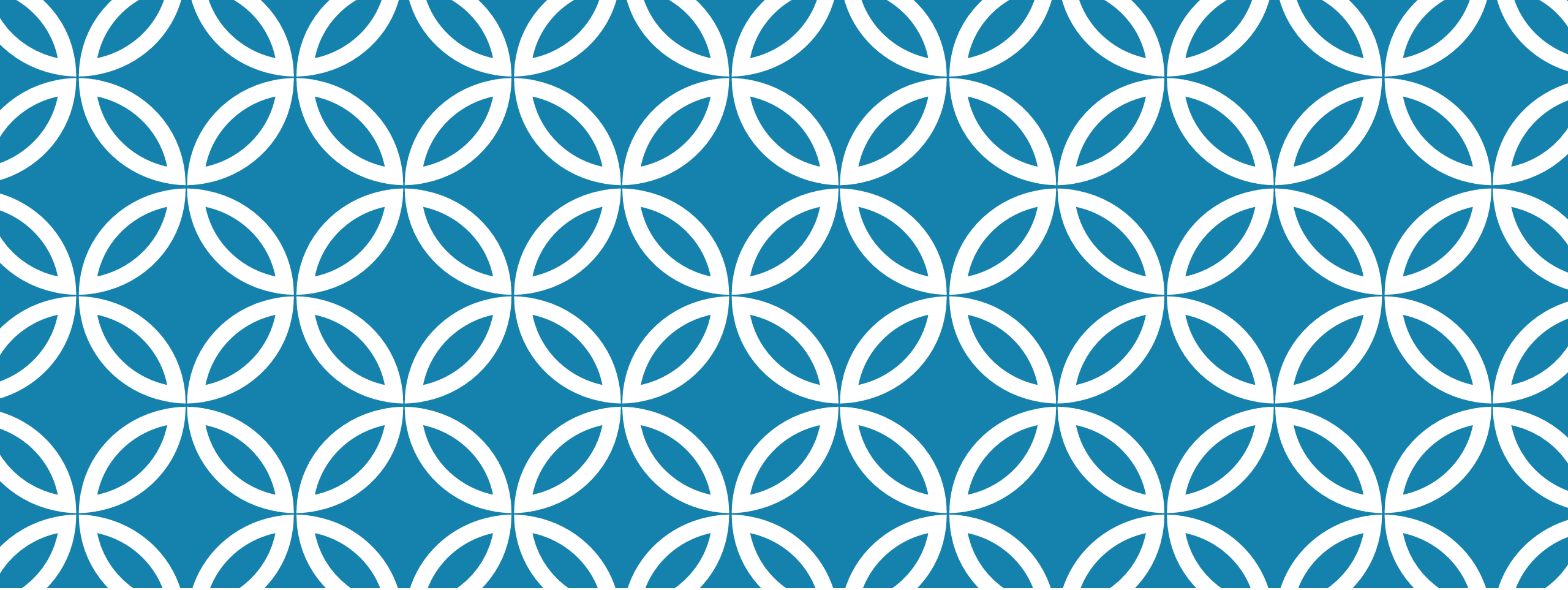


WELCOME

NAME : ROOPESH VETCHA

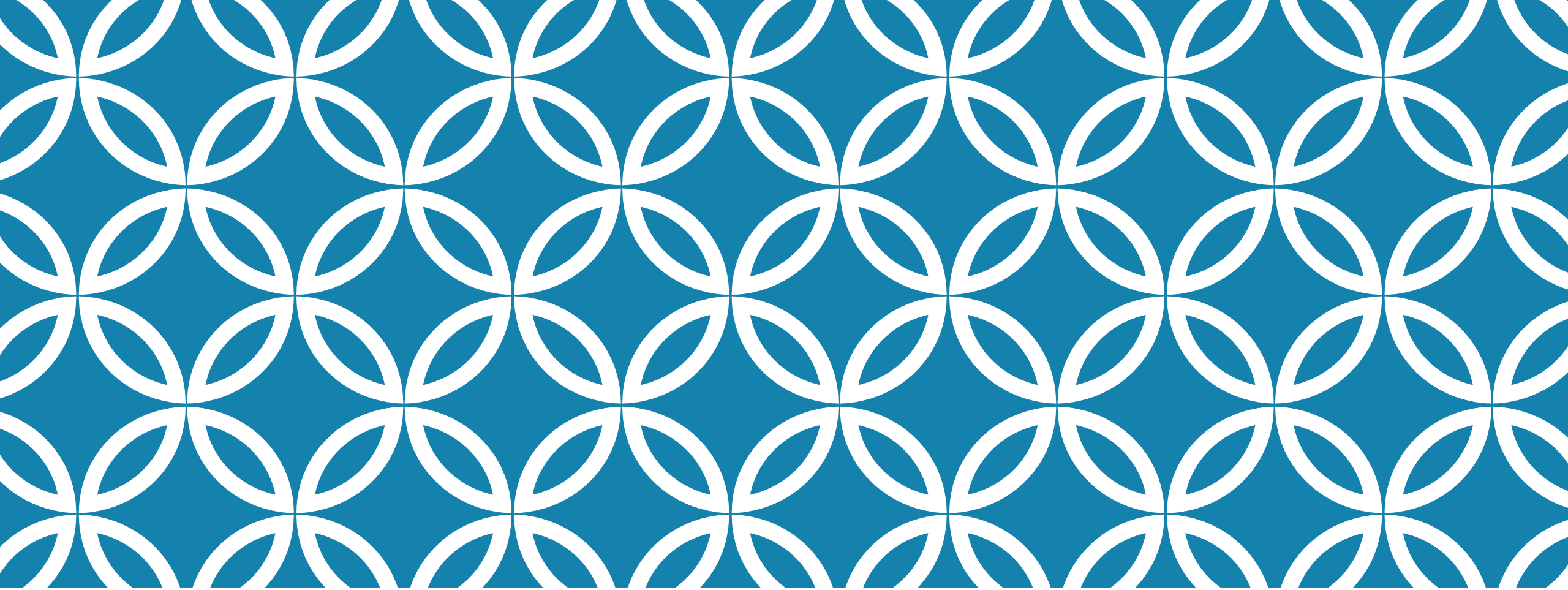
REG NO : 12214928

ROLL NO : RK22CLA20

SECTION : K22CL

COURSE NAME : PHYSICS

COURSE CODE : PHY135



MAGNETIC SWITCH VS MECHANICAL SWITCH

WHAT IS A SWITCH?

In electrical engineering, a **switch** is an electrical component that can disconnect or connect the conducting path in an electrical circuit, interrupting the electric current or diverting it from one conductor to another.

The most common type of switch is an electromechanical device consisting of one or more sets of movable electrical contacts connected to external circuits.

MAGNETIC SWITCHES

Magnetic switch is an electrical switch that makes or breaks contact in the presence of a magnetic field.

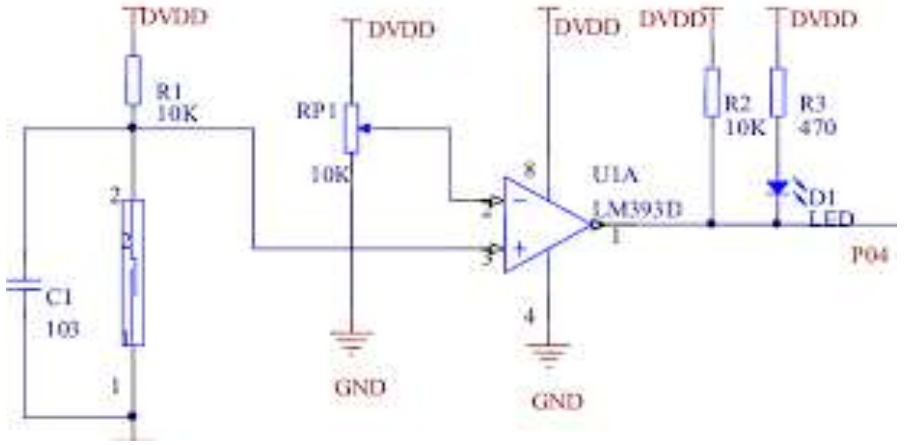
Applications include situations where it is not desirable or possible for moving elements to make direct contact with the switch, such as in explosive environments, submerged in liquids, and where repetitive contact with a mechanical switch would result in undesired wear.

Generally, the switch remains actuated as long as a sufficiently strong magnetic field is present, and opens when the field is removed.

COMPONENTS OF MAGNETIC SWITCH

MAGNET

MAGNETICALLY SENSITIVE SWITCH



PRINCIPLE OF MAGNETIC SWITCH

The switching mechanism is comprised of two ferromagnetic blades, separated by only a few microns.

When a magnet approaches these blades, the two blades pull toward one another.

Once touching, the blades close the normally open (NO) contacts, allowing electricity to flow.

Some reed switches also contain a non-ferromagnetic contact, which forms a normally closed (NC) output.

An approaching magnet will disconnect the contact and pull away from the switching contact.

PRINCIPLE OF MAGNETIC SWITCH

Contacts are constructed from a variety of metals, including tungsten and rhodium.

Some varieties even use mercury, which must be kept in the proper orientation to switch correctly.

A glass envelope filled with inert gas—commonly nitrogen— seals the contacts at an internal pressure under one atmosphere.

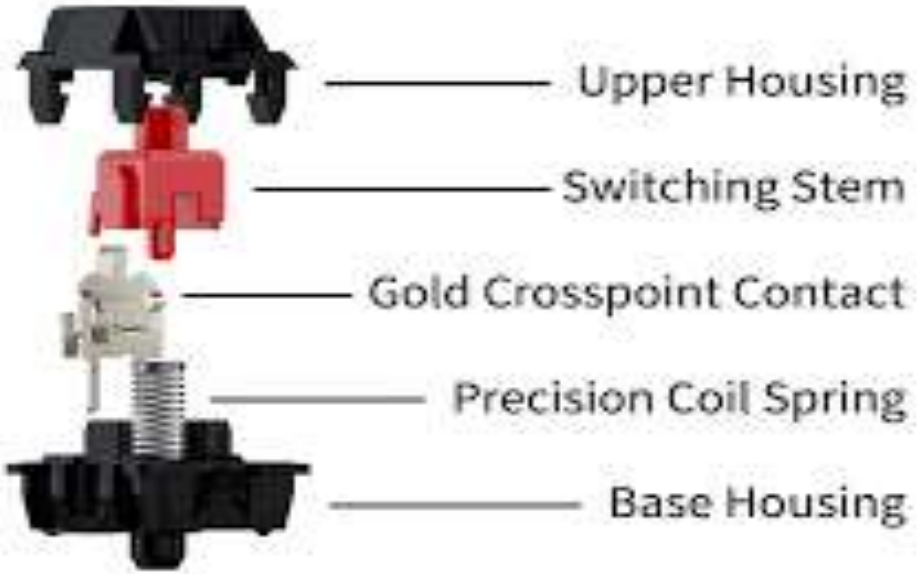
Sealing isolates the contacts, which prevents corrosion and any sparks that might result from contact movement.

MECHANICAL SWITCH

- Mechanical keyboard switches are the mechanisms under the keycaps on a mechanical keyboard that enable you to type faster and more precisely.
- There are three kinds of mechanical keyboard switches: linear, tactile, and clicky.
- Linear switches are the smoothest and fastest, and are generally preferred by gamers.
- Touch typists tend to prefer tactile switches because of the feedback.

COMPONENTS OF MECHANICAL SWITCH

- Upper housing
- Stem
- Crosspoint contact
- Coil spring
- Bottom housing



PRINCIPLE OF MECHANICAL SWITCH

1) The PROCESS PRESSURE :

It makes the measuring element of the pressure switch react. The instruments are therefore designed in two ways. In the case of low process pressures, mechanical pressure switches therefore feature a diaphragm (as a result of the large surface area absorbing the pressure), whereas, at higher pressures, they have a piston with a small surface area.

PRINCIPLE OF MECHANICAL SWITCH

2) THE FORCE O F THE PRELOADED STRING :

This is adjusted via the adjustment screw of the pressure switch. The further the screw is turned in, the stronger the force of the spring that the measuring element has to overcome. This is accompanied by an increase in the switch point's value. The spring geometry is designed based on the required switching range. In accordance with the functional principle of the mechanical pressure switch, the switch point is defined by the degree of spring preload. It is set when the pressure increases, and the reset point is set accordingly when the pressure decreases.

COMPARISION

SPECIFICATIONS	MAGNETIC SWITCH	MECHANICAL SWITCH
SENSING DISTANCE - TOUCH	Up to 40 mm efficiently	Touch (zero distance)
POWER REQUIRED ALL TIME	No	No
INPUT REQUIREMENTS	External Magnetic Field > 5 gauss	Mechanical Force
HYSTERESIS	Ability to adjust , to meet design request	Differential Travel (D.T)
LIFE EXPECTANCY	10^10 cycles	10^6 cycles
SWITCHING VOLTAGE	Up to 200V	250VAC
SWITCHING CURRENT	Up to 3A / Up to 5A	Up to 25A

COMPARISION

SPECIFICATIONS	MAGNETIC SWITCH	MECHANICAL SWITCH
SWITCHING LOAD MINIMUM	No load required	50mW
SWITCHING LOAD MAXIMUM	Up to 100 Watts	Up to 5,000 Watts
INSULATION RESISTANCE	10^14 Ohm	10^9 Ohm
CONTACT RESISTANCE	50 milliohm	100 milliohm
NOISE	Almost no switching noise	Switching noise
OVERLOAD	Very Sensitive	Insensitive
ASSEMBLY	20,000 pcs	5,000 pcs

CONCLUSION

After the above discussion, we conclude that magnetic switches are better than mechanical switches on the basis of it's :

- Switch on/off quickly
- Less contact resistance
- Longer lifespan
- Lower maintenance costs/requirements
- More difficult to override

THANK YOU