PHYSICS

BOOKS - DC PANDEY ENGLISH

SOLVED PAPERS 2018

Neet

1. A carbon resistor of $(47 \pm 4.7)k\Omega$ is to be marked with rings of different colours for its

identification. The colour code sequence will be

A. Yellow- Green-Violet-Gold

B. Yellow-Violet-Orange-Silver

C. Violet-Yellow-Orange-Silver

D. Green-Orange-Violet-Gold

Answer: B

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2. A set of $'n'$ equal resistor, of value of $'R'$ each are connected in series to a battery of emf $'E'$ and internal resistance $'R'$. The current drawn is I. Now, the $'n'$ resistors are connected in parallel to the same battery. Then the current drawn from battery becomes 10.1. The value of $'n'$ is

A. 20

B. 11

C. 10

D. 9

Answer: C

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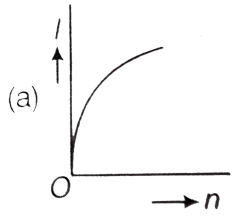
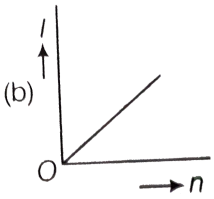
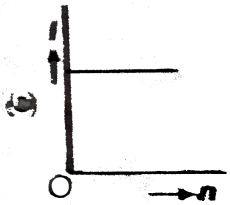
3. Which of the options give below are correct?

A. 

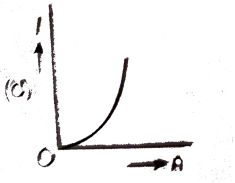
B.



C.



D.



Answer: C

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4. Unpolarised light is incident from air on a plane surface of a material of refractive index μ. At a particular angle of incidence i, it is found that the reflected and refracted rays are perpendicular to each other. Which of the following options is correct for this situation?

A. $i = \sin^{-1}\left(\frac{1}{\mu}\right)$

B. Reflected light is polarised with its electric vector perpendicular to the plane of incidence.

C. Reflected light is polarised with its electric vector parallel to the plane of incidence.

D. $i = \tan^{-1}\left(\frac{1}{\mu}\right)$

Answer: B

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5. In young's double slit experimental the separation d between the slits is 2 mm, the wavelength λ of the light used is 5896Å and

distance D between the screen and slitps is 100 cm . It is found that the angular width of the fringes is 0.20° . To increase the fringe angular width to 0.21° (with same λ and D) the separation between the slits needs to be changed to

A. 2.1 mm

B. 1.9 mm

C. 1.8 mm

D. 1.7 mm

Answer: B

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6. An astronomical refracting telescope will have large angular magnification and high angular resolution, when it has an objective lens of

A. large focal length and large diameter

B. large focal length and small diamter

C. small focal length and large diameter

D. small focal length and small diameter

Answer: A

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7. The ratio of kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom, is

A. $2:-1$

B. $1:1$

C. $1:1$

D. $1:-2$

Answer: B

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8. An electron (mass m) with na initial velocity $v = v_0 i (v_o > O)$ is in an electric field $E = -E_0 \hat{i} (E_0 = \text{constant} > 0).$ It's de-Broglie wavelength at time t is given by

A. $\lambda_0 t$

B. $\lambda_0 \left(1 + \frac{eE_0}{mv_0} t\right)$

C. $\frac{\lambda_0}{\left(1 + \frac{eE_0}{mv_0} t\right)}$

D. λ_0

Answer: C

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9. For a radioactive material, half-life is 10 minutes. If initially there are 600 number of nuclei, the time taken (in minutes) for the disintegration of 450 nuclei is.

A. 30

B. 10

C. 20

D. 15

Answer: C

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10. The frequency of oscillation of current in the indcutor is

A. $4:1$

B. $1:4$

C. $1:2$

D. $2:1$

Answer: C

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11. There identical point masses, each of mass 1 kg lie in the xy-plane at points (0, 0), (0, 0.2 m)

and (0, 2m, 0). The net gravitational force on the mass at the origin is:

A. $I_B = 20\mu A, I_C = 5mA, \beta = 250$

B. $I_B = 25\mu A, I_C = 5mA, \beta = 200$

C. $I_B = 40\mu A, I_C = 10mA, \beta = 250$

D. $I_B = 40\mu A, I_C = 5mA, \beta = 125$

Answer: D

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12. In a $p-n$ junction diode, change in temperature due to heating

A. does not affect resistance of p-n junction

B. affects only forward resistance

C. affects only reverse resistance

D. affects the overall V-I characteristics of p-n junction.

Answer: D

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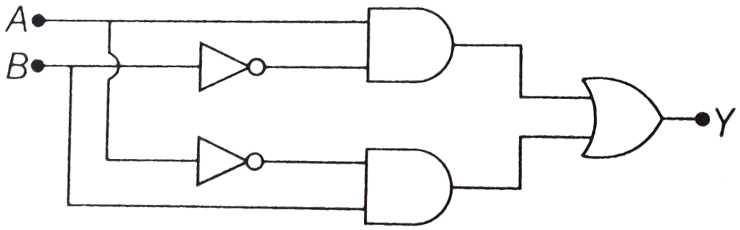
13. In the circuit shown in the figure, find the output



A. $\overline{A.B} + A.B$

B. $A.\overline{B} + \overline{A}.B$

C. $\overline{A.B}$

D. $\overline{A+B}$

Answer:

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14. A coaxial cable is made up of two conductors. The inner conductor is solid is of radius R_1 and the outer coductor is hollow of inner radius R_2 and outer radius R_3 . The space between the conductors are carrying currents of equal magnitudes and in oppsite direactions. then the variation of magnetic field with distance form the axis is best

plotted as :

A. $-y-direction$

B. $+z-direction$

C. $-z-$ direction

D. $-x-$ direction

Answer: B

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15. The refractive index of the material of a prism is $\sqrt{2}$ and the angle of the prism is 30°. One of the two refracting surfaces of the prism is made a mirror inwards, by silver coating. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is

A. 30°

B. 45° C

C. $60^{\circ}C$

D. zero

Answer: B

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16. A driver having a definite reaction time is capable of stopping his car over a distance of 30 m on seeing a red traffic signal, when the speed of the car is 72 km/hr andover a distance of 10 m when the speed is 36 km/hr.

Find the distance over which he can stop the car if it were running at a speed of 54 km/hr. Assume that his reaction time and the deceleration of the car remains same in all the three cases.

A. 30 cm towards the mirror

B. 36 cm away from the mirror

C. 30 cm away from the mirror

D. 36 cm towards the mirror

Answer: B

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17. The magnetic potential energy stored in a certain inductor is $25mJ$, when the current in the inductor is $60mA$. This inductor is of inductance

A. 1.389 H

B. 138.88 H

C. 0.138 H

D. 13.89 H

Answer: D

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18. An electron falls from rest through a vertical distance h in a uniform and vertically upward directed electric field E. the direction of electric field is now reversed, keeping its magnitude the same. A proton is allowed to fall from rest in it through the same vertical distance h.The time of fall of the electron, in comparison to the time of flal of the proton is

A. 10 times greater

B. 5 times greater

C. smaller

D. equal

Answer: C

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19. The electrostatic force between the metal plate of an isolated parallel plate capacitro C having charge Q and area A, is

A. proportional to the square root of the distance betweenthe plates

B. linearly proportional to the distance between the plates

C. independent of the distance between the paltes

D. inversely proportional to the distance between the plates.

Answer: C

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20. A metallic rod of mass per unit length $0.5kgm^{-1}$ is lying horizontally on a straght inclined plane which makes an angle of 30° with the horizontal. The rod is not allowed to slide down by flowing a current throguh it when a magnetic field of induction $0.25T$ is acting on it in the vertical direction. The current flowing in the rod to keep it stationary is

A. 14.76 A

B. 5.98 A

C. 7.14 A

D. 11.32 A

Answer: D

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21. A thin diamagnetic rod is placed vertically between the poles of an electromagnet. When the current in the electromagnetic is switched on, then the diamagnetic rod is pushed up,

out of the horizontal magnetic field. Hence the rod gains horizontal potential energy. the work required to do this comes from

A. The lattice structure of the material of the rod

B. the magnetic field

C. the current source

D. the induced electric field du to the changing magnetic field

Answer: C

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22. A satellite is launched into a circular orbit of radius R around the earth while a second satellite is launched into an orbit of radius 1.02R. The percentage difference in the time period is:

A. 2.74 W

B. 0.43 W

C. 0.79 W

D. 1.13 W

Answer: C

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23. Current senstivity of moving coil galvanometer is $5\text{div}/mA$ and its voltage senstivity (angular deflection per unit voltage applied) is $20\text{div}/V$. The resistance of the galvanometer is

A. `250 Ohm

B. `25 Ohm

C. $40Ohm$

D. `500 Ohm

Answer: A

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Aiims

1. A metal wire has a resistance of 35Ω. If its length is increased to double by drawing it,

then its new resistance will be

A. 70Ω

B. 140Ω

C. 105Ω

D. 35Ω

Answer: B

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2. Four particles of masses m,2m , 3m and 4m are kept in sequence at the corners of a square of side a. The magnitude of gravitational force acting on a particle of mass m placed at the centre of the square sill be:

A. zero

B. $\frac{k\lambda}{R}$

C. $\frac{2k\lambda}{R}$

D. $(k\pi\lambda)R$

Answer: C

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3. Positive charge Q is distributed uniformly over a circular ring of radius R. A particle having a mass m and a negative charge q, is placed on its axis at a distance x from the centre. Find the force on the particle. Assuming x is very less than R, find the time period of oscillation of the particle if it is released from there.

A. $\left[\frac{16\pi^3\varepsilon_0 R^3 m}{Qq}\right]^{1/2}$

B. $\left[\frac{8\pi^2\varepsilon_0 R^3}{q}\right]^{\frac{1}{2}}$

C. $\left[\frac{2\pi^3\varepsilon R^3}{3q}\right]^{1/2}$

D. None of these

Answer: A

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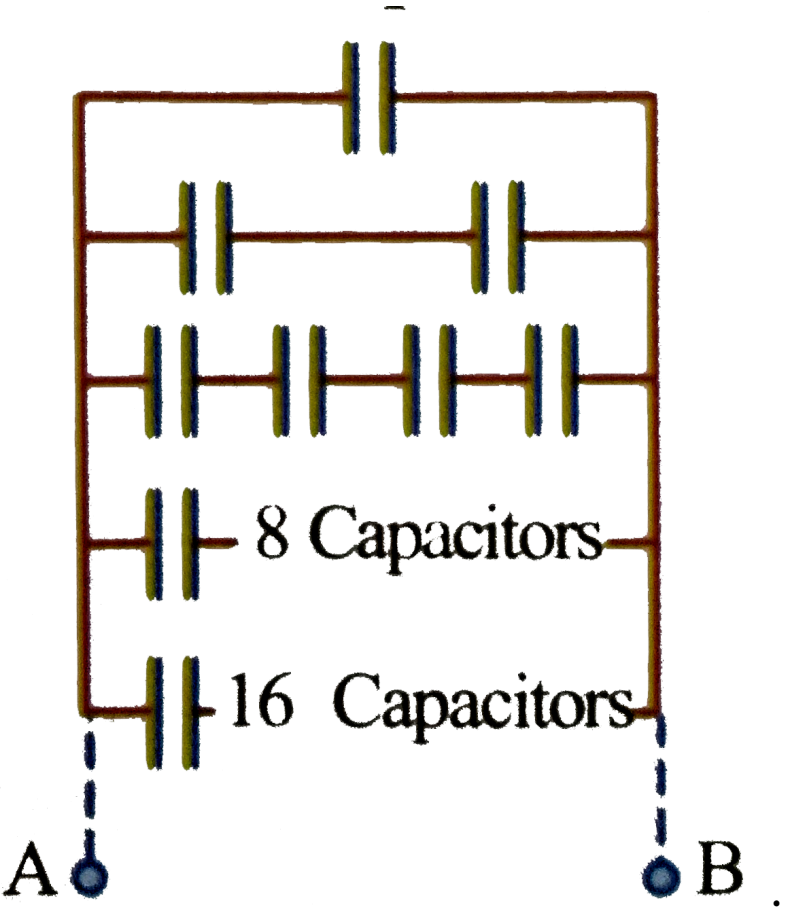
4. An infinite number of identical capacitors each of capacitance $1mF$ are connected as shown in the figure. Then the equivalent

capacitance between A and B is.



A. $1\mu F$

B. $2\mu F$

C. $\frac{1}{2}\mu F$

D. ∞

Answer: B

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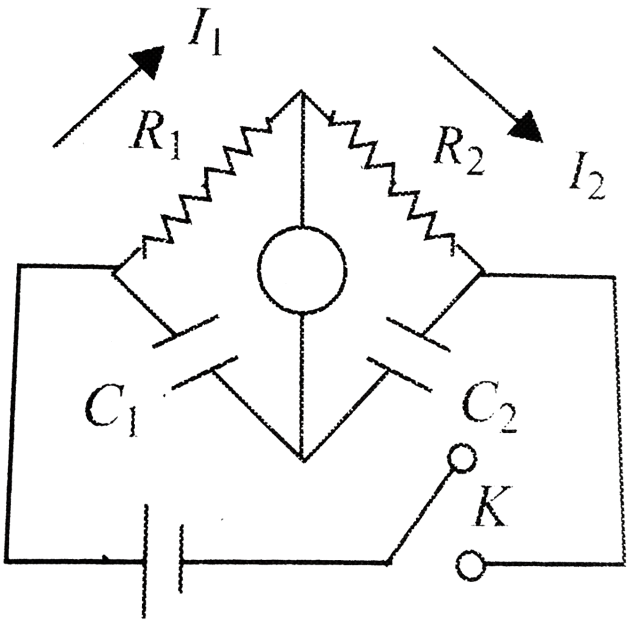
5. In the circuit in fig. If no current flows through the galvanometer when the key k is closed, the bridge is balanced. The balancing

condition for bridge is



A. $\frac{C_1}{C_2} = \frac{R_1}{R_2}$

B. $\frac{C_1}{C_2} = \frac{R_2}{R_1}$

C. $\left(\frac{C_1^2}{C_2^2} = \frac{R_1^2}{R_2^2}\right)$

D. $\frac{C_1^2}{C_2^2} = \frac{R_2}{R_1}$

Answer: B

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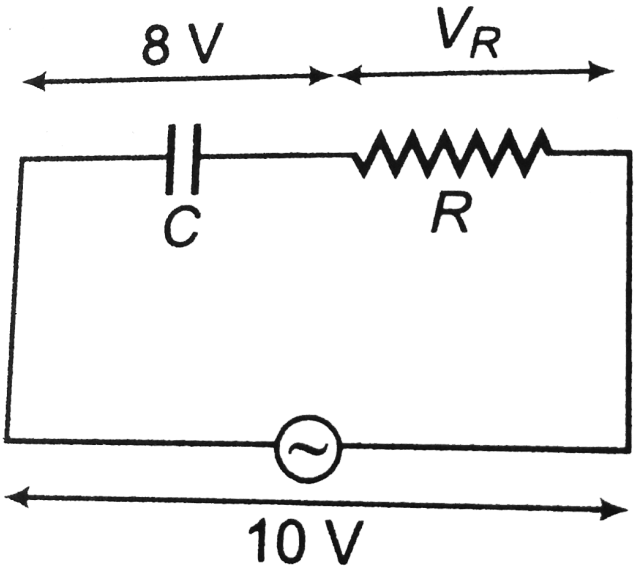
6. In a series $C - R$ circuit shown in figureure, the applied voltage is $10V$ and the voltage across capacitor is found to$8V$. The voltage across R, and the phase difference between current and the applied voltage will

respectively be



A. 6V, $\tan^{-1}\left(\frac{4}{3}\right)$

B. $3V$, $\tan^{-1}\left(\frac{3}{4}\right)$

C. $6V$, $\tan^{-1}\left(\frac{5}{3}\right)$

D. None of these

Answer: A

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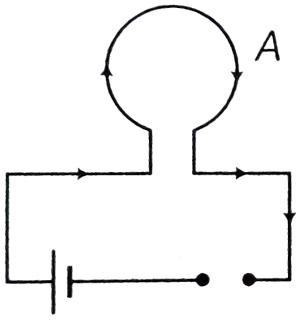
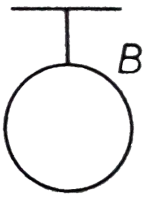
7. A system S consists of two coils A and B. The coil, A carries a steady current I. While the coil B is suspended nearby as shown in figure. Now, if the system is heated, so as to raise the temperature of two coils steadily, then





A. the two coils shows attraction

B. the two coils shows repulsion

C. there is no change in the position of the two coils

D. induced current are not possible in coil B

Answer: A

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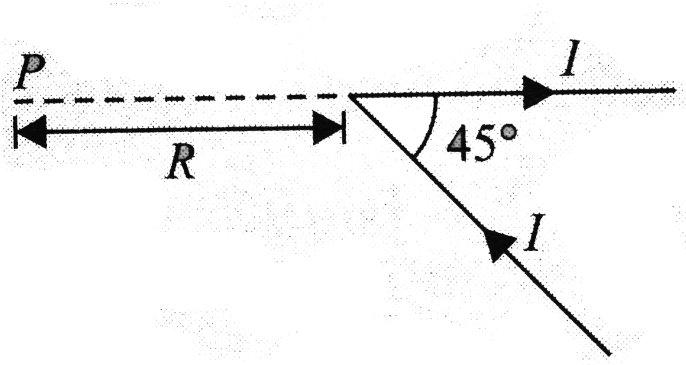
8. A long straight wire, carrying current I, is bent at its midpoint to form an angle of 45°. Find the induction of magnetic field at point P, distant R from the point of bending (as shown in)



A. $\dfrac{\left(\sqrt{2}-1\right)\mu_0 l}{4\pi R}$

B. $\dfrac{\left(\sqrt{2}+1\right)\mu_0 l}{4\sqrt{2}\pi R}$

C. $\frac{\sqrt{2-1}\mu_0 l}{4\sqrt{2}\pi R}$

D. $\frac{\left(\sqrt{2}+1\right)\mu_0 l}{4\sqrt{2}\pi R}$

Answer: A

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9. An element $d\vec{l} = dx\hat{i}$ (where $dx = 1cm$) is placed at the origin and carries a large current $i = 10A$. What is the magnetic field on the Y-axis at a distance of $0.5m$?

A. $2 \times 10^{-8} \hat{k} T$

B. $4 \times 10^{-8} \hat{k} T$

C. $-2 \times 10^{-8} \hat{k} T$

D. $-4 \times 10^{-8} \hat{k} T$

Answer: B

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10. The coil in figure carries current i=2.00 A in the direction indicated is parallel to an xz plane, has 3.00 turns and an area of

$4.00 \times 10^{-3} m^2$, and lies in a uniform magnetic field $\bar{B} = \left(2.00\hat{i} - 3.00\hat{j} - 4.00\hat{k}\right) mT$. What are (a) the orientation energy of the coil in the magnetic field and (b) the torque (in unit-vector notation) on the coil due to the magnetic field?

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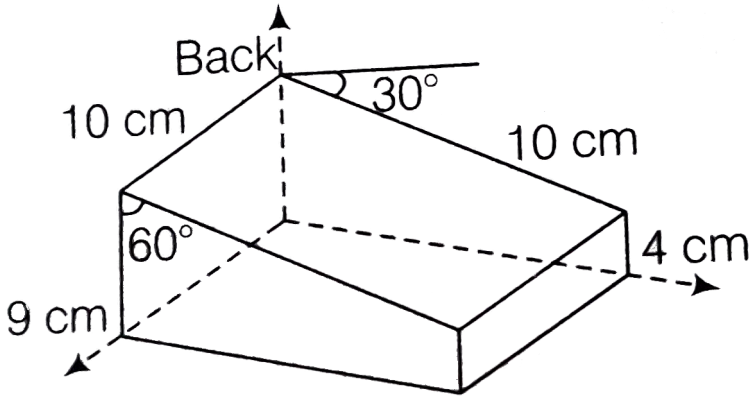
11. Consider the following figure, a uniform magnetic field of 0.2 T is directed along the positive X-axis. The magnetic flux through top surface of the figure.



A. zero

B.

C. 0.8 m-Wb

D. -1.8m-Wb

Answer: C

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12. An idal coil of 10 is connected in series with a resitance of 5Ω and a battery of 5V. After 2s, after the connection is made, the current flowing (in ampere) in the circuit is

A. (1-e)

B. e

C. e^{-1}

D. $\left(1-e^{-1}\right)$

Answer: D

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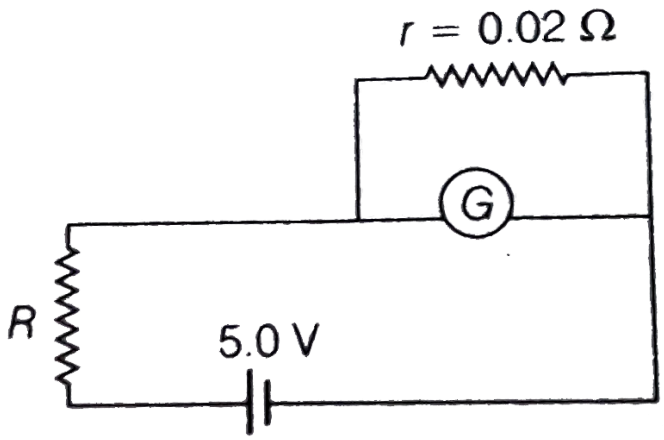
13. In the circuit, shown the galvanometer G of resistance 60Ω is shifted by a resistance r=0.02 Ω. The current through R is nearly 1A. The

value of resistance R (in ohm) is nearly.



A. 1.00Ω

B. 5.00Ω

C. 11.0Ω

D. 6.0Ω

Answer: C

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14. In a circuit L, C and R are connected in series with an alternating voltage source of frequency f. The current lead the voltages by 45°. The value of C is :

A. $\frac{1}{2\pi f(2\pi fL + R)}$

B. $\frac{1}{\pi f(2\pi fL + R)}$

C. $\frac{1}{2\pi f(2\pi fL - R)}$

D. $\frac{1}{\pi f(2\pi fL - R)}$

Answer: C

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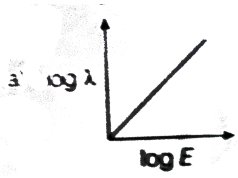
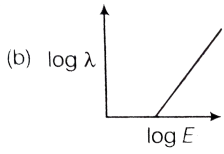
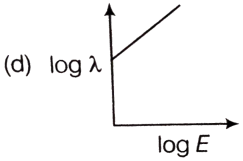
15. The log - log graph between the energy E of an electron and its de - Broglie wavelength λ will be

A. 

B. 

C.

D.



Answer: C

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16. The half life of a radioactive substance is 20 minutes . The approximate time interval $(t_2 - t_1)$ between the time t_2 when $\frac{2}{3}$ of it

had decayed and time t_1 when $\frac{1}{3}$ of it had decay is

A. 14 min

B. 20 min

C. 28 min

D. 7 min

Answer: B

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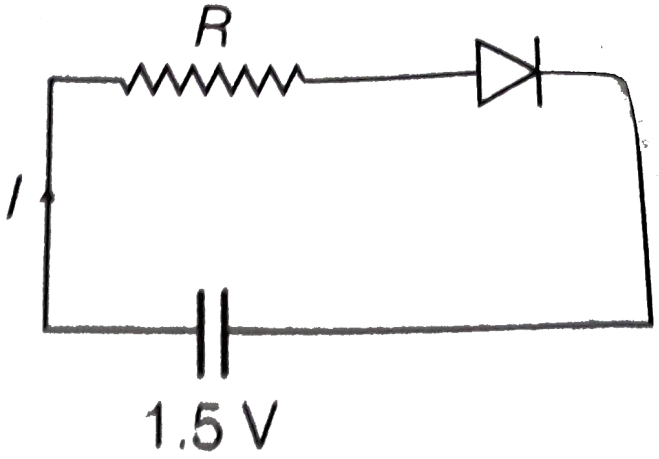
17. The diode used at a constant potential drop of 0.5 V at all currents and maximum power rating of 100 mW. What resistance must be connected in series diode, so that current in circuit is maximum?



A. 200Ω

B. 6.67Ω

C. 5Ω

D. 15Ω

Answer: C

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18. An upolarised beam of intensity $2a^2$ passes through a thin polarioid. Assuming zero absorption in the polariod, the intensity of emergent plane polarised light is

A. $2a^2$

B. a^2

C. $\sqrt{2}a^2$

D. $\frac{a^2}{2}$

Answer: B

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19. A hydrogen like atom of atomic number Z is in and excited state of quantum number 2n. It can emit a maximum energy photon of 204 eV.

If it makes a transition to quantum state n, photon of energy 40.8 eV is emitted. Find n , Z and the gound state energy (in eV) for this atom, Also calculate the minimum energy (in eV) that can be emitted by this atom during de-exitation, Ground state energy of hydrogen atom is $13.\ 6eV$

A. $10.32Mhz$

B. $10.61kHz$

C. $5.31MHz$

D. 5.31 kHz

Answer: B

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20. A diode detector is used to detect an amplitude modulated wave of 60% modulation by using a condenser of capacity 250 pico farad in parallel with a load resistance 100 kilo ohm. Find the maximum modulated frequency which could be detected by it.

A. 1.89 mm

B. 4mm

C. 1 mm

D. 3mm

Answer: A

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21. A circular loop of radius 0.3 cm lies parallel to amuch bigger circular loop of radius 20 cm. The centre of the small loop is on the axis of

the bigger loop. The distance between their centres is 15 cm. If a current of 2.0 A flows through the smaller loop, then the flux linked with bigger loop is

A. 9.1×10^{-11}Wb

B. 6×10^{-11}Wb

C. $3.3 \times 10^{-11} Wb$

D. 6.6×10^{-9}Wb

Answer: A

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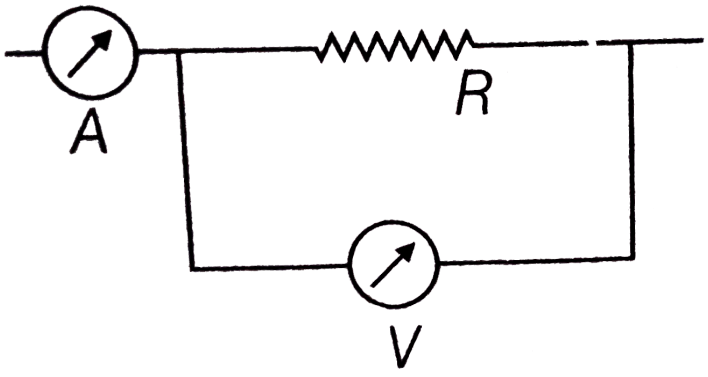
22. In the adjoining circuit diagram, the readings of ammeter and voltmeter are 2 A and 120 V, respectively. If the value of R is 75Ω, then the voltmeter resistance will be



A. 100Ω

B. 150Ω

C. 300Ω

D. 75Ω

Answer: C

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Assertion And Reasons

1. Assertion: Mass of a body decreases slightly when it is negatively charged.

Reason: Charging is due to transfer of electrons.

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2. Assertion: A dielectric slabis inserted between plates of an isolated capacitor. charge on capacitor will remain same.

Reason Charge on an isolated system is conserved.

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3. Assertion: Terminal voltage of a cell is greater than emf of cell during charging of the cell.

Reason: The emf of a cell is always greater than its terminal voltage.

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4. Assertion : Magnetic field interacts with a moving charge and not with a stationary charge.

Reason : A moving charge produces a

magnetic field.

(A)If both Assertion & Reason are True &the Reason is a correct explanation of the Assertion.

(B)If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.

(C)If Assertion is True but the Reason is False.

(D)If both Assertion & Reason are false.

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5. Assertion: Bulb generally get fused when they are switched on or off.

Reason: When we switch on or off, a circuit current changes in it rapidly.

(A) If both Assertion & Reason are True &the Reason is a correct explanation of the Assertion.

(B) If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.

(C) If Assertion is True but the Reason is False.

(D) If both Assertion & Reason are false.

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6. Assertion: A convex mirror always make a virtual image.

Reason: The ray always diverge after reflection from the convex mirror.

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7. Assertion: if a glass slab is placed in front of one of the slits, then fringe with will decreases.

Reason: Glass slab with produce an additional path difference.

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8. Assertion: If electrons in an atom were stationary, then they would fall into the nucleus.

Reason: Electrostatic force of attraction acts between negatively charged electrons and positive nucleus.

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9. Radioactive nuclei emit β^{-1} particles.

Electrons exist inside the nucleus.

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10. Assertion: Thickness of depletion layer is fixed in all semiconductor devices.

Reason: No free charge carriers are available in deplection layer.

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Jipmer

1. What is the magnetic moment of an electron orbiting in a circular orbit of radius r with a speed v?

A. $ev\frac{r}{2}$

B. evr

C. $\frac{er}{2v}$

D. None of these

Answer: A

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2. Two point charges $q_1 = 2 \times 10^{-3} C$ and $q_2 = -3 \times 10^{-6} C$ are separated by a distance $x = 10$ cm. Find the magnitude and nature of the force between the two charges.

A. 2×10^{-3}N

B. 6×10^{-3}N

C. 5×10^{-3}N

D. 1×10^{-3}N

Answer: B

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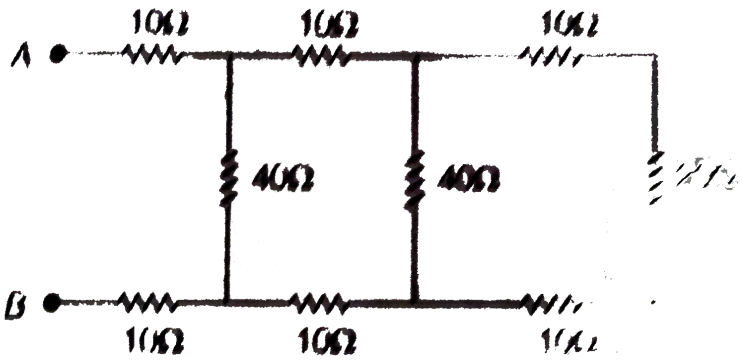
3. Find $R_{\neq t}$ between A and B.



A. 60Ω

B. 40Ω

C. 70Ω

D. 20Ω

Answer: B

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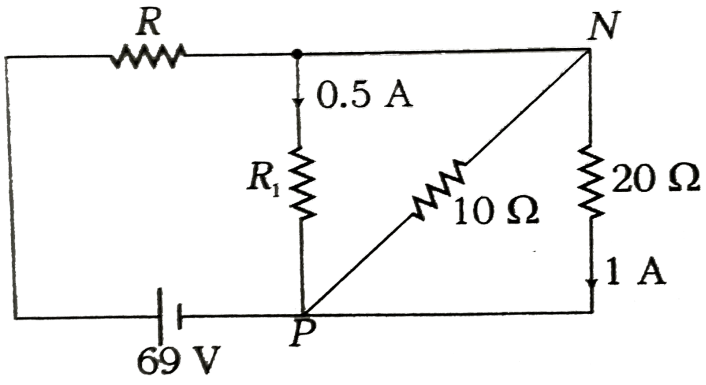
4. In the circuit shown in the figure,



A. 0.5 A

B. 0.2 A

C. 0.041666666666667

D. 0.083333333333333

Answer: A

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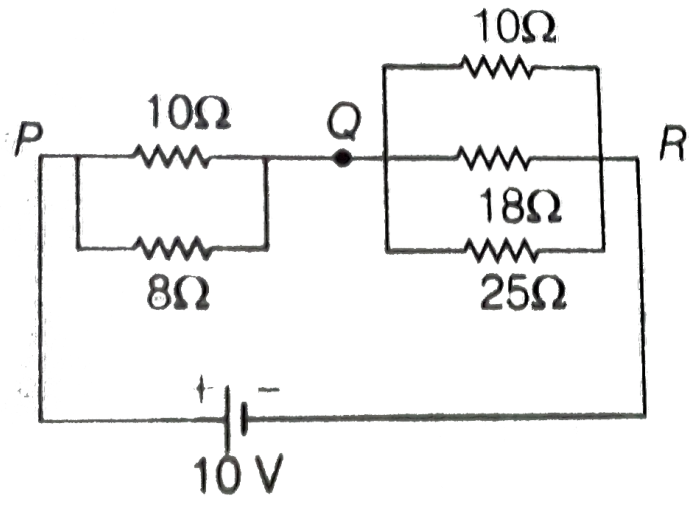
5. Find $V_P - V_Q$ in the circuit shown in figure.



A. 6.68 V

B. 8 V

C. 4.35 V

D. 7 V

Answer: C

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6. If a capacitor having capacittance 2F and plate separation of 0.5 cm will have area

A. $1130cm^2$

B. $1130m^2$

C. $1130km^2$

D. none of these

Answer: C

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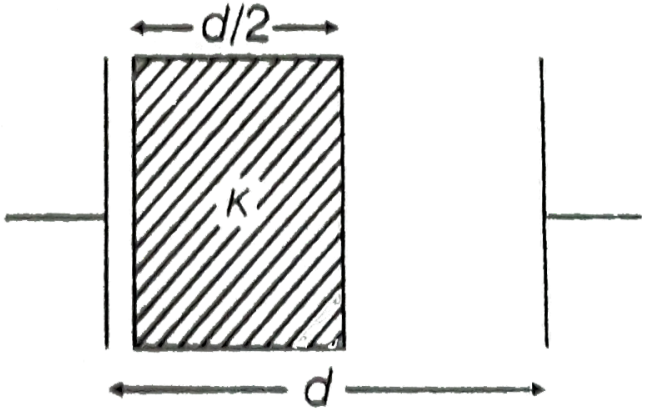
7. Find the capacitance in shown figure



A. $\frac{2KA\varepsilon_0}{(K+1)d}$

B. $\frac{2KA\varepsilon_0}{d}$

C. $\frac{(K+1)A\varepsilon_0}{2d}$

D. $\frac{2KA\varepsilon_0}{(K^2+1)d}$

Answer: A

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8. If minimum deviation = 30°, then speed of light in shown prism will be

A. $\frac{3}{\sqrt{2}} \times 10^8 m/s$

B. $\frac{1}{\sqrt{2}} \times 10^8 m/s$

C. $\frac{2}{\sqrt{3}} \times 10^8 m/s$

D. $\frac{2KA\varepsilon_0}{(K^2+1)d}$

Answer: A

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9. A current .I. flows through a metallic wire of radius .r. and the free electrons in it drift with a velocity v_d. Calculate the drift velocity of the free electrons through the wire of the same

material, having double the radius, when same current flows through it.

A. $4v_d$

B. $\frac{v_d}{4}$

C. $16v_d$

D. $\frac{v_d}{16}$

Answer: C

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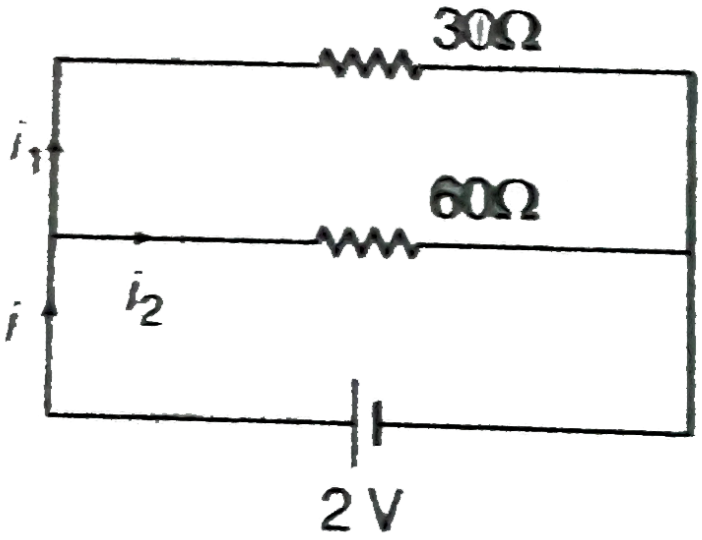
10. Find i in shown figure.



A. 0.2 A

B. 0.1 A

C. 0.3 A

D. 0.4 A

Answer: B

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11. which of these is a fustion reaction ?

A. $_{}(1)^{2}H + {}_{1}^{2}H \rightarrow {}_{2}^{4}He$

B. $_{}(0)^{1}n + {}_{92}^{235}U \rightarrow {}_{56}^{92}Kr + 3{}_{0}^{1}n$

C. Uranium decay

D. None of the above

Answer: A

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12. An electron is accelerated through a potential difference V. Write the expression for its final speed , if it was initially at rest.

A. $\sqrt{2}F$

B. F

C. 2F

D. $\frac{F}{2}$

Answer: A

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13. An atomic power nuclear reactor can deliver $300MW$. The energy released due to fission of each nucleus of uranium atom U^{238} is $170MeV$. The number of uranium atoms fissioned per hour will be.

A. 30×10^{25}

B. 4×10^{22}

C. 10×10^{2}

D. 5×10^{15}

Answer: B

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14. in the fusion reaction ${}_1H^2 + {}_1H^2 \rightarrow {}_2He^3 + {}_0N^1$, are masses of deuteron and neutron expressed in amu are 2.015, 3.017 and 1.0009, respectively , if 1 kg of deuterium undergoes complete fusion , then

find the amount of total energy released .

1 amu = 931.5 ME V/c^2.

A. 9.0×10^{13}J

B. 20×10^5 J

C. 5×10^{16}J

D. 8×10^5J

Answer: A

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15. A prism of crown glass with refracting angle of 5° and mean refractive index = 1.151 is combined with a flint glass prism of refractive index = 1.65 to produce deviation. Find the angle of fliint glass.

A. 3.92°

B. 4.68°

C. 5.32°

D. 7.28°

Answer: A

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16. Two slits are separated by a distance of $0.5mm$ and illuminated with light of $\lambda = 6000\text{Å}$. If the screen is placed $2.5m$ from the slits. The distance of the third bright image from the centre will be

A. 1.5 mm

B. 3mm

C. 6 mm

D. 9 mm

Answer: D

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17. Calculate the dispersive power for crown glass from the given data

$\mu_v = 1.523$ and $\mu_r = 1.5145.$

A. 0.01639

B. 1.05639

C. 0.05639

D. 2.05639

Answer: A

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18. The force of attractions between two charges $8\mu C$ and $-4\mu C$ is 0.2 N. Find the distance of separation.

A. 1.2 m

B. 12 m

C. 120 m

D. 0.12 m

Answer: D

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19. In a L-C circuit, angular frequency at resonance is ω. What will be the new angular frequency when inductor's inductance is made

two times and capacitor's capacitance is made four times?

A. $\frac{\omega}{2}\sqrt{2}$

B. $\frac{\omega}{\sqrt{2}}$

C. 2ω

D. $\frac{2\omega}{\sqrt{2}}$

Answer: A

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20. If an electron is moving with velocity v produces a magnetic field $\overrightarrow{B}$, then

A. $B \propto v \propto \frac{1}{r}$

B. $B \propto v \propto \frac{1}{r^2}$

C. $B \propto v^2 \propto \frac{1}{r}$

D. $B \propto v^2 \propto \frac{1}{r^2}$

Answer: B

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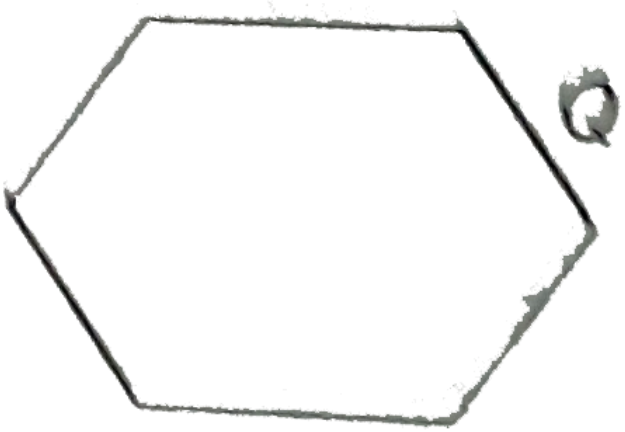
21. A regular hexagone of side a. A wire of length 24 a is coiled on that hexagone. If current in hexagone is I, then find the magnetic moment.



A. $6\sqrt{3}la^2$

B. $3\sqrt{3}la^2$

C. $\frac{3\sqrt{3}}{2}la^2$

D. $6la^2$

Answer: A

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22. The refractive index of glass is 1.5. The speed of light in glass is

A. 3×10^8 m//s

B. 2×10^8 m/s

C. 1×10^8 m/s

D. 4×10^8 m/s

Answer: B

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