

NDA-CDS 2 2024

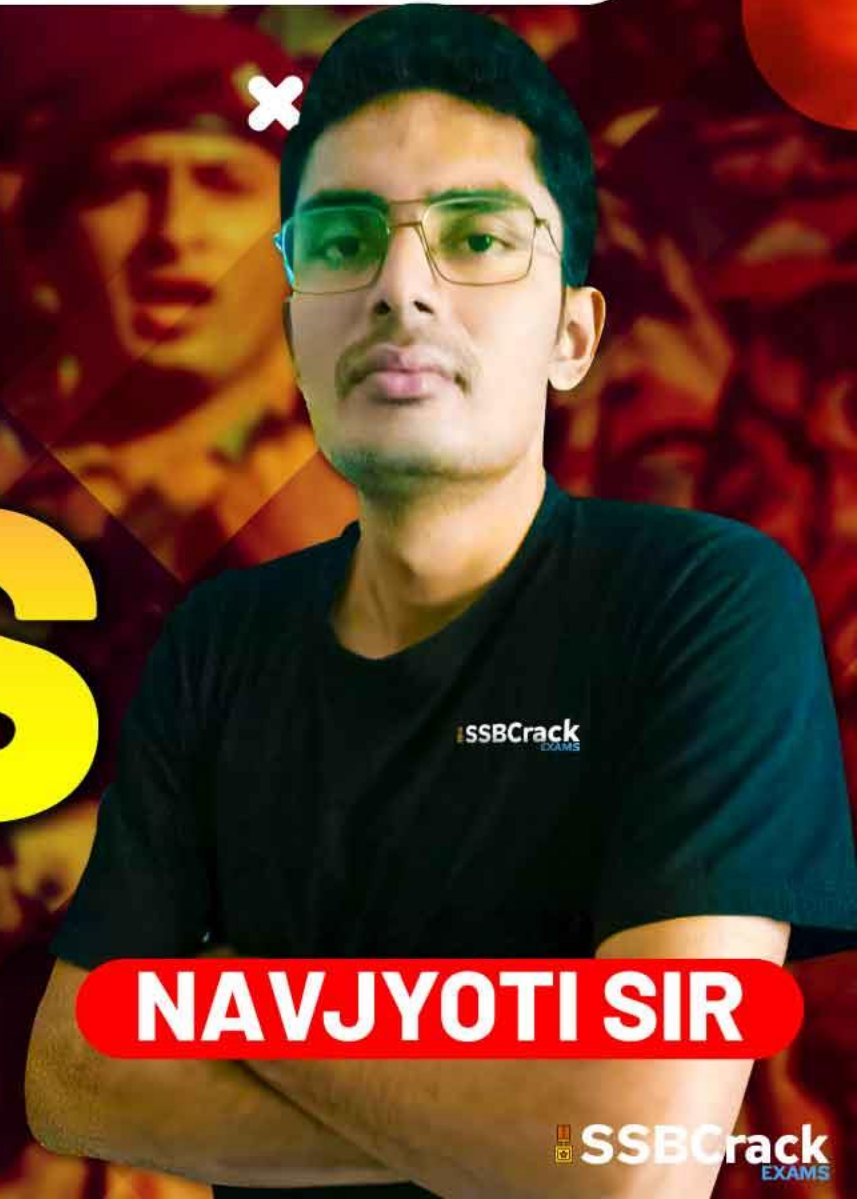
GS

LIVE

PHYSICS

REVISION

CLASS 1



NAVJYOTI SIR

SSBCrack
EXAMS



05 August 2024 Live Classes Schedule

8:00AM -- 05 AUGUST 2024 DAILY CURRENT AFFAIRS RUBY MA'AM

9:00AM -- 05 AUGUST 2024 DAILY DEFENCE UPDATES DIVYANSHU SIR

SSB INTERVIEW LIVE CLASSES

9:00AM -- INTRODUCTION OF OIR & PRACTICE ANURADHA MA'AM

AFCAT 2 2024 LIVE CLASSES

1:00PM -- MAHA MARATHON SESSION

NDA 2 2024 LIVE CLASSES

11:00AM -- GK - HISTORY REVISION - CLASS 1 RUBY MA'AM ✓

12:00PM -- PHYSICS REVISION - CLASS 1 NAVJYOTI SIR ✓

1:00PM -- MATHS REVISION - CLASS 1 NAVJYOTI SIR ✓

2:00PM -- BIOLOGY REVISION - CLASS 1 SHIVANGI MA'AM ✓

5:30PM -- ENGLISH - ADAPTATION OF BORROWED WORDS - CLASS 2 ANURADHA MA'AM ✓

CDS 2 2024 LIVE CLASSES

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3:00PM -- MATHS REVISION - CLASS 1 NAVJYOTI SIR ✓

5:30PM -- ENGLISH - ADAPTATION OF BORROWED WORDS - CLASS 2 ANURADHA MA'AM ✓



REVISION TOPICS :

- **Units and Measurement**
- **Rotational Motion**

Which of the following is a fundamental quantity?

- (a) Velocity
- (b) Force
- (c) Mass
- (d) Acceleration

Which of the following is a fundamental quantity?

- (a) Velocity
- (b) Force
- (c) Mass
- (d) Acceleration

Mass
Length
Temperature
Time
Luminous Intensity
Amount of substance
Electric current

+ 2 supplementary
plane angle
solid angle

Answer: (C)

Which Of The Following Is The Fundamental Unit Of Thermodynamic Temperature ?

- A. K
- B. °C
- C. °F
- D. None of the Above

Which Of The Following Is The Fundamental Unit Of Thermodynamic Temperature ?

A. K *→ Kelvin*

B. °C

C. °F

D. None of the Above

The Symbol To Represent Amount Of Substance Is

- A. K
- B. A
- C. Cd
- D. mol

The Symbol To Represent Amount Of Substance Is

A. K

B. A

C. Cd

D. mol

Amount of substance - mole (mol)

The Smallest Value Which Is Measured Using An Instrument Is Known As

- A. Absolute Count
- B. Precision
- C. Accurate Count
- D. Least Count

The Smallest Value Which Is Measured Using An Instrument Is Known As

- A. Absolute Count
- B. Precision
- C. Accurate Count
- D. Least Count**

Which among the following is a Supplementary Fundamental Unit?

- A. Ampere
- B. Second
- C. Kilogram
- D. Radian

2 supplementary fundamental quantities,
① Plane angle $\xrightarrow{\text{Unit}}$ (radian)
② solid angle $\xrightarrow{\text{Unit}}$ (steradian)

Which among the following is a Supplementary Fundamental Unit?

- A. Ampere
- B. Second
- C. Kilogram
- D. Radian**

The SI unit of Work is

- A. Joules
- B. ergs
- C. volt
- D. Ampere

The SI unit of Work is

- A. Joules si unit
 - B. ergs
 - C. volt
 - D. Ampere
- ergs unit of work
- cm ; g ; second
- $1 \text{ ergs} = 1 \text{ g m}^2 \text{ s}^{-2}$

CGS unit of force

1 dyne \equiv 1 g cm s⁻²

Which of the following is not a unit of time ?

- A. Solar Day
- B. Leap Year
- C. Lunar Month
- D. Parallax Second

Which of the following is not a unit of time ?

- A. Solar Day
- B. Leap Year
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- D. Parallax Second**

What is the unit of Force / Energy ?

- A. second
- B. m^{-1}
- C. kg
- D. m^2

$$\frac{\text{Force}}{\text{Work}} = \frac{F}{F \times d} = \frac{1}{d} \quad \frac{1}{(m)} \equiv m^{-1}$$

(Having same units, quantity can be replaced)

What is the unit of Force / Energy ?

A. second

B. m^{-1}

C. kg

D. m^2

Unit Of Specific Resistance Is

- A. ohm-m²
- B. ohm-m³
- C. ohm / m
- ✓ D. ohm-m

$$R = \rho \frac{l}{A}$$

specific resistance / resistivity

$$\rho = \frac{RA}{l}$$

ohm × m² / m = ohm-m

Unit Of Specific Resistance Is

- A. ohm-m^2
- B. ohm-m^3
- C. ohm / m
- D. ohm-m**

What Is The Unit Of Luminous Intensity ?

- A. mol
- B. kg
- C. Cd
- D. m

What Is The Unit Of Luminous Intensity ?

- A. mol
- B. kg
- C. Cd**
- D. m

Candela → Unit of Luminous Intensity →

Select the pair having the same dimensions,

A. Kinetic Energy and Surface Tension

same units

B. Torque and Potential Energy

C. Momentum and Force

D. Pressure and Energy / Time

(A.) surface tension = $\frac{F}{\text{length}}$ | $W \rightarrow \underline{F \times \text{disp.}}$

(B.) $F \times \vec{r} \equiv (Nm)$ | Pot. energy $\equiv W \rightarrow F \times \text{disp.} \rightarrow (Nm)$

Select the pair having the same dimensions ,

A. Kinetic Energy and Surface Tension

B. Torque and Potential Energy

C. Momentum and Force

D. Pressure and Energy / Time

Electron Volt is the unit of

- A. Luminosity
- B. Force
- C. Frequency
- D. Energy

$$\text{pot. diff.} = \frac{\text{work done}}{\text{charge}}$$

$$W = \text{pot. diff.} \times \text{charge}$$



Electron Volt is the unit of

- A. Luminosity
- B. Force
- C. Frequency
- D. Energy**

Light year is a unit for measurement of

- (a) age of universe
- (b) very small time intervals
- (c) very high temperature
- (d) very large distance

Light year ——— distance travelled by
light in 1 year

Light year is a unit for measurement of

- (a) age of universe
- (b) very small time intervals
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Answer: (D)

The unit of the ratio between thrust and impulse is same as that of

- (a) frequency
- (b) speed
- (c) wavelength
- (d) acceleration

Thrust — force in perpendicular direction

(force)

Impulse — force x time

freq. = $\frac{1}{\text{Time period}}$
(f)

Unit of f = s⁻¹

$$\frac{\text{Thrust}}{\text{Impulse}} = \frac{F}{F \times t} = \frac{1}{t} = \frac{1}{\text{second}} = \text{s}^{-1}$$

The unit of the ratio between thrust and impulse is same as that of

- (a) frequency
- (b) speed
- (c) wavelength
- (d) acceleration

Answer: (A)

The SI unit of pressure is:

- (a) Pascal
- (b) Bar
- (c) Torr
- (d) Atmosphere

The SI unit of pressure is:

- (a) Pascal
- (b) Bar
- (c) Torr
- (d) Atmosphere

Answer: (A)

Precision refers to:

- (a) The closeness of measurements to the true value *Accuracy*
- (b) The smallest value that can be measured *Least count*
- (c) The degree of agreement among several measurements of the same quantity *precision*
- (d) The difference between the measured value and the true value *Error*

Precision refers to:

- (a) The closeness of measurements to the true value
- (b) The smallest value that can be measured
- (c) The degree of agreement among several measurements of the same quantity
- (d) The difference between the measured value and the true value

Answer: (C)

Which of the following is not a common system of unit ?

(a) CGS

(b) MKS

(c) FPS

(d) QRS

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(b) MKS

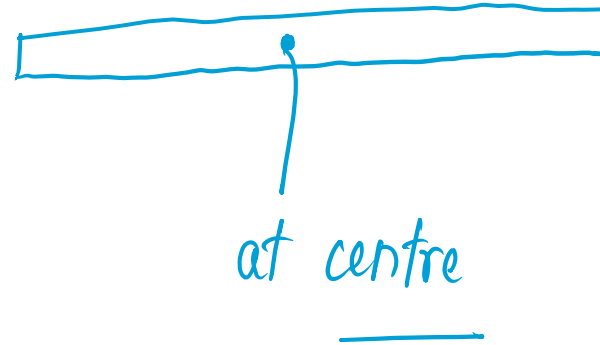
(c) FPS

(d) QRS

Answer: (D)

The center of mass of a uniform rod lies:

- (a) At one end
- (b) At the center
- (c) At one-fourth the length from one end
- (d) At one-third the length from one end



The center of mass of a uniform rod lies:

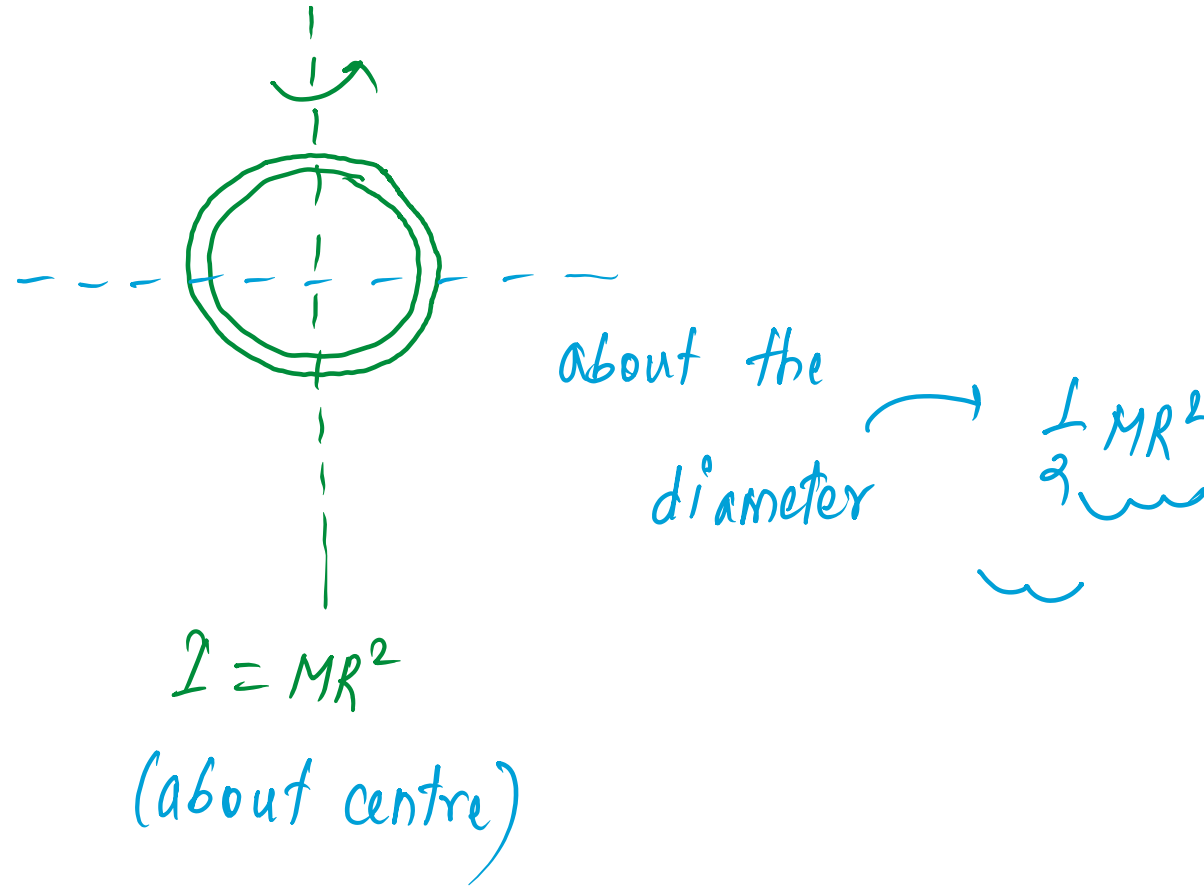
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- (d) At one-third the length from one end

for uniform mass distribution,
centre of mass is at the
geometrical centre.

Answer: (B)

The moment of inertia of a thin circular ring about its diameter is:

- (a) MR^2
- (b) $\frac{1}{2}MR^2$
- (c) $\frac{1}{4}MR^2$
- (d) $2MR^2$



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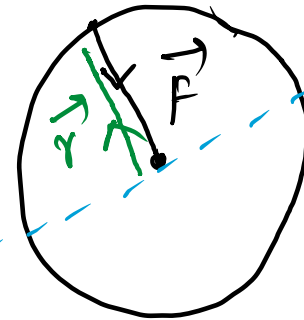
(d) $2MR^2$

Answer: (B)

The torque on a particle of mass m moving in a circle of radius r with uniform speed v is:

- (a) 0
- (b) mvr
- (c) $\frac{mv^2}{r}$
- (d) $\frac{mv}{r}$

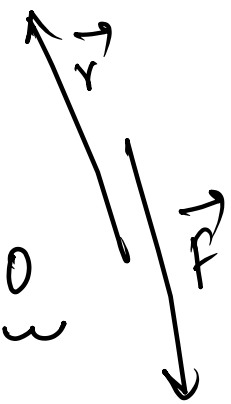
$$\tau = \vec{r} \times \vec{F} = rfs \sin \theta$$



Force directed towards the centre

$$\theta = 180^\circ$$

$$\sin \theta = \sin 180^\circ = 0$$



Torque, $\tau = 0$

The torque on a particle of mass m moving in a circle of radius r with uniform speed v is:

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(b) mvr

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(d) $\frac{mv}{r}$

Answer: (A)

In rolling motion without slipping, the relation between translational velocity v and angular velocity ω is:

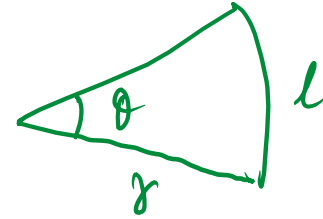
(a) $v = \omega R$

(b) $v = \frac{\omega}{R}$

(c) $v = \frac{R}{\omega}$

(d) $v = \omega^2 R$

$$\theta = \frac{l}{r}$$



$$l = r\theta$$

$$\frac{dl}{dt} = r \frac{d\theta}{dt}$$

$$v = r\omega$$

linear velocity angular velocity.

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(b) $v = \frac{\omega}{R}$

(c) $v = \frac{R}{\omega}$

(d) $v = \omega^2 R$

Answer: (A)

A body in rotational motion possesses rotational kinetic energy given by

-----.

a. $KE = \frac{1}{2} I^2 \omega$

b. $KE = \frac{1}{2} I \omega^2$

c. $KE = 2I^2 \omega$

d. $KE = I \omega$

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c. $KE = 2I^2 \omega$

d. $KE = I \omega$

Answer: (B)

Rotational kinetic energy of a solid cylinder rotating about its axis is:

(a) $\frac{1}{2}MR^2\omega^2$

(b) $\frac{1}{4}MR^2\omega^2$

(c) $\frac{1}{3}MR^2\omega^2$

(d) $\frac{1}{2}I\omega^2$

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(c) $\frac{1}{3}MR^2\omega^2$

(d) $\frac{1}{2}I\omega^2$

Answer: (D)

A solid disc and a solid sphere have the same mass and same radius. Which one has the higher moment of inertia about its centre of mass ?

- (a) The disc
- (b) The sphere
- (c) Both have the same moment of inertia
- (d) The information provided is not sufficient to answer the question

A solid disc and a solid sphere have the same mass and same radius. Which one has the higher moment of inertia about its centre of mass ?

- (a) The disc
- (b) The sphere
- (c) Both have the same moment of inertia
- (d) The information provided is not sufficient to answer the question

Answer : D

A thin disc and a thin ring, both have mass M and radius R . Both rotate about axes through their center of mass and are perpendicular to their surfaces at the same angular velocity. Which of the following is true ?

- (a) The ring has higher kinetic energy
- (b) The disc has higher kinetic energy
- (c) The ring and the disc have the same kinetic energy
- (d) Kinetic energies of both the bodies are zero since they are not in linear motion

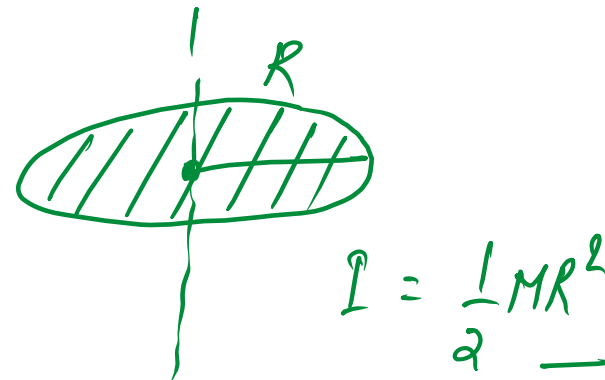
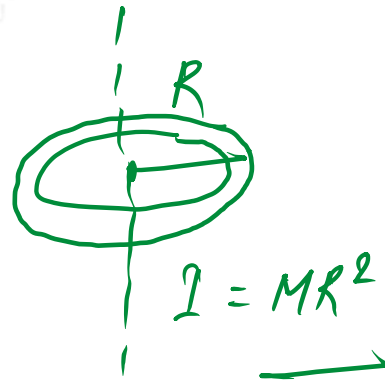
$$K = \frac{1}{2} I \omega^2$$

moment of inertia

Higher $I \Rightarrow$ Higher kinetic energy (K)

$$I_{\text{ring}} = MR^2$$

$$I_{\text{disc}} = \frac{1}{2} MR^2$$



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Answer : A

For which of the following does the centre of mass lie outside the body ?

- (a) A pencil
- (b) A shotput
- (c) A dice
- (d) A bangle

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When A Torque Acting On A System Is Zero, Then Which Of The Following Should Not Change?

- (a) Linear velocity
- (b) Angular momentum
- (c) Angular displacement
- (d) Force acting on the body

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Two rings have their moments of inertia in the ratio 2 : 1 and their diameters are in the ratio 2 : 1. The ratio of their masses will be

- (a) 2 : 1
- (b) 1 : 2
- (c) 1 : 4
- (d) 1 : 1

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(c) 1 : 4

(d) 1 : 1

Angular acceleration is produced in a body when a acts on it.

- A. Moment of Inertia
- B. Velocity
- C. Torque
- D. None of the Above

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- A. Moment of Inertia
- B. Velocity
- C. Torque**
- D. None of the Above

Which of the following statements is correct ?

The rotational energy of a body with a given angular speed depends on its

- (a) mass only
- (b) material only
- (c) size only
- (d) mass as well as the distribution of its mass about the axis of rotation.

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The combination of rotational motion and the translational motion of a rigid body is known as _____.

- A. Frictional motion
- B. Axis motion
- C. Angular motion
- D. Rolling motion

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- B. Axis motion
- C. Angular motion
- D. Rolling motion**

Moment of inertia, of a spinning body about an axis, doesn't depend on which of the following factors?

- a) Distribution of mass around axis
- b) Orientation of axis
- c) Mass
- d) Angular velocity

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- c) Mass
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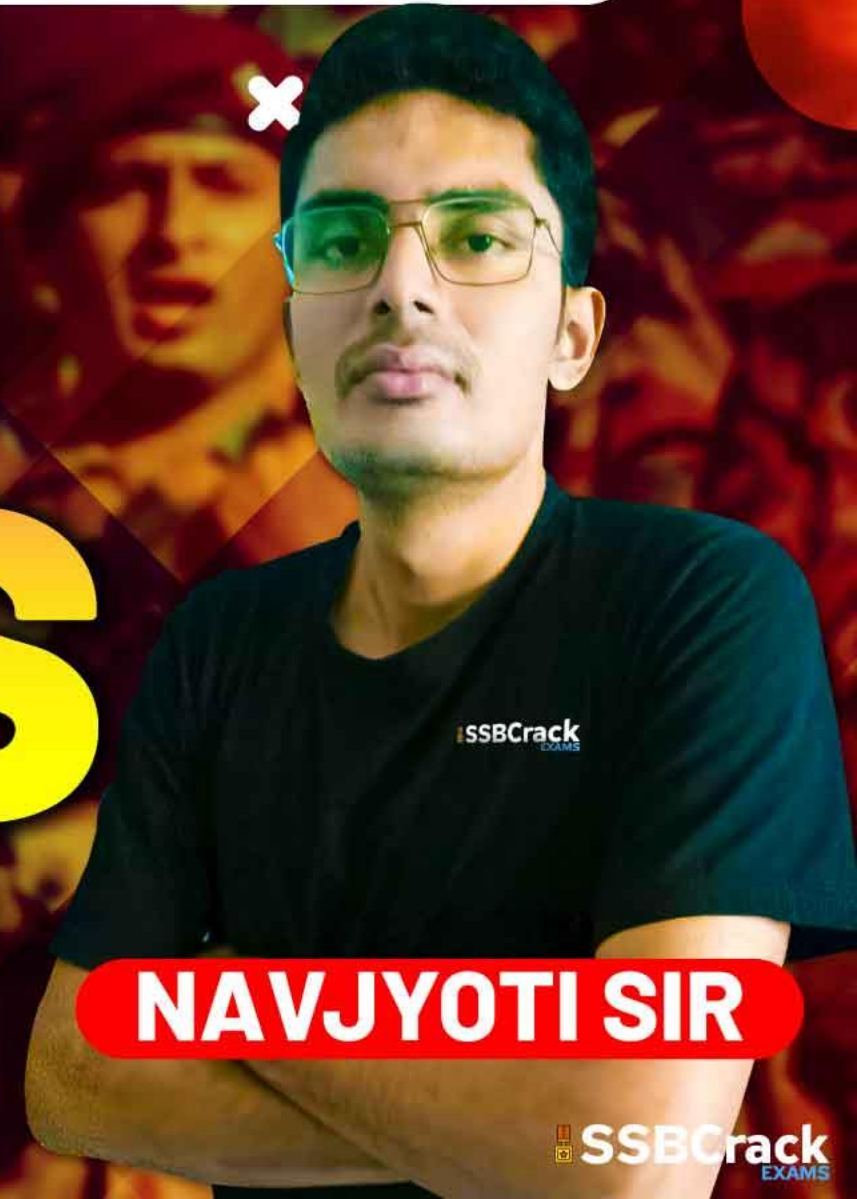
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NAVJYOTI SIR

SSBCrack
EXAMS

**REVISION
TOPICS :
(06/08/24)**

- **Reflection of Light**
- **Refraction of Light**