A

Seminar Report On

QUANTUM COMPUTING

Under the company "A R QUATNS"
submitted in partial fulfillment of the requirement for the award of

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE & ENGINEERING

Submitted by:

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Submitted to:

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA
(A Central University)
BILASPUR, CHHATTISGARH

2024-2025

INTERNSHIP COMPLETION CERTIFICATE

Certification Letter

AR Quants

Date: - 19/08/2024

To whom it may concern,

This is to certify that **Aditya Singh Chauhan**, B.Tech. in Computer Science & Engineering, student of **Guru Ghasidas Vishwavidyalaya, A Central University, Bilaspur**, has successfully completed his internship with AR Quants during the period **10/05/2024-30/06/2024.**

During g the period, He had worked with various teams where majorly he was working with Research & Development team and sincerely learn and contribute in the field of Quantum Computing.

During the course of internship, Aditya has shown great amount of responsibility, sincerity and a genuine willingness to learn and zeal to take on new assignments & challenges. In particular, his coordination skills and communication skills are par excellence and his attention to details is impressive.

We extend our best wishes to Aditya for a prosperous and rewarding future.

Sincerely,
Abhishek Bhanushali
Founder of AR Quants

Signature

AR Quants
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CHAPTER 1

1.0 INTRODUCTION

With the development of science and technology, leading to the advancement of civilization, new ways were discovered exploiting various physical resources such as materials, forces and energies. The history of computer development represents the culmination of years of technological advancements beginning with the early ideas of Charles Babbage and eventual creation of the first computer by German engineer Konard Zeise in 1941. The whole process involved a sequence of changes from one type of physical realization to another from gears to relays to valves to transistors to integrated circuits to chip and so on. Surprisingly however, the high speed modern computer is fundamentally no different from its gargantuan 30 ton ancestors which were equipped with some 18000 vacuum tubes and 500 miles of wiring. Although computers have become more compact and considerably faster in performing their task, the task remains the same: to manipulate and interpret an encoding of binary bits into a useful computational result.

The number of atoms needed to represent a bit of memory has been decreasing exponentially since 1950. An observation by Gordon Moore in 1965 laid the foundations for what came to be known as "Moore's Law" – that computer processing power doubles every eighteen months. If Moore's Law is extrapolated naively to the future, it is learnt that sooner or later, each bit of information should be encoded by a physical system of subatomic size. As a matter of fact this point is substantiated by the survey made by Keyes in 1988 as shown in fig. 1. This plot shows the number of electrons required to store a single bit of information. An extrapolation of the plot suggests that we might be within the reach of atomic scale computations with in a decade or so at the atomic scale however.

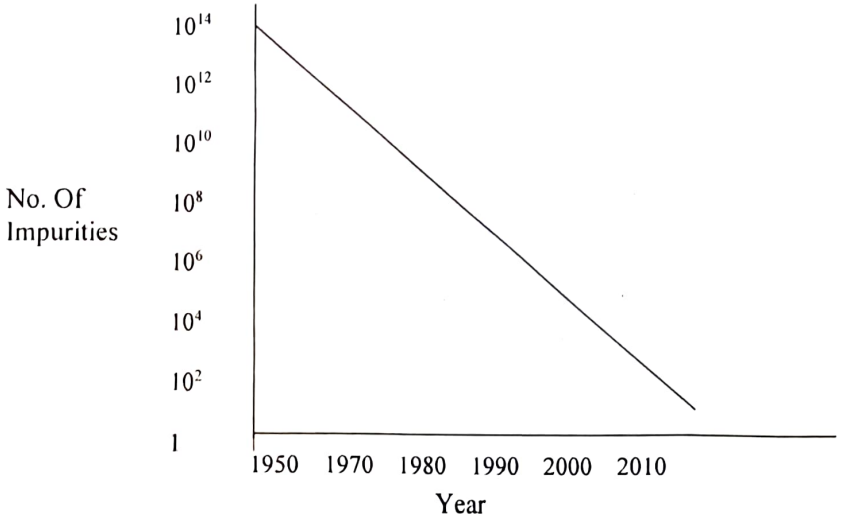

Fig 1: Showing number of dopant impurities in logic in bipolar transistors with year.