1.Differentiate coulomb force and gravitational force.

S. No.	Coulomb Force	Gravitational Force
1	It acts **between two charges**	It acts **between two masses**
2	It can be **attractive or repulsive**	It is **always attractive**
3	It is always **greater in magnitude**	It is **always lesser** in magnitude
4	It **depends** on the nature of the medium	It is **independent** of the medium
5	If charges are in motion, another force called Lorentz force come in to play in addition to Coulomb force	Gravitational force is the same whether two masses are at rest or in motion
6	The value of the constant **k** in Coulomb law **$k = 9 \times 10^9\ Nm^2\ C^{-2}$**	The value of the gravitational constant **$G = 6.67 \times 10^{-11}\ Nm^2\ kg^{-2}$**

2.Differetiate electrical energy and power.

S. No.	Electric Energy	Electric Power
1	Work has to be done to move the charge from One end to other end of the conductor and this work-done is called electric energy. **$dW = dU = VdQ$**	The rate at which the electrical potential energy is delivered is called electric power. $P = \frac{dU}{dt}$; $= VI$
2	Its SI Unit is joule (J)	Its SI Unit is watt (W)
3	Its practical unit is **kilowatt hour (kwh) 1 kwh = 3.6×10^6J**	Its practical unit is **horse power(HP)1 HP = 746 W**

3. Distinguish between peltier effect and joule's effect

S. No.	Peltier Effect	Joule's Effect
1	Both heat liberated and absorbed occur	Heat liberated only occur
2	Occurs at junctions	Occurs all along the conductor
3	Reversible effect	Irreversible effect

4. Give the differences between uniform and non uniform magnetic field.

S. No.	Uniform Magnetic field	Non – Uniform Magnetic field
1	Magnetic field is said to be uniform If it has the **same magnitude and direction** at all the points in a given region.	Magnetic field is said to be **non-uniform If the magnitude or direction or both varies** at all its points.
2	(e.g) LocallyEarth's magnetic field is uniform	(e.g) Magnetic field of a bar magnet

5. Differentiate coulomb's law and biot-savart's laws.

S. No.	Coulomb's law	Biot- savart's law
1	Electric field is calculated	Magnetic field is calculated
2	Produced by a scalar source (i.e) charge 'q'	Produced be vector source (i.e.) current element $\mathrm{I}\vec{dl}$
3	It is directed along the position vector joining the source and the point at which the field is calculated.	It is directed perpendicular to the position vector and the current element
4	Does not depends on angle	Depends on the angle between and $\mathrm{I}\vec{dl}$ and $\hat{r}$

6.Differentiate step up transformer from step down transformer.

Step up transformer	Step down transformer
If the transformer converts an alternating current with **low voltage in to an alternating current with high voltage** is called step up transformer.	If the transformer converts an alternating current with **high voltage in to an alternating current with low voltage** is called step down transformer.

7. Distinguish between electromagnetic and mechanical oscillations.

Electromagnetic Oscillation	Mechanical Oscillation
This circuit consists inductor and capacitor	This circuit consists spring and block
Charge "q"	Displacement "x"
Current $i = \frac{dq}{dt}$	Velocity$v = \frac{dx}{dt}$
Inductance "L"	Mass "m"
Reciprocal in capacitance $\frac{1}{c}$	Force constant "k"
Electrical Energy $= \frac{1}{2}\left[\frac{1}{c}\right] q^2$	Potential Energy $= \frac{1}{2}kx^2$
Mechanical Energy $= \frac{1}{2}Li^2$	Kinetic Energy $= \frac{1}{2}mv^2$
Electromagnetic energy $= \frac{1}{2}\left[\frac{1}{c}\right] q^2 + \frac{1}{2}Li^2$	Mechanical Energy $= \frac{1}{2}kx^2 + \frac{1}{2}mv^2$

8.Conditions for nature of objects.

Nature of Object / Image	Condition
Real Image	Rays actually converge at the image
Virtual Image	Rays appear to diverge from the image
Real Object	Rays actually diverge from the object
Virtual Object	Rays appear to diverge at the object

9.Differentiate between covex mirror and concave mirror.

Convex Mirror	Concave Mirror
It is a spherical mirror in which reflection takes place at the convex surface and other surface is silvered	It is a spherical mirror in which reflection takes place at the concave surface and other surface is silvered

10.What are the differences between frensel and fraunhofer diffractions ?

Fresnel diffraction	Fraunhofer diffraction
Spherical or cylindrical wave front undergoes diffraction	Plane wave front undergoes diffraction
Light wave is from a source at **finite distance**	Light wave is from a source at **infinity**
For laboratory conditions, **convex lenses need not be used**	In laboratory conditions, **convex lenses are to be used**
difficult to observe and analyze	**Easy to** observe and analyze

11.Differentiate ordinary ray and extraordinary ray.

Ordinary Ray	Extraordinary Ray
They **obey the laws of refraction**	They **do not obey the laws of refraction**
Inside the crystal, they travel with same velocity in all directions	Inside the crystal, they travel with different velocities along different directions
A point source inside the crystal produces spherical wave front for ordinary ray	A point source inside the crystal produces elliptical wave front for extra ordinary ray

12. What is near point and normal focusing ?

Near Point Focusing	Normal Focusing
The image is formed at **near point**	The image is formed **at infinity**
In this position, the eye **feel little strain**	In this position, the eye is **most relaxed** to view the image
Magnification is high $m = 1 + \frac{D}{f}$	**Magnification is low** $m = \frac{D}{f}$

13.Differentiate analog signal from digital signal.

Analog Signal	Digital Signal
It **is continuously varying voltage** or current with respect to time	It contains only **two discrete values** of voltages (i.e.) low (OFF) and high (ON)
These signals are employed in rectifying circuits and transistor Amplifier circuits	These signals are employed in signal processing. communication etc.,

14. what are positive and negative logics ?

Positive logic	Negative logic
Binary 1 stands for +5 V	Binary 1 stands for 0V
Binary 0 stands for 0 V	Binary 0 stands for +5 V

Working of half wave rectifier

During positive half cycle of input AC	During negative half cycle of input AC
Terminal A becomes **positive** with respect to terminal B	**Terminal B** becomes **positive** with respect to terminal A.
The diode is **forward biased** and hence it **conducts**	The diode is **reverse biased** and hence it does **not conduct**
The current flows through the load resistor R_L and AC voltage developed across R_L constitutes the output voltage v_0	**No current passes through R_L** and there is no voltage the drop across R_L. (The reverse saturation current in a diode is negligible)

Working of full wave rectifier

During positive half cycle of input AC	During negative half cycle of input AC
Terminal **M is positive**, C is at zero potential and **N is at negative** potential.	Terminal **M is negative**, C is at zero potential and **N is at positive** potential.
Diode **D_1** is **forward biased**. Diode **D_2** is **reverse biased**.	Diode **D_1** is **reverse biased**. Diode **D_2** is **forward biased**.
D_1 conducts and current flows along the path **MD_1ABC**	D_2 conducts and current flows along the path **ND_2ABC**