**INTRODUCTION TO MEMS**

MEMS is an abbreviation for Microelectronic. This is an integration of sensors, mechanical elements, acquitters, and operating electronics on a common silicon sub strip with the use of a technology known as microfabrication technology. While the electronic circuits (analog and digital) are fabricated using blab la the micromechanical part is made by micro machining. During the micro machining techniques, you selectively edge a weigh the parts of the silicon weaver, or add new structural layers to form the required mechanical devices. Microelectronic integrated circuit handle the signal processes while the micro machine parts serve as sensors and acquitters which allow the microsystems to sense and control the environment.

**Components of MEMS**

* Microsensors
* Micro- acquitters
* Micro-Electronics
* Micro-structures.

**Advantages.**

Since MEMS are manufactured by batch fabrication techniques, high levels of functionality, reliability and sophistication can be placed on a small silicon chip that are relatively low cost.

MEMS promises to revolutionize every category by bringing together silicon based microelectronics with micromachining technology hence making possible the realization of a complete system on a chip.

**Advances in Micro-electronics**

Polymerasic Reaction – It is a common laboratory technique used to make many copies of a particular region of DNA.

Atomic Forced Microscope – These are techniques that can take images of any type of service which include, Ceramics even biometric samples.

Scanning microscopy – This enables you to scan a surface at a distant.

**Preparation of MEMS**

**Micro-machineing -** It is the process of machining very small parts with tools that are small than 0.015 inch in diameter and tolerate small inches. It can create very parts that are required for a particular application.

MicroFabrication – Try to bring pieces together.

**Micro-Mechanics – blank**

**Materials**

Material may play either active or passive or both roles.

**Passive material** provide mechanical structure or electrical connection.

**Active materials** – These materials are essential to the sensing process used in the various types of microsensors such as PSELECTRIC etc.

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| Silicon | Density of 2330kg/m2.  Melting point 1414.  Dielectric constant 11.7.  Young’s Formula is 190.  The forbidden gap 300 degree is 1.12. |
| GAAS Aserniac | Density of 5216 kg/m2  Melting point 128  Dielectric constant 12  Forbidden gap 400 degree is 1.247 |
| Silicon Oxide | Density of 2200/m2.  Melting point 1600.  Dielectric constant 4.5.  Young’s Formula is 380.  No Forbidden Gap |
| Cilium Nitrite | Density of 150kg/m2.  Melting point 2500.  Dielectric constant 4.  The forbidden gap 300 degree is 3.2. |

Physical Properties of metallic materials

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| --- | --- |
| Aluminum | Density of 2689kg/m2.  Melting point 660.  Dielectric constant 117.  Young’s Formula is 70.  The forbidden gap 300 degree is 1.12. |
| Gold | Density of 19,320 kg/m2  Melting point 1064  Young Formula is 78 |
| Chromium | Density of 7,194kg/m2.  Melting point 1,875.  Young’s Formula is 279.  No Forbidden Gap |
| Titanium | Density of 4,508/m2.  Melting point 1660.  Young’s Formula is 40 |

**Silicon**

It makes up to 26% of the earths crust by weight. Elemental silicon is not found in nature but it occurs in compounds like oxides and silicates. Silicon is prepared by heating silica and charcoal in an electric surface using charcoal electrodes. Silicon is under normal conditions unstable. The major problem with silicon is that many of its properties are temperature dependent. Also, it does not display PISO electric effects and is not electromagnetic. Silicon is not efficient in photo sensing.

**Single Crystalline Silicon**

It is the most widely used semiconductor material. It is cleaned by sonar melting.

**Polysilicon**

These structures are built with \_\_\_\_ elements by iron \_\_\_\_