Physics MCQ Sample Question

Question Content	Category	Correct	Option 1	Option 2	Option 3	Option 4
A distance ‘t’ travelled by light in a medium of refractive index μ is equivalent to an optical path of	Chapter1	μt	μt	t/μ	(μ-1) t	t/(μ-1)
In a wedge shaped film with an angle of wedge α, the fringe width is given by	Chapter1	λ / (2 μ sin α)	λ sin α / (2 μ)	λ / (2 μ sin α)	μ λ/(2 sin α)	2 μ λ/sin α
Path difference of 2λ/3 corresponds to a phase difference of	Chapter1	2π/3	2π/3	π/3	π	4π/3
When light traveling in air gets reflected from water surface, there is	Chapter1	Phase change of π	No phase change	Phase change of π/2	Phase change of π/4	Phase change of π
An excessively thin film illuminated by white light appears ___________in the reflected light.	Chapter1	Dark	Uniformly bright	Colored	Dark	none of above
If the angle of a wedge shaped film is decreased, the fringe width__________	Chapter1	Increases	Increases	Decreases	Remains same	First increases then decreases
A non reflecting film removes the reflected light by	Chapter1	Destructive interference by the film	Absorption by the film	Transmission by the film	Destructive interference by the film	none of the above
In non reflection film coating , the thickness of coating depends on	Chapter1	Wavelength and refractive index of coating	Wavelength only	Refractive index only	Wavelength and refractive index of coating	Wavelength and refractive index of glass
In Newton’s ring experiment if white source of light is used then outermost ring have the color	Chapter1	Red	Violet	Red	Blue	Yellow

When a monochromatic light is incident normally on a thin film (with air on both sides) then the film will appear bright for thickness	Chapter2	$\lambda/4\mu$	$\lambda/4\mu$	$\lambda/3\mu$	$\lambda/2\mu$	$\lambda/2\mu$
In Fresnel diffraction, the wavefront incident on the slit is	Chapter2	Spherical	Spherical	Cylindrical	Either spherical or cylindrical	Plane
Diffraction of light establishes its __________ nature	Chapter2	Wave	Particle	Wave	Dual	Mix
In fraunhofer diffraction at a single slit, the minimum intensities are formed at angles given by $\sin^{-1}$	Chapter2	$n\lambda /a$	$n\lambda /a$	$a/n\lambda$	$\pi/2 - n\lambda/a$	$a\lambda/n$
In Fraunhofer diffraction at a single slit, the resultant intensity at an angle θ with the incident direction is	Chapter2	I_θ= Imax $(\sin\alpha / \alpha)^2$	$I_\theta = I_{max} (\sin\alpha/\alpha)$	I_θ= Imax $(\sin2\alpha/\alpha)$	I_θ = Imax $(\sin\alpha / \alpha)^2$	I_θ= Imax $(\alpha/\sin \alpha)$
The condition for minimum intensity in diffraction grating is	Chapter2	$(a + b) \sin\theta =(n / N) \lambda$	$a\sin\theta= n\lambda$	$(a+b)\sin\theta = n\lambda$	$a\sin\theta = (n+1/2)\lambda$	$(a + b) \sin\theta =(n / N) \lambda$
If N is the total number of lines on the grating, the intensity of principal maximum is_____ times the intensity of single slit	Chapter2	N^2	N	N^2	2N	N/2
In Fraunhofer diffraction at a diffraction grating, as width of a line is decreased, the adjacent principal maxima_________	Chapter2	Move apart	Come closer	Move apart	Remain at fixed position	Initially increased then decreases
The sky appears blue as	Chapter2	Scattering of blue is maximum	Refraction of red is minimum	Scattering of red is maximum	Refraction of blue is maximum	Scattering of blue is maximum

Which of the following statements does not apply to Fraunhofer's diffraction	Chapter2	A pair of concave lenses are used to observe the diffraction pattern	It is also called far field diffraction	The wavefronts incident on obstacle and screen are plane wavefronts	The diffraction pattern is insensitive to distance	A pair of concave lenses are used to observe the diffraction pattern
What is the highest order of the spectrum that is visible with a light of wavelength 6000A° by means of a grating having 5000 lines per cm	Chapter2	3	2	3	4	5
A slit of variable width is illuminated by a red light of λ = 6500A°. At what width of the slit, the first minimum will fall at θ = 30°	Chapter2	1.3×10^{-4} cm	6.5×10^{-4} cm	1.3×10^{-3} cm	1.3×10^{-4} cm	6.5×10^{-3} cm
If a is the slit width and θ is the angle of diffraction in Fraunhofer diffraction at a single slit, the phase difference between extreme rays from the slit is	Chapter2	$(2\pi / \lambda) a\sin\theta$	$a\sin\theta$	$a\cos\theta$	$(2\pi / \lambda) a\sin\theta$	$(2\pi/\lambda)a\cos\theta$
Light enters the geometrical shadow of slit in ____________ diffraction	Chapter2	Both Fresnel and Fraunhofer	Fresnel	Fraunhofer	Both Fresnel and Fraunhofer	none of above
How shall a diffraction pattern change whem white light is used instead of a monochromatic light?	Chapter2	The colored pattern will be observed with a bright fringe at the center	The pattern will no longer will be visible	The shape of the pattern will change from hyperbolic to circular	The colored pattern will be observed with a bright fringe at the center	The bright and dark fringes will change position
If a is width of each slit, b is width of each opaque space and W is the width of diffraction grating, the total number of lines is	Chapter2	W /(a + b)	1/(a+b)	W /(a + b)	W(a+b)	a+b

When light is incident at Brewster angle	Chapter3	The reflected light is plane polarised	The reflected light is plane polarised	The reflected light is partially plane polarised	The reflected is light circularly polarised	none of the above
If μ_o and μ_e , are the refractive indices of a negative uniaxial crystal for O-ray and E-ray, then the correct statement for μo and μe is	Chapter3	$\mu_o>\mu_e$	$\mu_o>\mu_e$	$\mu_o<\mu_e$	$\mu_o = \mu_e$	none of the above
Polaroid sun glasses decrease the glare on a sunny day because they	Chapter3	Block a portion of sunlight	Block a portion of sunlight	Have a special colour	Completely absorb the sunlight	Refract the light
Light transmitted by Nicol prism is	Chapter3	Plane polarized	Unpolarized	Plane polarized	Circularly polarized	Elliptically polarized
The phenomenon of polarisation takes place in	Chapter3	Transverse waves only	Longitudinal waves only	Transverse waves only	Both longitudinal and transverse waves	Neither longitudinal nor transverse waves
Liquid crystal display is an example of following effect	Chapter3	Polarization	Diffraction	Interference	Polarization	Light emitting diode
The phase difference produced between the O-ray and the E-ray by a half wave plate is	Chapter3	π	$\pi/2$	$\pi/4$	$\pi/8$	π
Unpolarised light can be converted into a partially polarised or plane polarised by several processes Which of the following does not do that?	Chapter3	diffraction	reflection	diffraction	double refraction	scattering

The intensity of the polarised light transmitted through the analyser varies as the	Chapter3	Square of the cosine of the angle between the planes of transmission of polarizer	Square of the cosine of the angle between the planes of transmission of polarizer	Square of the sine of the angle between the planes of transmission of polariser and analyser	Tangent of the angle between the planes of transmission of polarizer and analyser	Square of tangent of the angle between the planes of transmission of polarizer and analyser
For a particular angle of diffraction in single slit Fraunhofer diffraction, the phase difference between extreme rays is 2π. At this angle of diffraction __________is formed	Chapter3	minimum	principle maximum	secondary maximum	minimum	intermediate pattern
The thickness of a quarter wave plate made of quartz for wavelength 5000 A° and refractive index μ_e = 1.553 and μ_o = 1.543, is	Chapter3	1.25 x 10^{-3} cm	500 x 10^{-3} cm	3.75 x 10^{-3} cm	7.5 x 10^{-3} cm	1.25 x 10^{-3} cm
What happens to O-ray and E-ray, if they travel along the optic axis?	Chapter3	Both ray travel with same velocity	Both ray travel with same velocity	O-ray travels faster than E-ray	E-ray travels faster than O-ray	none of the above
The explanation of double refraction in uniaxial crystals was proposed by	Chapter3	Huygens	Brewster	Fresnel	Malus	Huygens
Polarization of light proves the	Chapter3	Transverse nature of light	Corpuscular nature of light	Quantum nature of light	Transverse nature of light	Longitudinal nature of light
Acronym of LASER is	Chapter4	Light Amplification by Stimulated Emission of Radiation	Light Amplification by Stimulated Emerging of Radiation	Light Amplification by Stimulated Emission of Radiation	light amplification by the synchronous emission of radiation	Light Amplification by Spontaneous Emission of Radiation

For laser action which of the following condition should be required	Chapter4	All of the above	More number of atoms in metastable state than in ground state	Metastable state (state with relatively longer life time)	Enough number of photons in the system	All of the above
Lifetime of ordinary excited state and metastable state is	Chapter4	10^{-8} s, 10^{-3} s	10^{-8} s, 10^{-3} s	10^{-8} s, 10^{-12} s	10^{-3} s, 10^{-12} s	10^{-8} s, 10^{-8} s
Is Laser is polarised?	Chapter4	Yes and monochromatic beam	No but multidirectional beam	Yes and monochromatic beam	Not polarised but monochromatic beam	Yes but it is multidirectional beam
Length of the Laser cavity is	Chapter4	n(λ/2)	(λ/3)	n(λ/2)	λ	None of the above
Holography is a technique of producing	Chapter4	Three dimensional real images and photographs	One dimensional real images and photographs	Two dimensional real images and photographs	Three dimensional real images and photographs	None of the above
How is population inversion achieved in a He–Ne laser?	Chapter4	Electrical Pumping	Optical Pumping	Electrical Pumping	Chemical Pumping	X-ray Pumping
Which of the following is the role of a resonant cavity in a laser system	Chapter4	All of the above	Enhances the photons in laser having wavelength λ	It supports positive feedback	It provides directionality to the laser	All of the above
Helium–Neon laser is a	Chapter4	Four level laser	Four level laser	Five level laser	Two level laser	Three level laser
Which of the following is a unique property of laser?	Chapter4	coherent	Coherent	Double frequency	photons	Refraction
Laser is emitted during	Chapter4	Stimulated Emission	Spontaneous Absorption	Spontaneous Emission	Stimulated Absorption	Stimulated Emission

In semiconductor Laser P-N junctions are	Chapter4	Heavily doped and operated with large forward current	Lightly doped and operated with large forward current	Heavily doped and operated with large forward current	Heavily doped and operated with large reverse current	Lightly doped and operated with large reverse current
Why laser action needs to achieve population inversion?	Chapter4	To excite most of the atoms to metastable state	To deexcite most of the atoms to ground state	To achieve equilibrium condition	To decrease the number of atoms in excited state	To excite most of the atoms to metastable state
Holography	Chapter4	Records information about the amplitude as well as phase of the object beam	Records information of only amplitude of the object beam	Records information about the amplitude as well as phase of the object beam	Records information of only Phase of the object beam	Records only virtual image of the object
Hologram construction (recording) process involves	Chapter4	Interference	Difraction	Reflection	Interference	Polarisation
Hologram behaves like a	Chapter4	Diffraction grating	Polariser	Diffraction grating	Mirror	Interferometer s
If hologram is broken in to pieces, the entire information	Chapter4	Can be retrieved from a single broken piece	Can be retrieved from a single broken piece	Can't be retrieved from a single broken piece	Retrieving depends on the size of the broken piece	None of the above
Which of the following is not a characteristic of LASERS?	Chapter4	Divergent	Monochromati c	Coherent	Divergent	Polarised
In semiconductor diode Laser Pumping is done with	Chapter4	Forward bias	Forward bias	Zero bias	Reverse bias	None of the above

In He-Ne laser, Laser is emitted during	Chapter4	De-excitation of Ne atom	Excitation of Ne atom	De-excitation of Ne atom	Excitation of He atom	De-excitation of He atom
What type of laser is used in CD and DVD players?	Chapter4	Semiconducto r	Ruby Laser	He-Ne Laser	Semiconducto r	CO_2 Laser
He Ne laser is a	Chapter4	Continuous laser	Continuous laser	Micro second Laser	Nano second Laser	Femto second Laser
Helium–neon lasers generate light in the	Chapter4	Red part of the spectrum	Violet part of the spectrum	Green part of the spectrum	Yellow part of the spectrum	Red part of the spectrum
A semiconductor diode Laser is	Chapter4	Two level laser	Four level laser	Five level laser	Two level laser	Three level laser
The ratio of He to Ne in He-Ne laser is	Chapter4	85% : 15%	75% : 25%	60% : 40%	85% : 15%	50% : 50%
The role of He in He-Ne laser is	Chapter4	He atoms help in exciting Ne atoms	He is an active medium	Population inversion takes place in He	Stimulated emission takes place in He	He atoms help in exciting Ne atoms
Hologram is the result of	Chapter4	Interference of object and reference beam	Refraction of object and reference beam	Polarization of object and reference beam	Interference of object and reference beam	Diffraction of object and reference beam
Two waves are said to be coherent	Chapter4	If they have zero or constant phase difference between them	If they have infinite phase difference between them	If they have zero or constant phase difference between them	If they have variable phase difference between them	If they have phase difference between them
The state of population inversion is also called as	Chapter4	Negative temperature state	Negative temperature state	Positive temperature state	Zero temperature state	Not related to any temperature state

An atomic or molecular system with metastable state and having population inversion is called as	Chapter4	Active system	Active system	Resonant cavity	Laser set up	Holograms
The principle that all microscopic physical entities have both wave and particle properties is called the wave-particle:	Chapter5	Duality	Triality	Duality	Singularity	Infinality
In the probabistic interpretation of wave function ψ, the quantity $\|\psi\|^2$ is:	Chapter5	A probability density	A probability density	A probability amplitude	1	A negative probability
The concept of matter wave was suggested by__________	Chapter5	de Broglie	Heisenberg	de Broglie	Schrodinger	Laplace
The total probability of finding the particle in space must be ___________	Chapter5	Unity	zero	Unity	Infinity	Double
The normalized wave function must have _________ norm	Chapter5	Finite	zero	Infinite	Finite	Complex
The operator ∇^2 is called ________ operator	Chapter5	Laplacian	Hamiltonian	Laplacian	Poisson	vector
Schrodinger's equation described the______	Chapter5	wave nature of material particles	particle nature of material particles	wave nature of material particles	wave and particle nature of material particles	None of the above
The speed of propagation of an electromagnetic wave in vacuum is:	Chapter5	3×10^8 m/s	3×10^6 m/s	3×10^8 m/s	3×10^8 km/s	3×10^6 km/s
The expression of the momentum of a photon is :	Chapter5	$p = h / \lambda$	$p = h \lambda$	$p = h / \lambda$	$p = c / \lambda$	$p = c \lambda$
Express in eV, the energy of a photon of wavelength λ= 634 nm:	Chapter5	1.95 eV	195 eV	0.195 eV	1.95 eV	19.5 eV
Express in nm, the wavelength of a photon of energy equal to 1 keV:	Chapter5	1.24 nm	0.124 nm	1.24 nm	12.4 nm	124 nm
The wavelenth associated with an electron of energy E = 100 eV is equal to :	Chapter5	12.3 nm	0.123 nm	12.3 nm	1.23 nm	123 nm
The wavelength associated with a 2 g ball with a velocity of 100 m/s is equal to:	Chapter5	3.31×10^{-33} m	3.31×10^{-33} m	0.331×10^{-36} m	3.31×10^{-38} m	33.1×10^{-33} m
If the uncertainty of a proton accelerated in a laboratory is 400 m/s, that of its position is:	Chapter5	7.88 nm	9.88 nm	78.8 nm	98.8 nm	7.88 nm

The de-Broglie hypothesis is associated with:	Chapter5	Wave nature of all material particles	Wave nature of electrons only	Wave nature of alpha-particles only	Wave nature of all material particles	Wave nature of radiations
Which of the following phenomena provides the best evidence that light can have particle properties?	Chapter5	Compton scattering	Diffraction of light	Compton scattering	Electron diffraction	γ-ray diffraction
Newton's rings Formation is due to	Chapter5	Interference	Interference	Difraction	Polarization	Reflection
Which of the following formulas can be used to determine the de Broglie wavelength?	Chapter5	$\lambda = h/mv$	$\lambda = mc/h$	$\lambda = mv/h$	$\lambda = hmv$	$\lambda = h/mv$
The electron microscope's main advantage over the optical microscope is which of the following?	Chapter5	Higher resolution possible	Greater ease of portability	Dispenses with need for a lens	Higher power lens used	Higher resolution possible
The de Broglie wavelength λ of a particle ________	Chapter5	is inversely proportional to impulse	is inversely proportional to impulse	is proportional to mass	is proportional to impulse	does not depend on impulse
That light has a dual nature is referring to light______	Chapter5	Acting as waves and particles.	Having high- or low-energy photons.	Acting as waves and particles.	Having energy and momentum	Undergoing pair production.
De Broglie equation______	Chapter5	Relates the momentum of a mass to its wavelength	Relates the momentum of a mass to its wavelength	Relates the energy of a mass to its wavelength	Relates the frequency of a mass to its wavelength	Relates the work function of a mass to its wavelength
All electromagnetic waves______	Chapter5	All of the above	Travel at the speed of light	Can exhibit interference	Can be reflected	All of the above
Schrodinger's equation described the______	Chapter6	Behavior of "matter" waves	Procedure for splitting an atom	Behavior of "matter" waves	Complement of the wave function	Motion of light
Solutions to Schrodinger's equation are labeled with________	Chapter6	Ψ	Ψ	ϕ	μ	π

The probability density is the________	Chapter6	Absolute square of the wave function	Square root of the wave function	Absolute square of the wave function	Absolute value of the wave function	Inverse of the wave function
Which two characteristics are variables in Heisenberg's uncertainty principle?	Chapter6	Position and momentum	Wavelength and distance	Position and momentum	Charge and displacement	Atomic radius and frequency
Atoms do not emit and absorb light continuously but do it in little chunks. Each chunk is called______	Chapter6	Quantam	Protons	Quantam	Electrons	Wave
The branch of physics that is the general study of the micro-world of photons, atoms, and nuclei is called ________	Chapter6	Quantum physics	Classical physics	Quantum physics	Nuclear physics	Solid-state physics
In an infinitely rigid box, potential energy inside the box is	Chapter6	Zero	One	very small	Infinite	Zero
In wave mechanics particles can tunnel through classically forbidden region	Chapter6	TRUE	TRUE	FALSE	Partly true	None of the above
The energy of a bounded particle is always quantized, but a free particle can access____	Chapter6	Any energy	Twice energy	Any energy	Infinite energy	Single energy
The entire energy of a particle in rigid box is _________ energy	Chapter6	Kinetic	Kinetic	Kinetic + potential	Infinite	Potential
A subatomic particle’s behavior is governed by _______ laws	Chapter6	Quantum	Classical	Newton’s	Quantum	None of the above
Consider nucleus as a rigid box having width ~10^{-14} m, calculate the ground state energy of electron	Chapter6	3774 MeV	3774 MeV	3774 eV	3774 KeV	3.774 eV
Calculate the quantum number associated with a cricket ball of mass 163 g moving on a ground having size 138 m with speed 160 km/h.	Chapter6	3×10^{36}	3×10^{33}	3×10^{34}	3×10^{36}	3×10^{30}
In a non-rigid box, the potential energy of the particle inside the box is_________	Chapter6	Zero	One	Equal to the outside energy of the box	Infinite	Zero

In a non-rigid box, the motion of the particle is__________	Chapter6	One dimensional	Two dimensional	Three dimensional	One dimensional	Zero dimensional
In a rigid box, the limit of Region-I is______	Chapter6	$-\infty<x<0$ and $V=\infty$	$L<x<+\infty$ and $V=0$	$-\infty<x<0$ and $V=\infty$	$0<x<L$ and $V=0$	$\infty<x<0$ and $V=V_0$
In a rigid box, the limit of Region-II is______	Chapter6	$0<x<L$ and $V=0$	$L<x<+\infty$ and $V=V_0$	$-\infty<x<0$ and $V=V_0$	$0<x<L$ and $V=0$	$\infty<x<0$ and $V=V_0$
In a rigid box, the limit of Region-III is______	Chapter6	$L<x<+\infty$ and $V=\infty$	$L<x<+\infty$ and $V=\infty$	$-\infty<x<0$ and $V=V_0$	$0<x<L$ and $V=0$	$\infty<x<0$ and $V=V_0$
The wavelengths of the De Broglie waves in finite potential well are ______the wavelengths of the De Broglie waves in infinite potential well.	Chapter6	Longer than	Longer than	Shorter than	Equal to	Half of
Which equation governs the time evolution of quantum mechanical systems in the non-relativistic approximation?	Chapter6	Schrodinger's equation	Maxwell's equation	Einstein's field equations of general relativity	Schrodinger's equation	Dirac's equation
_______ quantum mechanical entities (with some exceptions) must be -Single-valued (and their derivatives too), finite (and their derivatives too), continuous (and their derivatives too), normalizable or square-integrable.	Chapter6	Wave functions	Wavelengths	Wavepackets	Wavenumbers	Wave functions
In an infinite potential well during collisions with walls,electrons	Chapter6	looses no energy	looses no energy	looses energy	looses finite energy	none of the above
Calculate the wavelengths of photons of energy 1 eV.	Chapter6	12431 A°	12.431 A°	12431 A°	124.31 A°	1.2431 A°
Calculate the De Broglie wavelengths of 1 keV electron.	Chapter6	0.388 A°	388 A°	3.88 A°	0.388 A°	38.8 A°
If electrons are accelerated at 100 kV, their De Broglie wavelength becomes _______	Chapter6	0.039 A°	0.39 A°	0.0039 A°	0.00039 A°	0.039 A°
Which of the following is not a variable in the de Broglie euqation?	Chapter6	Location	Wavelength	Location	velocity dependent	Plank's Constant

Calculate the wavelengths of photons of energy 1 MeV.	Chapter6	0.12431 A°	0.12431 A°	12431 A°	1.2431 A°	12.431 A°
In solids there is significant interaction between ………. electrons of different atoms.	Chapter7	Outermost	Innermost	Free	Outermost	All the above
An energy band is …………	Chapter7	A set of closely spaced allowed energy levels	A set of continuous energies	A set of closely spaced allowed energy levels	A set of widely spaced allowed energy levels	none of the above
Valence band of a semiconductor at 0 K will be ……………..	Chapter7	Completely filled	Completely filled	Partially filled	Completely empty	Either completely filled or completely empty
In intrinsic semiconductors, number of free electrons is ___________ number of holes at oK.	Chapter7	Equal to	Equal to	Greater than	Less than	Can not define
When N-type semiconductor is heated,	Chapter7	Number of electron and holes increases equally	Number of free electrons increases while that of holes decreases	Number of holes increases while that of electrons decreases	Number of electrons and holes remain same	Number of electron and holes increases equally

A piece of copper and germanium are cooled from the room temperature to 80K, then	Chapter7	The resistance of copper will decrease while that of germanium will increase	Resistance of each will increase	Resistance of copper will decrease	The resistance of copper will increase while that of germanium will decrease	The resistance of copper will decrease while that of germanium will increase
The intrinsic semiconductor becomes an insulator at	Chapter7	0K	0°C	0K	300K	—100°C
Choose the only false statement from the following	Chapter7	The resistivity of a semiconductor increases with increase in temperature.	In conductors the valence and conduction bands may overlap.	Substances with energy gap of the order of 5 eV are insulators.	The resistivity of a semiconductor increases with increase in temperature.	The conductivity of a semiconductor increases with increase in temperature
What is the conductivity of semiconductor if free electron density = $5\text{x}10^{12}/cm^3$ and hole density = $8\text{x}10^{13}/cm^3$? [μ_e = 2.3 and μ_h = 0.01 in SI units]	Chapter7	1.968	5.634	1.968	3.421	8.964
The temperature coefficient of the resistance of semiconductors is always	Chapter7	Negative	Positive	Negative	Zero	Infinite

If the drift velocity of holes under a field gradient of 100 V/m is 5m/s, the mobility (in the same SI units)is ………	Chapter7	0.05	0.05	0.55	500	None of the above
Unit for electric field strength is	Chapter7	V/cm	A/cm^2	mho/meter	$cm^2/V.s$	V/cm
Flow of electrons is affected by the following	Chapter7	All	Thermal vibrations	Impurity atoms	Crystal defects	All
Mobility of holes is ___________ mobility of electrons in intrinsic semiconductors	Chapter7	Less than	Equal to	Greater than	Less than	Cannot define
The mobility is given by (notations have their usual meaning):	Chapter7	$\mu = v_0/E_0$	$\mu = v_0/E_0$	$\mu = v_0/E_0^2$	$\mu = v_0^2/E_0$	None of the above
If the band gap energy of a semiconductor is Eg ,the material will be ………	Chapter7	Transparent to wavelength greater than hc/Eg	Transparent to wavelength greater than hc/Eg	Opaque to wavelength greater than hc/Eg	Transparent to wavelength less than hc/Eg	None of the above
The equation for current is I =	Chapter7	neV_dA	neV_dA	neV_d	nV_dA	none of the above
If an electric field of 10 V / m is applied to n-type Germanium in which the mobility of free electrons is 3800 cm^2 / V-s, the drift velocity of electrons will be …………. m/s.	Chapter7	3.8	38000	38	3.8	0.38

The value of Fermi Function at 0K for E < E_F is …………	Chapter7	1	0	1	0.5	0.75
Fermi energy level for intrinsic semiconductors lies	Chapter7	At middle of the band gap	At middle of the band gap	Close to conduction band	Close to valence band	None
Fermi energy level for p-type extrinsic semiconductors lies	Chapter7	Close to valence band	At middle of the band gap	Close to conduction band	Close to valence band	None
Fermi level for extrinsic semiconductor depends on	Chapter7	All	Donor element	Impurity concentration	Temperature	All
In a n-type semiconductor, the Fermi level at 0K is ……	Chapter7	Between donor level and conduction band	Between valence band and acceptor levels	Between acceptor levels and intrinsic Fermi level	Between intrinsic Fermi level and donor level	Between donor level and conduction band
The Fermi level shifts ………… in n-type semiconductor with increase in temperature	Chapter7	Downwards	Upwards	Downwards	Neither upward nor downward	none of the above
In an unbiased p-n junction	Chapter7	The n side is at higher electrical potential than the p side	The potential of the p and n sides becomes higher alternately	The p side is at higher electrical potential than the n side	The n side is at higher electrical potential than the p side	Both the p and n sides are at the same potential

When reverse bias is applied to a p-n junction diode, the Fermi level in n-type .... with respect to the Fermi level in p-type.	Chapter7	Falls	Rises	Falls	Remains at the same level	Initially rises and then falls
If V_B is the barrier potential, the energy difference between the conduction bands of n-type and p-type in open circuited p-n junction diode is	Chapter7	eV_B	eV_B	V_B/e	$e+V_B$	$E-V_B$
Under equilibrium conditions in a p-n junction, the Fermi level in n-type is at .... level than/as that in p-type.	Chapter7	Same	Higher	Lower	Same	none of the above
In an n-p-n transistor, ...electrons from emitter get neutralized in base.	Chapter7	Very few	A large number of	Very few	All	None of the
The part of a transistor, which is heavily doped to produce large number of majority carriers, is	Chapter7	Emitter	Emitter	Base	Collector	Any of the above depending upon the nature of transistor
In Hall effect, the magnetic field is applied	Chapter7	Perpendicular to direction of current	In the direction of current	Opposite to direction of current	Either in or opposite to direction of current	Perpendicular to direction of current
When the load resistance connected across the solar cell is infinite, we get	Chapter7	Open circuit voltage	Open circuit current	Open circuit voltage	Short circuit current	Short circuit voltage
If the Hall coefficient of a material is 1.25 X 10^{-11} m^3 / C and charge of an electron is 1.6 X 10^{-19} C, the density of electron is .... per m^3.	Chapter7	5×10^{29}	2×10^{29}	4×10^{29}	5×10^{29}	2×10^{2}

The generation of an e.m.f. across an open circuited p-n junction when light is made incident on it is known as ……………..effect.	Chapter7	Photovoltaic	Photoemissive	Photoconductive	Photovoltaic	none of the above
The output from a solar cell is ……	Chapter7	d.c.	a.c.	d.c.	can be either a.c. or d.c.	none of the above
Which of the following is simplest method used to make carbon nanotube,fullerens etc.	Chapter8	Chemical vapour deposition	Chemical vapour deposition	Sol-gel technique	Plasma arching	Mechanical method
Which of the following is used to modify the optical properties of a material system?	Chapter8	Light	Electricity	Magnetic field	Pressure	Light
Nanostructures have sizes in between:	Chapter8	1 and 100 nm	1 and 100 Å	1 and 100 nm	100 and 1000 nm	None of the above
As particles size is reduced in semiconductor nanoparticles there is ………… shift in the optical absorption spectra.	Chapter8	Blue shift	Red shift	Blue shift	Both (a) and (b)	None of the above
In quantum dot, electron is confined in ……….. dimensions	Chapter8	one	Two	One	Three	None of the above
In quantum wire, electron is confined in ……… Dimensions	Chapter8	Two	One	Three	Two	None of the above
Nanoparticles have	Chapter8	high surface to volume ratio	high surface to volume ratio	low surface to volume ratio	medium surface to volume ratio	None of the above

Superparamagnetism is	Chapter8	zero coercivity or hysteresis	zero coercivity or hysteresis	infinite coercivity or hysteresis	finite coercivity or hysteresis	None of the above
In nanosized ferromagnetic particles, there is no hysteris loss due to presence of …….	Chapter8	Single domain	Many domains	Single domain	No domain	None of the above
In metallic nanocrystals, Young's modulas ……… with decrease in particle size	Chapter8	Decreases	Remains constant	Decreases	Increases	None of the above
In Planetary ball mill method the mass ratio of balls to materials should be	Chapter8	2:1	01:02	1:4	4:1	2:1
The nanoparticles are prepared in the powder form using …..	Chapter8	High energy ball milling	Laser pyrolysis	High energy ball milling	Chemical vapour deposition	All
The nanosized components are used in electronics on the concept of ………..	Chapter8	Charge as well as spin transport of electron	Charge as well as spin transport of electron	Only spin transport of electron	Only charge transport	None of the above
Couloumb blockade region appears due to	Chapter8	zero current at low bias voltage	Infinite current at low bias voltage	zero current at low bias voltage	zero current at high bias voltage	low current at low bias voltage