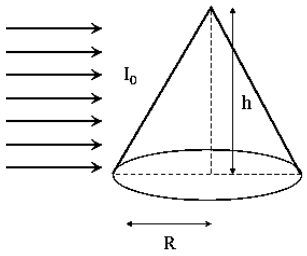
Q.1 Photoelectric emission occurs only when the incident light has more than a certain minimum -
(A) Wavelength **(B)**Intensity **(C)**Frequency **(D)**Power

Q.2 Which of the following may or may not be conserved for the photons?
(A) Energy **(B)**Momentum **(C)**Number of photons **(D)**None of these

Q.3 The particles knocked out from hot surfaces are -
(A) Protons **(B)**Electrons **(C)**Neutrons **(D)**None of these

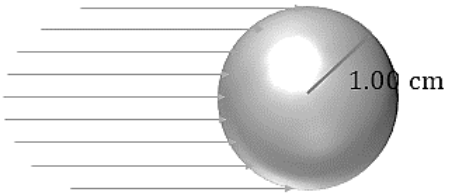
Q.4 When ultraviolet rays are incident on a metal plate, the photoelectric effect does not occur. It occurs by incidence of -
(A) Infrared rays **(B)**X-rays **(C)**Radio waves **(D)**Light waves

Q.5 The number of ejected photoelectrons increases with increase in _____ of light.
(A) Intensity **(B)**Wavelength **(C)**Frequency **(D)**None of these



Q.6 A sphere of radius $\mathbf{1.00\ cm}$ is placed in the path of a parallel beam of light of large aperture. The intensity of the light is $\mathbf{0.50\ W/cm^2}$. If the sphere partially absorbs ($\boldsymbol{\alpha = 0.25}$) the radiation falling on it, find the force exerted by the light beam on the sphere.
(A)$\frac{\pi R^2 I_0}{c}$ **(B)**$\frac{\pi R h I_0}{c}$ **(C)**$\frac{\pi R h I_0}{c}$ **(D)**$\frac{R h I_0}{c}$

Q.7 A sphere of radius $\mathbf{1.00\ cm}$ is placed in the path of a parallel beam of light of large aperture. The intensity of the light is $\mathbf{0.50\ W/cm^2}$. If the sphere partially absorbs ($\boldsymbol{\alpha = 0.25}$) the radiation falling on it, find the force exerted by the light beam on the sphere.
(A)8.5×10^{-7} N **(B)**5.2×10^{-7} N **(C)**9.16×10^{-9} N **(D)**9.3×10^{-7} N



Q.8 A small laser emits light at power $\mathbf{5\ mW}$ and wavelength $\mathbf{633\ nm}$. The laser beam is focused (narrowed) until its diameter matches the $\mathbf{1266\ nm}$ diameter of a sphere placed in its path. The sphere is perfectly absorbing and has density $\mathbf{5 \times 10^3\ kg/m^3}$. What is the magnitude of the acceleration that force alone would give the sphere?
(A)300 m/s^2 **(B)**3434 m/s^2 **(C)**3344 m/s^2 **(D)**3144 m/s^2

Q.9 A **100 W** light bulb is placed at the center of a spherical chamber of radius **20 cm**. Assume that **60**% of the energy supplied to the bulb is converted into light and the surface of the chamber is partially reflecting. Find the absorption coefficient of the chamber, if pressure exerted by the light on the surface of the chamber is $\mathbf{4.4 \times 10^{-7}\ N/m^2}$.

(A) 0.1 **(B)** 0.2 **(C)** 0.8 **(D)** 0.9

Q.10 A partially reflecting surface (Solid hemisphere) of radius **R** placed in the path of a parallel beam of light of large aperture. If the beam carries an intensity **I** and reflectivity is **0.75**, The force exerted by the beam on the hemisphere is

(A) $\frac{I\pi R^2}{c^2}(1.75)$ **(B)** $\frac{I\pi R^2}{c}(1.75)$ **(C)** Zero **(D)** $\frac{I\pi R^2}{c}(0.25)$

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(C)	(C)	(B)	(B)	(A)	(D)	(C)	(D)	(D)	(B)