Physics

Group Number :	13
Group Id :	46419940
Group Maximum Duration :	60
Group Minimum Duration :	60
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	200

Physics

Section Id :	46419950

Question Number : 636 Question Id : 4641992140 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

A uniform electric field pointing in positive X direction exists in a region. Let O be the origin, A be the point on X axis at $x = +2$ cm and B be the point on Y axis at $y = +1$ cm. Then potential at the point O, A and B satisfy :

(1) $V_O > V_A$

(2) $V_O < V_A$

(3) $V_O > V_B$

(4) $V_O < V_B$

Question Number : 637 Question Id : 4641992141 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

An electric bulb rated 200 V - 100 W is connected to a 160 V power supply. The power consumed by it would be :

(1)   64 W

(2)   80 W

(3)   100 W

(4)   125 W

Question Number : 638 Question Id : 4641992142 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Which of the following particle will experience maximum magnetic force (magnitude) when projected with same velocity perpendicular to the magnetic field ?
Choose the **correct** answer from the options given below.

(1)   Electron

(2)   Proton

(3) He^+

(4) Li^{++}

Question Number : 639 Question Id : 4641992143 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

An a.c. circuit contains 4 Ω resistance wire in series with an inductance coil of reactance 3 Ω. The impedence of the circuit is :

(1)   7 Ω

(2)   5 Ω

(3)   1 Ω

(4)   4/3 Ω

Question Number : 640 Question Id : 4641992144 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

Magnetic moment due to the motion of the electron in n^{th} energy state of hydrogen atom is proportional to :

(1) n

(2) n^2

(3) n^3

(4) n^0

Question Number : 641 Question Id : 4641992145 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

Energy levels A, B, C of a certain atom corresponds to increasing value of energy $E_A < E_B < E_C$. If $\lambda_1, \lambda_2, \lambda_3$ are the wavelengths of radiation corresponding to the transitions $C \rightarrow B$, $B \rightarrow A$ and $C \rightarrow A$ respectively then :

(1) $\lambda_3 = \lambda_1 + \lambda_2$

(2) $\lambda_1 = \lambda_2 = \lambda_3$

(3) $\lambda_3^2 = \lambda_1^2 + \lambda_2^2$

(4) $\lambda_3 = \dfrac{\lambda_1 . \lambda_2}{\lambda_1 + \lambda_2}$

Question Number : 642 Question Id : 4641992146 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

An object A is charged by rubbing with an object B. In the process 10^9 electrons are transferred from A to B. Charge developed on A will be :

(Take electronic charge $e = 1.602 \times 10^{-19} C$)

(1) $10^9 C$

(2) $10^{-9} C$

(3) $1.6 \times 10^{+10} C$

(4) $1.6 \times 10^{-10} C$

Question Number : 643 Question Id : 4641992147 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

E and V respectively represent magnitudes of electrostatic field and potential inside a charged metallic shell. We have :

(1) $E = 0, V = 0$.

(2) $E = 0, V \neq 0$.

(3) $E \neq 0, V = 0$

(4) $E \neq 0, V \neq 0$

Question Number : 644 Question Id : 4641992148 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

An electron and a proton held 1 Å apart form an electric dipole. The electric dipole moment of the dipole is :

(1) $1.6 \times 10^{-29} C m$

(2) $1.6 \times 10^{-19} C m$

(3) $3.2 \times 10^{-19} C m$

(4) $3.2 \times 10^{-29} C m$

A point charge q is placed at a distance r from another point charge Q. If the distance between the charges is doubled then :
(1)   the force between the charges becomes half and the potential energy becomes one-fourth.
(2)   the force between the charges becomes one-fourth and the potential energy becomes half.
(3)   both the force between the charges and the potential energy become one-fourth.
(4)   both the force between the charges and the potential energy become half.

A conducting wire of length L, uniform area of cross-section A of a material having n free electrons per unit volume offers a resistance R to flow of current through itself. (m and e respectively denote the mass and charge of electron). If τ is mean free time of free electrons in the conductor, the correct formula for resistance R is :

(1) $R = \dfrac{mL}{e^2 nA\tau}$

(2) $R = \dfrac{mA}{e^2 nL\tau}$

(3) $R = \dfrac{m\tau}{e^2 nAL}$

(4) $R = \dfrac{e^2 nA\tau}{mL}$
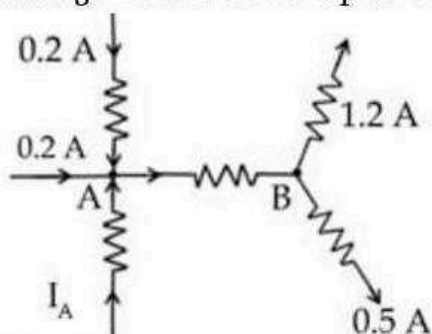
A galvanometer with resistance 100 Ohm gives full scale deflection with a current of 2 mA. The resistance required to convert galvanometer into ammeter of range 0 to 20 A is nearly :
(1) 10^{-2} Ohm in series.
(2) 10^{-2} Ohm in parallel.
(3) 10^{-1} Ohm in parallel.
(4) 10^{-1} Ohm in series.

The figure below shows a part of an electric circuit. The current marked I_A is :

(1)   1 A
(2)   1.3 A
(3)   1.7 A
(4)   3 A

A magnetic dipole aligned parallel to a uniform magnetic field requires a work of W units to rotate it through 60°. The torque exerted by the field on the dipole in this new position is :

(1) 2 W
(2) W
(3) $\sqrt{3}$ W
(4) $\dfrac{\sqrt{3}}{2}$ W

In a coil, an increase in current from 5 A to 10 A in 100 ms induces an induced emf of 100 V. The self inductance of the coil is :

(1) 2 H
(2) 10 H
(3) 20 H
(4) 2000 H

A 200 turn circular coil of area 10^3 cm^2 rotates at 60 revolutions per minute in a uniform magnetic field of 0.02 T perpendicular to the axis of rotation of the coil. The maximum voltage induced in the coil is :

(1) $\dfrac{2}{5}\,\pi$ V

(2) $\dfrac{1}{4}\,\pi$ V

(3) $\dfrac{4}{5}\,\pi$ V

(4) $\dfrac{12}{5}\,\pi$ V

In electromagnetic spectrum, v_1, v_2 and v_3 respectively denote the frequencies of microwaves, ultraviolet waves and gamma-rays. We can conclude that :

(1) $v_1 > v_2 > v_3$
(2) $v_1 < v_2 < v_3$
(3) $v_2 > v_1 > v_3$
(4) $v_3 < v_1 < v_2$

Match **Column-1** with **Column-2**.

In the table given below, certain EM waves are listed in **Column-1** and their uses in **Column-2** not necessarily in that order.

	Column-1		**Column-2**
	Electromagnetic waves		**Uses**
(A)	Microwaves	(I)	Medical diagnostic
(B)	Ultraviolet rays	(II)	Night vision
(C)	X-rays	(III)	Used in RADAR
(D)	Infra red rays	(IV)	Water purification

Choose the **correct** matching of waves and their uses from the options given below :

(1)   (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

(2)   (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

(3)   (A)-(IV), (B)-(II), (C)-(I), (D)-(III)

(4)   (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Question Number : 654 Question Id : 4641992158 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Light is incident on an interface between water ($\mu = 4/3$) and glass ($\mu = 3/2$). For total internal reflection, light should be travelling from :

(1)   water to glass and $\angle i > \angle i_c$

(2)   water to glass and $\angle i < \angle i_c$

(3)   glass to water and $\angle i < \angle i_c$

(4)   glass to water and $\angle i > \angle i_c$

Question Number : 655 Question Id : 4641992159 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Match **List-I** with **List-II** :

	List-I		**List-II**
	Optical Instrument		**Nature of Lens/mirror used**
(A)	Human eye	(I)	Concave mirror of large aperture and large focal length
(B)	Microscope	(II)	Objective lens of large aperture and large focal length
(C)	Reflecting telescope	(III)	Lens of adjustable focal length
(D)	Refracting telescope	(IV)	Objective of small aperture and small focal length

Choose the **correct** answer from the options given below :

(1)   (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

(2)   (A)-(III), (B)-(I), (C)-(II), (D)-(IV)

(3)   (A)-(III), (B)-(II), (C)-(I), (D)-(IV)

(4)   (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

Question Number : 656 Question Id : 4641992160 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

In a Young's double-slit experiment, using monochromatic light of wavelength λ, the intensity of light at a point on the screen is I_0, where path difference between two interfering waves is λ. The path difference between the interfering waves at a point where the intensity is $\dfrac{I_0}{2}$, will be :

(1) $\lambda/4$

(2) $\lambda/2$
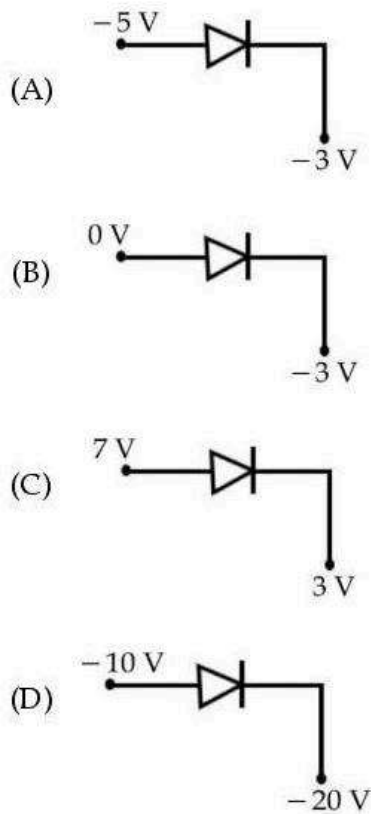
(3) λ

(4) 2λ

Question Number : 657 Question Id : 4641992161 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

A pure silicon crystal with 5×10^{28} atoms m^{-3} has $n_i = 1.5 \times 10^{16}$ m^{-3}. It is doped with a concentration of 1 in 10^5 pentavalent atoms, the number density of holes (per m^3) in the doped semiconductor will be :

(1) 4.5×10^3

(2) 4.5×10^8

(3) $\left(\dfrac{10}{3}\right)10^{12}$

(4) $\left(\dfrac{10}{3}\right)10^{7}$

Question Number : 658 Question Id : 4641992162 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

The potentials are applied to the four p-n junctions as shown below :

(A)
$-5\,V$

$-3\,V$

(B)
$0\,V$

$-3\,V$

(C)
$7\,V$

$3\,V$

(D)
$-10\,V$

$-20\,V$

The forward biased p-n junctions are :
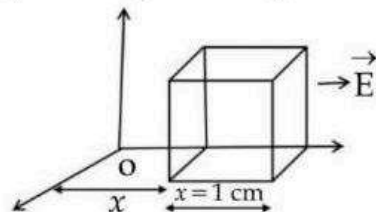
(1)   (A), (B) and (D) only

(2)   (A), (B) and (C) only

(3)   (B), (C) and (D) only

(4)   (A), (C) and (D) only

Question Number : 659 Question Id : 4641992163 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

For the given diagram $E = \phi x$ N/C, the net flux through the cube of side $x = 1$ cm, placed $x = 1$ cm from the origin as shown is :
(E is acting towards positive x-axis and $\phi = 1$)

$$\vec{E}$$

O

x $x = 1$ cm

(1) 2×10^{-6} Wb

(2) 1×10^{-6} Wb

(3) 3×10^{-6} Wb

(4) 4×10^{-6} Wb

Correct Marks : 5 Wrong Marks : 1

Arrange the following materials in the increasing order of their resistivity.

(A)   Copper
(B)   Platinum
(C)   Silver
(D)   Aluminium

Choose the **correct** sequence from the options given below :

(1)   (A), (C), (B), (D)
(2)   (C), (A), (D), (B)
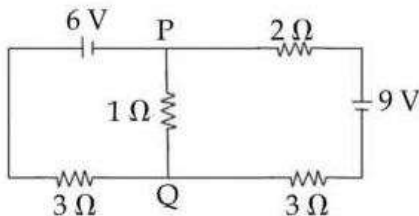(3)   (C), (B), (A), (D)
(4)   (B), (D), (A), (C)

Correct Marks : 5 Wrong Marks : 1

For the given equation of charge $Q = 3t^2 + 6t$, where Q is in coulomb and t is time in sec, the initial value of current is :

(1)   0 A
(2)   2 A
(3)   6 A
(4)   9 A

Correct Marks : 5 Wrong Marks : 1

In the circuit shown below the current in the 1 Ω resistor is :

(1)   1.3 A from P to Q
(2)   0 A
(3)   0.13 A from Q to P
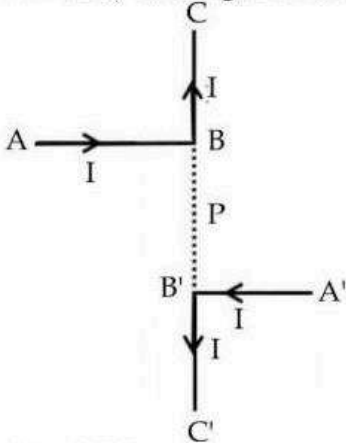(4)   0.13 A from P to Q

Correct Marks : 5 Wrong Marks : 1

The current sensitivity of a moving coil galvanometer is doubled by making the number of turns double. Then its voltage sensitivity will be :

(1)   Double
(2)   Half
(3)   1/4 times
(4)   Remain unchanged

Current through ABC and A'B'C' is I as shown in the given figure. If, PB = PB' = r and C'B'PBC are collinear, the magnetic field at P is :

(1)   2I/4πr

(2)   2μ₀I/4πr

(3)   μ₀/4πr

(4)   Zero

Question Number : 665 Question Id : 4641992169 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Match List-I with List-II :

	List-I Rule		List-II Statement
(A)	Ampere Swimming Rule	(I)	Direction of induced current in a conductor
(B)	Fleming's Left hand Rule	(II)	Direction of magnetic field lines due to current through circular coil
(C)	Fleming's Right hand Rule in straight conductor	(III)	Direction of deflection of magnetic needle due to current
(D)	Right Hand Thumb Rule	(IV)	Direction of force on a current carrying conductor due to magnetic field

Choose the **correct** answer from the options given below :

(1)   (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

(2)   (A)-(II), (B)-(III), (C)-(IV), (D)-(I)

(3)   (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

(4)   (A)-(IV), (B)-(I), (C)-(II), (D)-(III)

Question Number : 666 Question Id : 4641992170 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Two identical coaxial coils P and Q carrying equal current in the same direction are brought nearer. The current in :

(1)   P increases while in Q decreases

(2)   Q increases while in P decreases

(3)   Both P and Q increases

(4)   Both P and Q decreases

Question Number : 667 Question Id : 4641992171 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

A capacitor and a coil having a resistance R are in series are connected to a 6 Volt AC source. By varying the frequency of the source, maximum current of 600 mA is observed. If the same coil is now connected to a cell of emf 6 volt and internal resistance of 2 ohm, the current through it will be :

(1) 0.5 A
(2) 0.6 A
(3) 1.0 A
(4) 2.0 A

Question Number : 668 Question Id : 4641992172 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

In an LCR series circuit, source of emf is :
E = 30 sin (100t) and R = 120 Ω, L = 100 mH, C = 100 μF
(A) The numerical value of impedance
(B) The numerical value of Resistance R
(C) The numerical value of capacitive reactance
(D) The numerical value of inductive reactance
Arrange the values of quantities mentioned in (A, B, C, D) in increasing order.

(1) (A), (B), (C), (D)
(2) (A), (C), (B), (D)
(3) (B), (A), (D), (C)
(4) (D), (C), (B), (A)

Question Number : 669 Question Id : 4641992173 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

For a series LCR circuit, at the condition of resonance, the value of power factor will be :

(1) Zero
(2) 1.0
(3) 0.2
(4) 0.5

Question Number : 670 Question Id : 4641992174 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

The electric field of an EM wave in free space is given by $E = 10 \cos (10^7 t + kx)\ \hat{\jmath}$ V/m where t and x are in sec and meter respectively. It can be inferred that :
(A) The wavelength λ is 188.4 m
(B) The wave number k is 0.33 rad/m
(C) The wave amplitude is 10 V/m
(D) The wave is propagating along $+x$ direction
Which of the following pairs of statement are **correct** ?

(1) (C) and (D)
(2) (A) and (B)
(3) (B) and (C)
(4) (A) and (C)

Question Number : 671 Question Id : 4641992175 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Arrange the following in increasing order of focal length of convex lens.

(A) F_v focal lengths of voilet

(B) F_r focal lengths of red

(C) F_b focal lengths of blue

(D) F_y focal lengths of yellow

Choose the **correct** answer from the options given below :

(1) (A), (B), (C), (D)

(2) (A), (C), (D), (B)

(3) (B), (A), (D), (C)

(4) (C), (B), (D), (A)

Question Number : 672 Question Id : 4641992176 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Light from point source in air falls on a spherical glass surface ($n = 1.5$ and radius of curvature = 10 cm). The distance of the light source from the glass surface is 50 cm. The position at which the image is formed is :

(1) 100 cm in the air

(2) 150 cm in the glass surface

(3) 200 cm in the air

(4) 50 cm in the glass surface

Question Number : 673 Question Id : 4641992177 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Read the following :

(A) The width of central band in diffraction pattern.

(B) The width of first bright band in diffraction pattern.

(C) The width of central band in diffraction pattern if D is doubled

(D) The width of first bright band in diffraction pattern if D is tripled
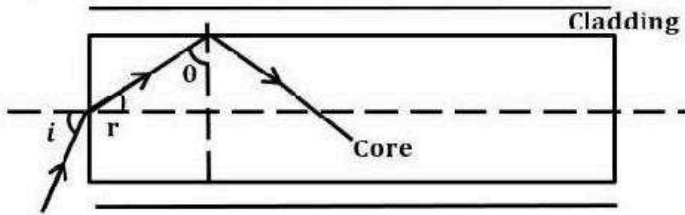
Choose the **correct** answer from the options given below in increasing order of width.

(1) (A), (B), (D), (C)

(2) (A), (C), (D), (B)

(3) (C), (A), (D), (B)

(4) (B), (A), (D), (C)

Question Number : 674 Question Id : 4641992178 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

For a light pipe as shown in the figure :

(A) Optical density of core should be greater than the optical density of cladding
(B) r and θ will always be equal
(C) Optical density of cladding is sinθ.sin*i* / sin*r*
(D) Optical density of cladding is sin*r*.sin*i* / sinθ

Choose the **correct** answer from the options given below :

(1) (A), (B) and (D) only
(2) (A), (B) and (C) only
(3) (A), (C) only
(4) (B), (C) and (D) only

Question Number : 675 Question Id : 4641992179 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

If the energy of incident radiation is increased by 25%. The kinetic energy of the photoelectrons emitted from the metal surface increased from 0.6 eV to 0.9 eV. The work function of the metal is :

(1) 1 eV
(2) 1.2 eV
(3) 1.5 eV
(4) 0.6 eV

Question Number : 676 Question Id : 4641992180 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

If the momentum of electron is changed by P then the de Broglie wavelength associated with it changes by 1 %. The initial momentum of electron will be :

(1) 200 P
(2) 100 P
(3) 300 P
(4) 150 P

Question Number : 677 Question Id : 4641992181 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Consider the following particles :

(A)   Proton

(B)   α particle

(C)   Electron

For charge to mass ratio of the above particles we can say :

(1)   (C) > (A) > (B)

(2)   (A) < (C) < (B)

(3)   (B) = (A) > (C)

(4)   (C) = (B) > (A)

Question Number : 678 Question Id : 4641992182 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

As per Nuclear Physics there is close relationship between mass number and radius of nucleus. If mass number of A is 216 and mass number of B is 27, then the ratio of nuclear radius (r_A / r_B) of the two elements is :

(1)   2 : 1

(2)   4 : 1

(3)   6 : 1

(4)   8 : 1

Question Number : 679 Question Id : 4641992183 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

An equilateral prism is made of material of refractive index √3. Angle of minimum deviation through the prism is :

(1)   60°

(2)   30°

(3)   45°

(4)   0°

Question Number : 680 Question Id : 4641992184 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

When photon of energy hν falls on a photosensitive metallic surface (work function h$ν_0$) electrons are emitted from the metallic surface. It is possible to say that :

(1)   All ejected electrons have the same KE equal to (hν − h$ν_0$)

(2)   The ejected electrons have a distribution of KE, the most energetic ones having KE equal to (hν − h$ν_0$)

(3)   The most energetic electrons having KE equal to hν

(4)   The KE of ejected electrons is h$ν_0$

Question Number : 681 Question Id : 4641992185 Question Type : MCQ Option Shuffling : No

Correct Marks : 5 Wrong Marks : 1

Two parallel plate capacitors, each of the capacitance 40 μF are connected in series. The space between the plates of one capacitor is filled with a material of dielectric constant K = 4. The equivalent capacitance of the system would be :

(1)   30 μF

(2)   31 μF

(3)   32 μF

(4)   33 μF

Question Number : 682 Question Id : 4641992186 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

The Wheatstone bridge is an arrangement of four resistances, say R_1, R_2, R_3 and R_4. The null point condition is given by :

(1) $R_1/R_2 = R_3/R_4$

(2) $R_1 + R_2 = R_3 + R_4$

(3) $R_1 - R_2 = R_2 - R_4$

(4) $R_1 \times R_2 = R_3 \times R_4$

Question Number : 683 Question Id : 4641992187 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

A long solenoid is formed by winding insulated copper wire at the rate of 20 turns per cm. The current that is necessary to produce a magnetic field of 20 mT inside the solenoid at its centre would be :

(1)   7.0 A

(2)   8.0 A

(3)   9.0 A

(4)   10.0 A

Question Number : 684 Question Id : 4641992188 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

Study of radioactive decay of unstable nuclei resulting in emission of a particle lead us to four different observations listed below :

(A)   no change in atomic number and mass number.

(B)   no change in mass number but the atomic number decreases by 1.

(C)   no change in mass number but the atomic number increases by 1.

(D)   atomic number decreases by 2 and the mass number decreases by 4.

Arrange the particles emitted in the above four cases in **correct** sequence.

Choose the **correct** answer from the options given below.

(1)   alpha particle, positron, electron, photon.

(2)   alpha particle, electron, positron, photon.

(3)   photon, positron, electron, alpha particle.

(4)   alpha particle, positron, photon, electron.

Question Number : 685 Question Id : 4641992189 Question Type : MCQ Option Shuffling : No
Correct Marks : 5 Wrong Marks : 1

In a p type semiconductor the acceptor level is situated 50 meV above the valence band. The maximum wavelength of light required to produce a hole will be :

(1) 24.8×10^{-5} m

(2) 0.248×10^{-5} m

(3) 2.48×10^{-5} m

(4) 248×10^{-5} m

Question Id.	Key	Question Id.	Key
ENGLISH		ENGLISH	
4641992140	1	4641992185	3
4641992141	1	4641992186	1
4641992142	4	4641992187	2
4641992143	2	4641992188	3
4641992144	1	4641992189	3
4641992145	4		
4641992146	4		
4641992147	2		
4641992148	1		
4641992149	2		
4641992150	1		
4641992151	2		
4641992152	2		
4641992153	3		
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4641992180	2		
4641992181	1		
4641992182	1		
4641992183	1		
4641992184	2		