlled bionic limbs.



- the history of prosthetic limbs.

In the year 2000, researchers in Cairo, Egypt discovered the oldest documented artificial limb, a toe made of wood and leather. Even pirates used prosthetic limbs, they used wooden rods as legs. As time pass by, prosthetic limbs were made to look like real ones, but did not do the same functions. As the joint technology and suction attachments continued to progress, in 1812 an artificial arm was made and it was controlled by connecting straps with the other shoulder. Research kept going, and in the year 2004 the first bionic arms was tested for the first time.

How does the nerves-controlled bionic limb work?
Measurements are taken by doctors and engineers to make an ideally fitting limb. After that the bionic limb is attached to the body. The movement of the bionic limb is allowed by amplifying muscles signals sent by the brain when a person intends to move. To accomplish this doctors redirect the muscles of the amputated limb within the upper part of the limb allowing the muscles contractions. In a technique known as targeted muscles' reinnervation one hundred sensor is embedded in the bionic limb to measure the electric pulses raised by both reinnervated muscles and limbs muscles contractions. When this information and other data from the sensor are combined the bionic limb moves as intended by the person.

References:

- (1) the global agency for public mobilization and statistics.
- (2) David William, union of man and machine, nature, August 2015.
- (3) Michael Freeman, the history of prosthetic organs, science, February 2014.

Folding bicycle

A Solution for pollution and traffic jams

- Project abstract:-

Cities around the world are suffering from two major problems which are pollution and traffic jams. Folding bicycle is the solution, not only it has the same advantages of the normal bicycles - being eco-friendly and causing no traffic jams - but it is also portable. Folding bicycle can be taken with you everywhere you go. Although there have been folding bicycles invented, but our version is lighter, stronger and more efficient. The objective of the project is to produce a prototype of the folding bicycle and the goal is to have a production line for it in the near future.

- Introduction:

The Egyptian Central Agency of Public Mobilization and Statistics announced that by the end of year 2015, the number of licenced vehicles has reached 8.6 million vehicles. And this is the major source of pollution and crowd. So there had to be a solution for this problem which is folding bicycle, which is the best alternative choice of transporting in cities.

- Qualifications:

- Biomedical engineering student with GPA 3.88.
- Internship in ABC Bikes.
- Summer program training in ES Steel.
- Member of the first prize winner team in DMT design competition

-plane of work:-

Design of bicycle	January, 1st, 2019
Manufacturing of bicycle	January, 30, 2019
Testing the bicycle	March, 1st, 2019
Survey about bicycle	March, 12, 2019
Finishing of the bicycle	March, 30, 2019

Budget:-

Requirements	Quantity	Price = (₹)	total (₹)
5 meters of 3cm diameter fibro-carbon pipes	1	1550	1550
Plastic handel	2	30	60
Hinges	5	5	25
bicycle wheels	2	100	200
			1835

Conclusion:-

Folding bicycle is surely a successful project and has no risks. It is suitable for everyone to use because its size is optimizable. The one who uses folding bicycle not only will have a chance to decrease pollution and traffic jams but also he will have a better health.

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