

- 1) The quantities, which can be measured accurately are _____ Quantities (UHS: 2017)
 - a) Base
 - b) derived
 - c) physical
 - d) supplementary
- 2) An observer note reading of a scale from different angles (parallax) while measuring the length of a wire, what kind of error can occur? (UHS: 2017)
 - a) Systematic error
 - b) précised error
 - c) random error
 - d) zero error
- 3) The unit of electric charge is coulomb and one coulomb in terms of base unit is equivalent to (UHS: 2016)
 - a) A m
 - b) A s
 - c) J s⁻¹
 - d) C
- 4) The unit of temperature in base unit is: (UHS: 2015)
 - a) Celsius
 - b) degree
 - c) kelvin
 - d) Fahrenheit
- 5) The dimensions of pressure is (UHS: 2015)
 - a) [M⁻¹L²T⁻²]
 - b) [ML⁻¹T]
 - c) [M⁻¹L⁻²T⁻²]
 - d) [ML⁻¹T⁻²]
- 6) The dimension of coefficient of viscosity is: (UHS: 2015)
 - a) [M⁻²L⁻¹T⁻¹]
 - b) [ML⁻²T⁻¹]
 - c) [ML⁻²T]
 - d) [ML⁻¹T⁻¹]
- 7) If 'A' is the fundamental dimension of ampere. Then the dimension of magnetic field strength is: (UHS: 2015)
 - a) [MT²A⁻²]
 - b) [MT²A⁻¹]
 - c) [MT²L²A⁻¹]
 - d) [MT²L⁻²A⁻²]
- 8) The formula for electric field strength is 'E = F/q', where E is electric field strength, F is force and Q is charge. Which one of following gives correct base units for electric field strength. (UHS: 2014)
 - a) kgms⁻³A⁻¹
 - b) kgs⁻²A⁻³
 - c) kg²m⁻²s⁻³A
 - d) ms⁻¹A⁻³
- 9) Which set of prefixes gives values in increasing order? (UHS: 2014)
 - a) pico, mega, kilo, tera
 - b) pico, micro, mega, giga
 - c) tera, pico, micro, kilo
 - d) giga, kilo, milli, nano
- 10) Name the quantity that can be measured by using base unit 'kgm²s⁻³' (UHS: 2013)
 - a) weight
 - b) power
 - c) pressure
 - d) work
- 11) If 'm' is the mass, 'c' is the velocity of light and $x = mc^2$ then dimensions of 'x' will be: (UHS: 2012)
 - a) [LT⁻¹]
 - b) [ML²T⁻²]
 - c) [MLT⁻¹]
 - d) [MLT⁻²]
- 12) Electric charge on an object is measured as 5 μ C. How the value of this charge can be expressed in terms of base units: (UHS: 2012)
 - a) 5 x 100 A-sec
 - b) 5 x 10⁻⁶ A-sec
 - c) 5 x 10⁺⁶ C s
 - d) 5 x 100 C s
- 13) When the dimensions of both sides of an equation are equal, then the equation is said to be (UHS: 2011)
 - a) Simultaneous
 - b) Instantaneous
 - c) Homologous
 - d) Quadratic
- 14) Radian is the unit of angular displacement which can also be measured in degrees. How many radians are equal to one degree? (UHS: 2011)

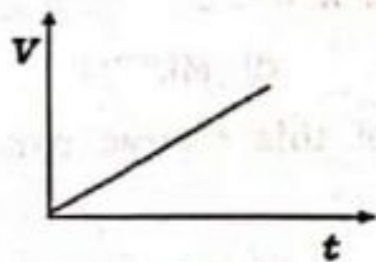
- a) $\frac{130}{\pi}$ b) $\frac{\pi}{180}$ c) $\frac{2\pi}{180}$ d) $\frac{\pi}{57.3}$
- 15) Which one is highest power multiple (UHS: 2010)
 a) giga b) mega c) tera d) deca
- 16) SI unit of charge is (UHS: 2010)
 a) ampere b) candela c) coulomb d) volt
- 17) The dimensions of gravitational constant 'G' are: (UHS: 2009)
 a) $[ML^{-2}T^{-1}]$ b) $[M^2L^{-2}T^{-1}]$ c) $[ML^{-2}T^{-2}]$ d) $[M^{-1}L^3T^{-1}]$
- 18) Force in terms of base units is expressed as (UHS: 2008)
 a) $kgms^{-2}$ b) kgm^2s^{-2} c) kgm^2s^{-3} d) none of these
- 19) The units of mc^2 are (UHS: 2008)
 a) kgm^2s^{-2} b) $kgms^{-2}$ c) Nms^{-2} d) both 'a' and 'c'
- 20) Light year is the measure of (UHS: 2008)
 a) time b) distance c) velocity d) intensity

2.

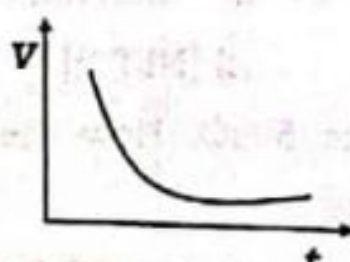
Motion and Force

MDCAT

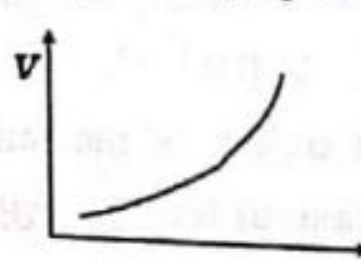
- 1) The ratio of displacement along diameter and total distance along circle; (UHS: 2017)
 a) $1 : \pi$ b) $2 : \pi$ c) $\pi : 1$ d) $\pi : 2$
- 2) Arshad is deriving down 7th street. He drives 150 meter in 18 seconds. Assume he does not speed up or slow down. What is his speed? (UHS: 2017)
 a) $0.38 ms^{-1}$ b) $8.33 ms^{-1}$ c) $126 ms^{-1}$ d) $58.33 ms^{-1}$
- 3) The distance travelled by moving car with velocity $15 ms^{-1}$ in 2 sec, decelerates at $2 ms^{-1}$ is equal to (UHS: 2017)
 a) 30 m b) 16 m c) 34 m d) 26 m
- 4) A body is moving with an initial velocity $2 kms^{-1}$, after a time of 50 sec its velocity becomes $1.5 kms^{-1}$. Its acceleration will be (UHS: 2009)
 a) $10 ms^{-2}$ b) $20 ms^{-2}$ c) $30 ms^{-2}$ d) $40 ms^{-2}$
- 5) When a car moves with constant acceleration, the velocity time graph is a : (UHS: 2009)



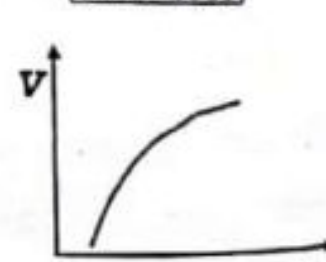
a)



b)



c)

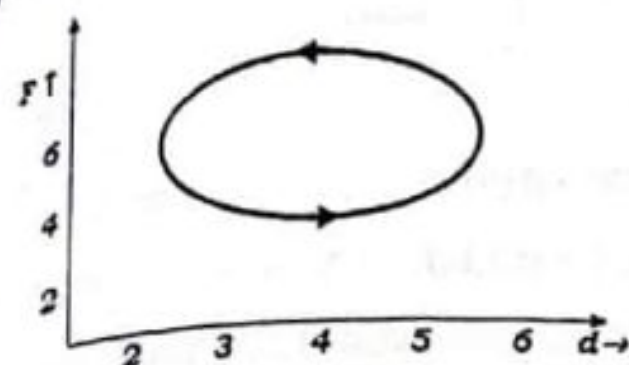


d)

- 6) An _____ missile is called a ballistic missile (UHS: 2008)
 a) unpowered, guided b) powered, guided
 c) unguided, powered d) unpowered, unguided

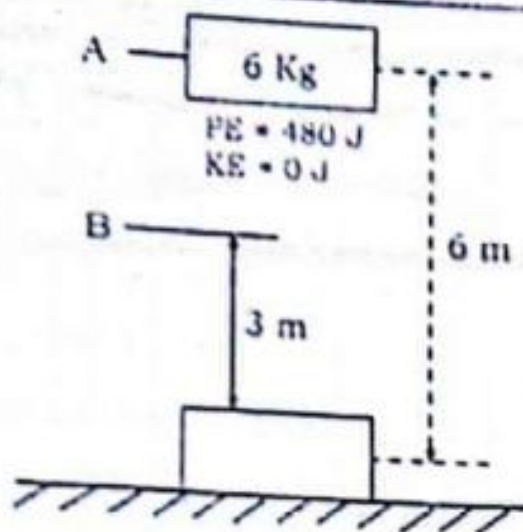
1) Total work done in figure

(UHS: 2017)



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- a) 24 Nm b) 8 Nm c) 16 Nm d) zero Nm
- 2) work done will be zero if angle between force and displacement is (UHS: 2017)
a) 0° b) 270° c) 60° d) 360°
- 3) If mass 'm' is dropped from height 'h' vertically, f is the force of friction during downward motion and v is the velocity at bottom, following equation will be hold (UHS: 2017)
a) $\frac{1}{2}mv^2 = mgh + fh$ b) $fh = mgh - \frac{1}{2}mv^2$ c) $mgh = \frac{1}{2}mv^2 - fh$ d) $mgh = \frac{1}{2}mv^2 + fh$
- 4) The horizontal range of a projectile, at a certain place is completely determined by (UHS: 2010)
a) angle of projection b) initial velocity of projection
c) mass of projectile d) speed and mass of projectile
- 5) Time of projectile's flight (UHS: 2010)
a) $\frac{v_i^2 \sin^2 \theta}{g}$ b) $\frac{v_i^2 \sin \theta}{g}$ c) $\frac{2v_i \sin \theta}{g}$ d) $\frac{v_i^2}{g} \sin 2\theta$
- 6) If the velocity of body changes by equal amount in equal interval of time, the body is said to have (UHS: 2010)
a) variable acceleration b) uniform acceleration c) uniform velocity d) zero velocity
- 7) In order to determine maximum height of projectile, the equation of motion used is (UHS: 2010)
a) $aS = v_f^2 - v_i^2$ b) $2aS = v_f^2 - v_i^2$ c) $S = v_i t + \frac{1}{2}at^2$ d) $v_f = v_i + at$
- 8) If a force of 12 N acts on a car and changes its momentum from 36 kgms^{-1} to 60 kgms^{-1} , the time during which this change occurs will be (UHS: 2010)
a) 24 s b) 12 s c) 2 s d) 8 s
- 9) Which of following is non-conservative force (UHS: 2010)
a) Elastic force of spring b) electric force c) gravitational force d) frictional force
- 10) If a certain force acts on an object and changes its KE from 65 J to 130 J, then work done by the force will be (UHS: 2009)
a) 92.5 J b) 97.5 J c) 65 J d) 130 J
- 11) An object of mass 6kg falls under the action of gravity. At initial position 'A'. Its potential energy is 480 J and KE is 0 J. During its downward journey at point 'B' its energies will be (UHS: 2009)



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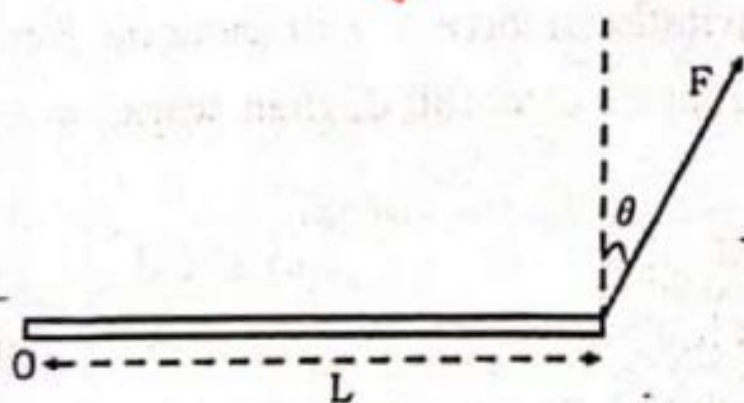
- a) PE = 300 J, KE = 180 J
 b) PE = 180 J, KE = 300 J
 c) PE = 230 J, KE = 250 J
 d) PE = 250 J, KE = 230 J
- 12) 100 joules work has been done by an agency in 10 seconds. What is power of agency? (UHS: 2008)
 a) 1000 W
 b) 10 W
 c) 0.1 W
 d) 100 W
- 13) Work done on a body equals change in its _____ energy (UHS: 2008)
 a) total
 b) KE
 c) PE
 d) All of these
- 14) A force of $2\mathbf{i} + \mathbf{j}$ has moved its point of application from (2,3) to (6,5). What is work done? (UHS: 2008)
 a) -10
 b) -18
 c) +10
 d) +18

4.

CIRCULAR MOTION

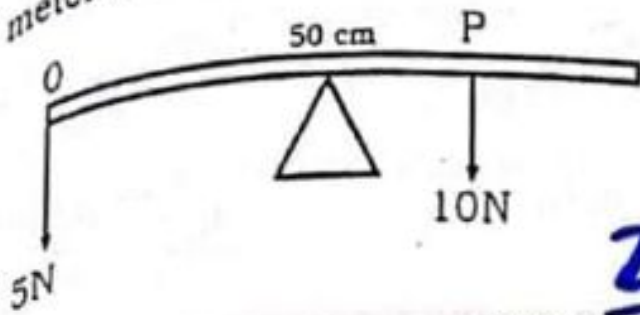
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- 1) A body moves in a circle with increasing angular velocity, at time $t = 6$ sec, angular velocity is 27 rad/s, what is the radius of circle, where linear velocity is 81 cm s^{-1} . (UHS: 2017)
 a) 6 cm
 b) 7 cm
 c) 9 cm
 d) 3 cm
- 2) A moon rotates about its axis. In future, scientists may wish to put a satellite into an orbit around moon such that satellite remains stationary above one point on moon's surface. The period of rotation of moon about its axis is 27.4 days. What is the radius of required orbit? ($M_m = 7.35 \times 10^{22} \text{ kg}$) (UHS: 2017)
 a) $3.59 \times 10^7 \text{ m}$
 b) $8.86 \times 10^7 \text{ m}$
 c) $4.23 \times 10^7 \text{ m}$
 d) $6.96 \times 10^6 \text{ m}$
- 3) If we double the moment arm, the value of torque becomes (UHS: 2016)
 a) half
 b) three times
 c) two times
 d) four times
- 4) A bar of length 'L' is pivoted at 'O' is acted by a force 'F' at an angle ' θ ' with vertical line as shown in fig. What is the moment of force? (UHS: 2015)



- a) $L \sin \theta$
 b) $LF \sin \theta$
 c) $L \cos \theta$
 d) $LF \cos \theta$

- 5) Two forces 5N and 10 N are acting at 'O' and 'P' respectively on a uniform meter rod suspended at the position of center of gravity 50 cm mark as shown in the figure. What is position of 'P' on meter Rod? (UHS: 2014)

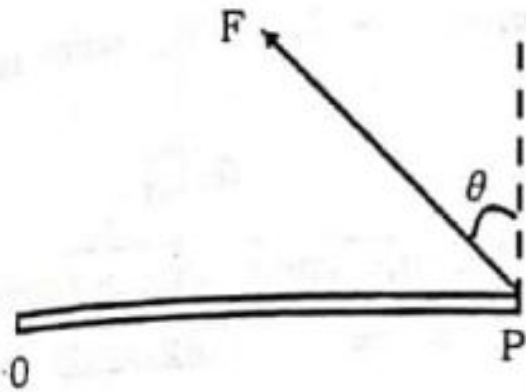


$$\tau = \tau$$

$$5N \times 50cm = 10N \times l_2$$

$$\frac{250}{10} = 10$$

- a) 80 cm b) 75 cm c) 70 cm d) 65 cm
- 6) Ratio of moment of inertia of two objects 'A' and 'B' is 2:3. Which one of following is the ratio of torques of 'A' and 'B' respectively. If both are being rotated with constant angular acceleration? (UHS: 2013)
- a) 3:4 b) 2:3 c) 3:2 d) 4:3
- 7) A force 'F' is acting at point 'P' of a uniform rod capable to rotate about 'O'. What is the torque about 'O'? (UHS: 2012)



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- a) $(OP)(F \tan \theta)$ b) $(OP)(F)$ c) $(OP)(F \sin \theta)$ d) $(OP)(F \cos \theta)$
- 8) If velocity is doubled then (UHS: 2010)
- a) momentum increases four times, KE increases two times
- b) momentum and KE remains same
- c) momentum remains constant, KE increases two times
- d) momentum increases two times, KE increases four times
- 9) The consumption of energy by 60 watt bulb in 2 seconds is: (UHS: 2010)
- a) 20 J b) 120 J c) 30 J d) 0.02 J
- 10) For a body in complete equilibrium (UHS: 2010)
- a) linear acceleration is zero b) angular acceleration is zero
- c) linear acceleration is zero but angular acceleration is not zero
- d) linear acceleration and angular acceleration both should be zero
- 11) If length of spanner is 'l' and a force 'F' is applied on it to tighten a nut such that it passes through the pivot point, then torque is (UHS: 2010)
- a) zero b) $F l \sin \theta$ c) $F l$ d) $F l \cos \theta$
- 12) A wheel of radius 1 m covers an angular displacement of 180° . Its linear displacement is (UHS: 2010)
- a) 3.14 m b) π rad c) 6.28 m d) 0.157 m
- 13) If a body is rotating with uniform angular velocity, then its torque is (UHS: 2009)

- a) zero b) maximum c) clockwise d) remains same
- 14) Linear velocity or tangential velocity of any particle moving in a circular path of radius 2 m with angular velocity 8 rad s^{-1} will be (UHS: 2009)
- a) 16 ms^{-1} b) 10 ms^{-1} c) 4 ms^{-1} d) 6 ms^{-1}
- 15) What is torque in circular motion? (UHS: 2009)
- a) $\tau = mr^2\pi$ b) $\tau = mr\alpha$ c) $\tau = mr^2\alpha$ d) $\tau = \frac{mr^2}{\alpha}$



OSCILLATIONS

MDCAT

- 1) In mass spring system, mass 'm' is attached with spring constant 'k' with time period ' T_1 '. If mass 'm' is replaced by '2m' with same spring. What is time period ' T_2 '? (UHS: 2017)
- a) $T_2 = T_1$ b) $T_2 = \sqrt{2}T_1$ c) $T_2 = 2T_1$ d) $T_2 = \frac{T_1}{\sqrt{2}}$
- 2) A body performing SHM with displacement $x = x_0 \sin(\omega t + \phi)$ when $t = 0$, $x = x_0$, what is the phase angle ϕ ? (UHS: 2017)
- a) π b) $\frac{\pi}{4}$ c) $\frac{\pi}{2}$ d) $-\pi$
- 3) Angular displacement of point moving in circle of radius 10 cm, when displacement of projection of this point along vertical diameter of circle is 8.66 cm, will be (UHS: 2017)
- a) 30° b) 45° c) 60° d) 75°
- 4) Tuning a radio is the best example of: (UHS: 2016)
- a) natural resonance b) free resonance c) mechanical resonance d) electrical resonance
- 5) The time period 'T' of a simple pendulum depends upon its length ' ℓ ' and acceleration due to gravity 'g', the correct equation for time period is (if K is constant) (UHS: 2016)
- a) $T = K\sqrt{\frac{g}{\ell}}$ b) $T = \frac{1}{K}\sqrt{\frac{g}{\ell}}$ c) $T = K\sqrt{\frac{\ell}{g}}$ d) $T = \frac{1}{K}\sqrt{\frac{\ell}{g}}$
- 6) Resonance occurs, when driving frequency is (UHS: 2016)
- a) greater than natural frequency b) unequal the natural frequency
- c) less than natural frequency d) equal to natural frequency
- 7) Mathematical formula of maximum velocity (v_0) for a body executing simple harmonic motion is: (UHS: 2015)
- a) $v_0 = \omega x_0$ b) $v_0 = v\sqrt{1 - \frac{x^2}{x_0^2}}$ c) $v_0 = \frac{k}{m}\sqrt{x_0^2 - x^2}$ d) $v_0 = m\sqrt{x_0^2 - x^2}$
- 8) What should be the ratio of KE to total energy for simple harmonic oscillator? (UHS: 2015)
- a) $1 - \frac{x^2}{x_0^2}$ b) 1 c) $x_0^2 - x^2$ d) $\frac{1}{2}x^2$
- 9) Frequency of simple pendulum of length 9.8 m will be (UHS: 2014)
- a) $2\pi \text{ Hz}$ b) $\pi/2 \text{ Hz}$ c) $1/2\pi \text{ Hz}$ d) $\pi/4 \text{ Hz}$

10) A body performing SHM with a period of 0.063 s. The maximum speed is 3.0 ms^{-1} . What are the values of amplitude ' x_0 (m)' and angular frequency ' ω (rad s^{-1})'? (UHS: 2014)

a) $x_0 = 0.03, \omega = 100$

b) $x_0 = 0.19, \omega = 16$

c) $x_0 = 5.3, \omega = 16$

d) $x_0 = 3.3, \omega = 100$

11) Food being cooked in microwave oven is an example of: (UHS: 2014)

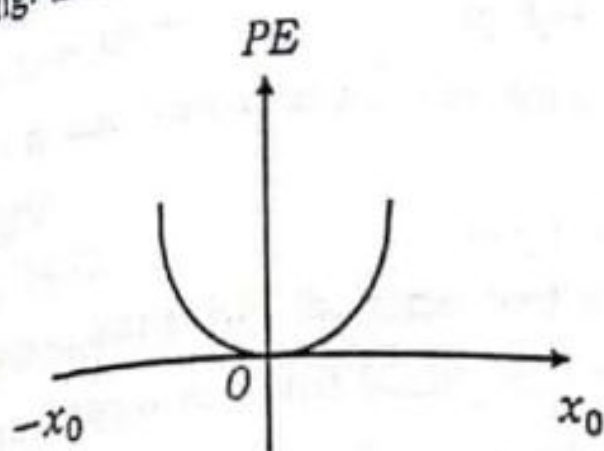
a) beats

b) overtones

c) resonance

d) stationary waves

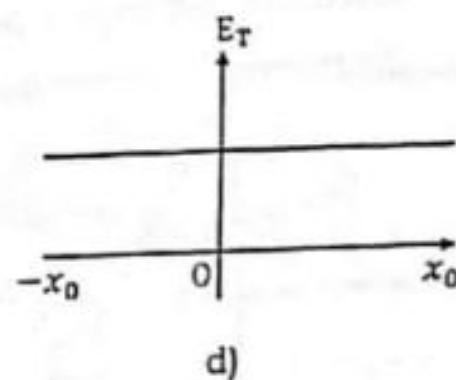
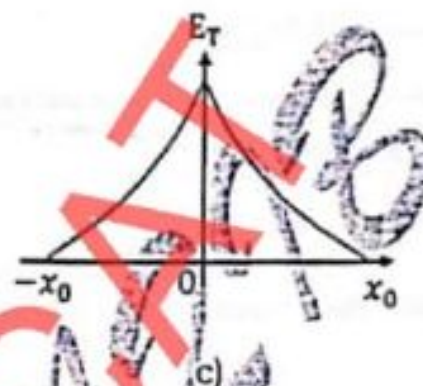
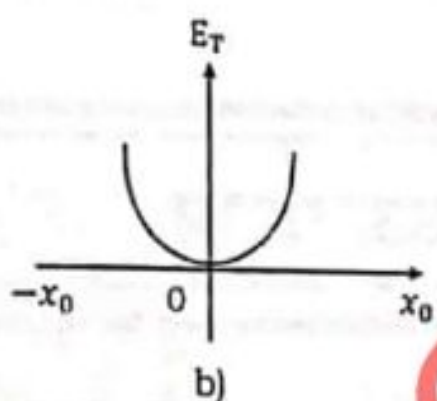
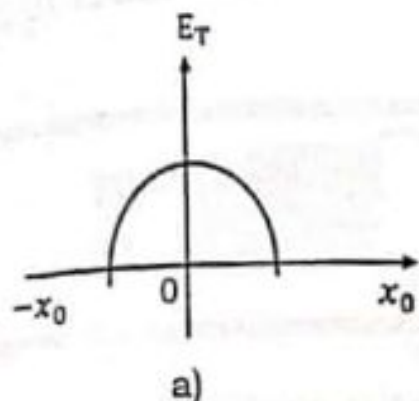
12) Potential energy of mass spring system with respect to displacement during SHM is shown in fig. (UHS: 2014)



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Which of following represents the total energy of mass spring system during SHM? (UHS: 2013)



13) For vibrating mass spring system, the expression of KE at any displacement ' x ' is given by: (UHS: 2013)

a) $\frac{1}{2} k x_0^2 \left(1 - \frac{x^2}{x_0^2}\right)$

b) $\frac{1}{2} k x_0^2$

c) $\frac{1}{2} m \omega^2 \left(1 - \frac{x^2}{x_0^2}\right)$

d) $\frac{1}{2} m \omega^2 x_0$

14) Variation of amplitude with respect to time for an oscillating object is shown in figure.



Identify the oscillation? (UHS: 2013)

a) damped

b) critical

c) un-damped

d) heavily damped

15) In SHM, with a radius x_0 , the velocity of the particle at any point is: (UHS: 2013)

a) $v = \omega \sqrt{x_0^2 - x^2}$

b) $v = \omega (x^2 - x_0^2)$

c) $v = \omega \sqrt{x_0 - x}$

d) $v = \omega \sqrt{x - x_0}$

16) A simple harmonic oscillator has a time period of 10 seconds. Which equation relates its acceleration ' a ' and displacement ' x '? (UHS: 2012)

a) $a = -2x$

b) $a = -(20\pi)x$

c) $a = -\left(\frac{2\pi}{10}\right)^2 x$

d) $a = -(20\pi)^2 x$

17) When the length of a simple pendulum is doubled, find the ratio of the new frequency to the old frequency? (UHS: 2012)

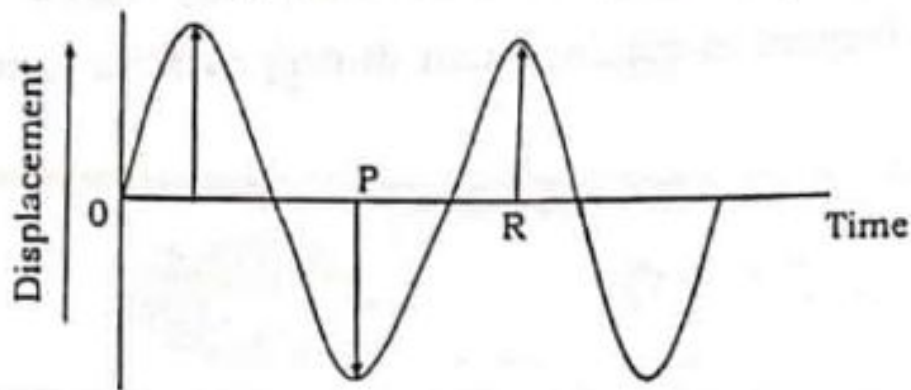
a) $1/4$

b) $1/2$

c) $\sqrt{2}$

d) $1/\sqrt{2}$

18) In the diagram below, the displacement of an oscillating particle is plotted against time. What does the length 'PR' on the time axis represents? (UHS: 2012)

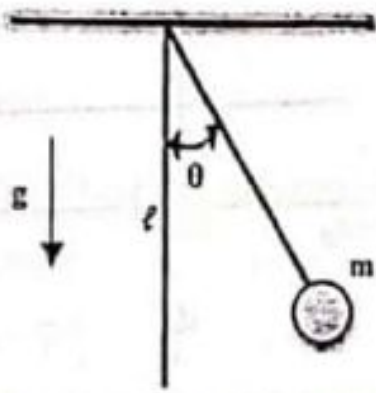


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a) Twice the frequency b) half the period

c) half the frequency d) Twice the period

19) A simple pendulum length 'L' with bob of mass 'm' is slightly displaced from its mean position so that its string makes an angle ' θ ' with vertical line as shown in the figure. Then bob of pendulum released. What will be the expression of torque with which the bob starts to move towards the mean position? (UHS: 2011)



a) mgL

b) $mgL \sin \theta$

c) 0

d) $mgL \cos \theta$

20) What is the period of mass spring system during SHM if the ratio of mass to spring constant is $1/4$? (UHS: 2011)

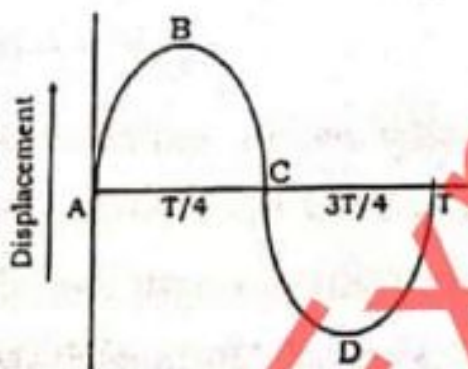
a) π

b) 2π

c) $1/\pi$

d) $1/2 \pi$

21) Waveform of SHM is given in figure. At what time/times displacement is equal to zero? (UHS: 2011)



a) $T/4$

b) $3T/4$

c) 0, $T/4$, $3T/4$ and T

d) 0, $T/2$ and T

22) A wire is stretched by a force which causes an extension. The energy is stored in it only when: (UHS: 2011)

a) Extension of wire is proportional to force applied

b) The cross-section area of the wire remains constant

c) The wire is not stretched beyond its elastic limit

d) The weight of wire is negligible

- 23) An oscillating body is at mean position at $t=0$. At $t=T/4$, it will be at (UHS: 2010)
- extreme position
 - mean position
 - between extreme and position
 - beyond extreme position
- 24) In a simple pendulum, the tension of the string is (UHS: 2010)
- $g \cos \theta$
 - $mg \sin \theta$
 - $mg \cos \theta$
 - mg
- 25) If the mass attached with a spring becomes four times, the time period of vibration becomes: (UHS: 2009)
- one fourth
 - $3/4$
 - half
 - double
- 26) In a microwave oven, the wave produced has a wavelength of 12 cm at a frequency of: (UHS: 2009)
- 2452 Hz
 - 2456 Hz
 - 2455 Hz
 - 2450 Hz
- 27) If the mass of the bob of simple pendulum is doubled, its time period is: (UHS: 2008)
- halved
 - doubled
 - unchanged
 - increases four times
- 28) The angular frequency of simple pendulum is directly proportional to (UHS: 2008)
- ℓ
 - $1/\ell$
 - $\sqrt{\ell}$
 - $\sqrt{1/\ell}$

6.

WAVES

MDCAT

- 1) A wave travelling with speed of 130 ms^{-1} having wavelength of 5 m. What is the frequency? (UHS: 2017)
- 650 Hz
 - 26 Hz
 - 20 Hz
 - $3.8 \times 10^2 \text{ Hz}$
- 2) A metallic wire of 2 m length hooked between two points has tension of 10N. If mass per unit length is 0.004 kg/m , then fundamental frequency emitted by wire on vibration is (UHS: 2017)
- 48 Hz
 - 12.5 Hz
 - 24 Hz
 - 6.25 Hz
- 3) The red shift measurement of Doppler's effect of galaxies indicate that the universe is (UHS: 2016)
- expanding
 - contracting
 - stationary
 - oscillating
- 4) Frequency audible range to human hearing lies in the range (UHS: 2016)
- (2 - 2000) kHz
 - (20 - 20000) Hz
 - (15 - 50000) Hz
 - (20 - 20000) kHz
- 5) An observer moves with velocity v_0 towards a stationary source, then the number of waves received in one second is: (UHS: 2015)
- $f' = f \left(\frac{v}{v+v_0} \right)$
 - $f' = f \left(\frac{v}{v-v_0} \right)$
 - $f' = f \left(\frac{v+v_0}{v} \right)$
 - $f' = f \left(\frac{v-v_0}{v} \right)$
- 6) The wavelength ' λ ' of a wave depends on the speed ' v ' of the wave and its frequency ' f '. Decide which of the following is correct? (UHS: 2013)
- $f = v\lambda$
 - $f = \lambda/v$
 - $f = v/\lambda$
 - $f = v\lambda^{-2}$
- 7) When the source of sound moves towards the stationary observer, the value of apparent frequency ' f_0 ' is: (UHS: 2012)

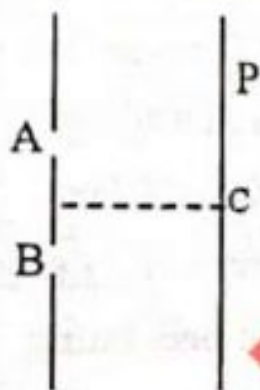
- a) $f_0 = \left(\frac{v+u_0}{v}\right)f$ b) $f_0 = \left(\frac{v}{v-u_0}\right)f$ c) $f_0 = \left(\frac{v}{v+u_0}\right)f$ d) $f_0 = \left(\frac{v-u_0}{v}\right)f$
- 8) A source of sound wave emits waves of frequency 'f'. If 'v' is speed of sound waves, then what will be the wavelength of the waves (UHS: 2011)
- a) $\frac{v}{f}$ b) vf c) $\frac{v-u_0}{f}$ d) $(v-u_0)f$
- 9) The spectrum of a star's light is measured and the wavelength of one of the lines as the sodium's line is found to be 589 nm. The same line has the wavelength of 497 nm when observed in the laboratory. This means the star is (UHS: 2011)
- a) Moving away from the earth b) Moving towards the north
c) stationary d) Revolving around the planet
- 10) An organ pipe closed at one end has a length of 25 cm. Wavelength of the fundamental note is (UHS: 2010)
- a) 25 cm b) 50 cm c) 100 cm d) 75 cm
- 11) The path difference 'BD' for destructive interference is (UHS: 2010)
- a) $\left(m + \frac{1}{2}\right)\lambda$ b) $m\lambda$ c) $d\sin\theta$ d) 3λ
- 12) A 2m long pipe is open at both ends. What is its harmonic frequency? (UHS: 2008)
- a) 42.5 Hz b) 85 Hz c) 220 Hz d) none of these



LIGHT

MDCAT

- 1) Coherent light emerge from two fine parallel slit 'A' and 'B' as shown in figure (UHS: 2017)



$$\phi = \frac{2\pi}{\lambda} P.d$$

$$\phi = \frac{2\pi}{\lambda} \left(\frac{m + \frac{1}{2}}{\frac{2m+1}{2}} \right) \lambda$$

if 'P' is the position of n^{th} dark fringe from center of interference, then phase difference between wave train from 'A' and 'B' (UHS: 2017)

- a) $n\pi$ radian **b) $\left(n + \frac{1}{2}\right)\pi$ radian** c) $2n\pi$ radian d) $(2n + 1)\pi$ radian
- 2) the wavelength of light which produces second order spectrum on diffraction grating on which 5000 lines/cm are ruled at an angle of 30° will be equal to (UHS: 2017)
- a) 6×10^{-7} m b) 5×10^{-7} m c) 4×10^{-6} m d) 3×10^{-6} m
- 3) In general, equation for destructive interference is given by ; $p.d = \left(m + \frac{1}{2}\right)\lambda$
Where m is an integer, then 1st dark fringe appears when 'm' will be equal to: (UHS: 2016)
- a) $\frac{2}{3}$ b) $\frac{1}{2}$ **c) 0** d) 1

- 1) For bright fringe formation, the path difference is: (UHS: 2016)
- $(n + \frac{1}{2})\lambda$, where $n = 0, 1, 2, \dots$
 - $n\lambda$, where $n = 0, 1, 2, \dots$
 - $(2n + 1)\frac{\lambda}{2}$, where $n = 0, 1, 2, \dots$
 - $(\frac{n+1}{2})\lambda$, where $n = 0, 1, 2, \dots$
- 2) The distance between two dark adjacent fringes is mathematically written as: (UHS: 2015)
- $\Delta y = \frac{\lambda L}{d}$
 - $\Delta y = \frac{\lambda}{dL}$
 - $\Delta y = \frac{\lambda d}{L}$
 - $\Delta y = \frac{d}{\lambda L}$
- 3) In YDSE, slit separation $x = 0.05$ cm, distance between slit and screen $D = 200$ cm, fringes separation $x = 0.13$ cm, then the wavelength ' λ ' of the light is (UHS: 2015)
- $\lambda = 1.23 \times 10^{-2}$ m
 - $\lambda = 3.25 \times 10^{-7}$ m
 - $\lambda = 4.55 \times 10^{-5}$ m
 - $\lambda = 5.1 \times 10^{-7}$ m
- 4) An oil film floating on water surface exhibits color pattern due to the phenomenon of: (UHS: 2014)
- diffraction
 - polarization
 - interference
 - surface tension
- 5) What is the formula for critical angle in case of light through two mediums having refractive indexes n_1 & n_2 , such that $n_1 > n_2$? (UHS: 2013)
- $\sin^{-1} \frac{n_1}{n_2}$
 - $\cos^{-1} \frac{n_1}{n_2}$
 - $\cos^{-1} \frac{n_2}{n_1}$
 - $\sin^{-1} \frac{n_2}{n_1}$
- 6) The information from one place to another can be transmitted very safely and easily by: (UHS: 2012)
- copper wire
 - Aluminum wire
 - photo diode
 - Optical fibre
- 7) For interference of light waves to take place, the required condition is (UHS: 2011)
- The path difference of the light waves from the two sources must be large
 - The interfering waves must be non-coherent
 - The light waves may come from different sources
 - The light waves may come from two coherent sources
- 8) The property of bending of light around an obstacle and spreading of light waves into geometric shadow of an obstacle is called: (UHS: 2011)
- Diffraction
 - Polarization
 - Quantization of Light
 - Interference of Light
- 9) Which one of following lights travel fastest in optical fibers? (UHS: 2008, 2010)
- visible light
 - ultraviolet light
 - ordinary light
 - infrared light
- 10) In young's double slit experiment, if the distance between slits and screen is doubled, then fringe spacing becomes: (UHS: 2009)
- half of the original value
 - one
 - Doubles of original value
 - zero
- 11) The information received at the other end of fiber can be in-accurate due to _____ of the light signal. (UHS: 2009)
- longer wavelengths
 - frequency
 - intensity
 - dispersion or spreading
- 12) A single mode step index fiber has core of about _____ μm diameter (UHS: 2008)
- 50 - 1000
 - 50
 - 30
 - 5
- 13) A yellow light of wavelength 500 nm emitted by a single source passes through two narrow slits 1mm apart. How far apart are the two adjacent bright fringes when interference is observed on a screen 10m away? (UHS: 2008)
- 5 mm
 - 1.33 mm
 - 0.5 mm
 - 50 mm

HEAT AND THERMODYNAMICS

MDCAT

- 1) Estimate pressure of air molecules at 273 K, if mean square speed is $500 \text{ m}^2\text{s}^{-2}$ and density of air is 6 kgm^{-3} (UHS: 2017)
 - a) $1 \times 10^3 \text{ Pa}$
 - b) $1 \times 10^2 \text{ Pa}$
 - c) $2.50 \times 10^2 \text{ Pa}$
 - d) $2.70 \times 10^3 \text{ Pa}$
- 2) one mole of a gas occupies volume $1 \times 10^{-2} \text{ m}^3$ in cylinder whose pressure is equal to $2.50 \times 10^5 \text{ Pa}$, the temperature of the cylinder is (UHS: 2017)
 - a) 227 K
 - b) 370 K
 - c) 300 K
 - d) 390 K
- 3) the value of pressure and volume of fixed mass of gas in thermometer at triple point of water are $P_{tr} = 1 \times 10^5 \text{ Pa}$ and volume $V_{tr} = 1 \times 10^{-3} \text{ m}^3$. When $P = 1 \times 10^5 \text{ Pa}$ and its volume $V = 1.2 \times 10^{-3} \text{ m}^3$, then temperature of gas is (UHS: 2017)
 - a) 361 K
 - b) 298 K
 - c) 373 K
 - d) 250 K
- 4) The relation $\frac{R}{N_A} = 1.38 \times 10^{-23} \text{ J/K}$ is known as (UHS: 2016)
 - a) Avogadro's constant
 - b) Newton's constant
 - c) Charles constant
 - d) Boltzman's constant
- 5) The relation $PV = nRT$ shows which law of physics? (UHS: 2016)
 - a) Charles law
 - b) Newton's law
 - c) Avogadro's law
 - d) ideal gas law
- 6) The rapid escape of air from burst tyre is an example of: (UHS: 2016)
 - a) adiabatic process
 - b) cooling process
 - c) isothermal process
 - d) 1st law of thermodynamics
- 7) Two sample of gases '1' & '2' are taken at same temperature and pressure but the ratio of their volume is $V_1:V_2 = 2:3$. What is the ratio of no. of moles of gas sample? (UHS: 2015)
 - a) 3:2
 - b) $\sqrt{2}:\sqrt{3}$
 - c) 4:9
 - d) 2:3
- 8) Root mean square velocity of a gas having pressure 'P' and density 'ρ' is given by: (UHS: 2015)
 - a) $\sqrt{\frac{3P}{\rho}}$
 - b) $\frac{3P}{\rho}$
 - c) $\sqrt{\frac{3\rho}{P}}$
 - d) $\frac{3\rho}{P}$
- 9) When the rate of gas changes without change in temperature, the gas is said to undergo: (UHS: 2015)
 - a) isothermal process
 - b) adiabatic process
 - c) isochoric process
 - d) isobaric process
- 10) What is the 273 K on the Celsius scale of temperature? (UHS: 2015)
 - a) 0.15°C
 - b) 273.15°C
 - c) -0.15°C
 - d) -273.15°C
- 11) If heat Q_1 is absorbed at temperature 'T' and heat Q_2 is absorbed at temp of triple point of water, then unknown temperature of system (in K) is: (UHS: 2015)
 - a) 273.16
 - b) $273.16 \frac{Q_1}{Q_2}$
 - c) $273.16 Q$
 - d) $273.16 \frac{Q_1}{Q_2}$
- 12) A gas containing 'N' no. of molecules of a gas having mass of each molecule 'm' is in a cubic container having length of each side 'a'. What is the density of gas contained in cube? (UHS: 2014)
 - a) N/a^2
 - b) Nm/a^3
 - c) m/a^3
 - d) Na^3/m

In general gas equation ' $PV = nRT$ ', n represents the number of moles of gas. Which of following represents the relation of ' n '? (UHS: 2014)

- a) $n = NN_A$ b) $n = N/N_A$ c) $n = N_A/N$ d) $n = N + N_A$

At triple point of water, the pressure of gas is 2680 Pa. By changing ' T ' the pressure increases to 4870 Pa. Then ' T ' is: (UHS: 2014)

- a) 496.38 K b) 438.96 K c) zero d) 496.38°F

The relation between Celsius and Fahrenheit scales is: $\frac{C}{100} = \frac{F-32}{180}$

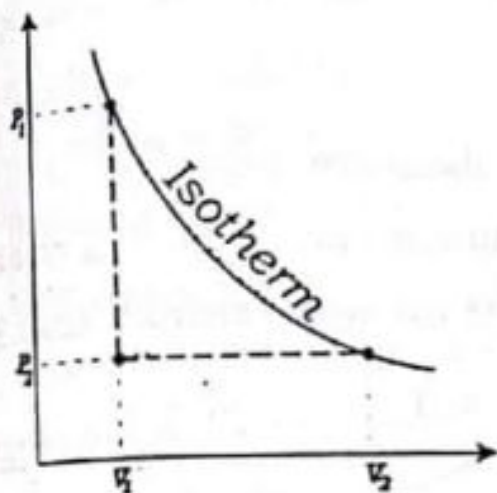
At what temperature both scales give the same reading? (UHS: 2014)

- a) -100° b) -40° c) -180° d) -273°

A gas sample contains three molecules each having speed 1 ms^{-1} , 2 ms^{-1} , 3 ms^{-1} . What is the mean square speed? (UHS: 2013)

- a) $14/3 \text{ ms}^{-1}$ b) 6 ms^{-1} c) 2 ms^{-1} d) $\sqrt{14/3} \text{ ms}^{-1}$

What will be the mathematical form of first law of thermodynamics for a system whose variation of volume by pressure is shown? (UHS: 2013, 2016)



- a) $Q = U$ b) $U = W$ c) $Q = U / W$ d) $Q = W$

What is the factor upon which change in internal energy of an ideal gas depends? (UHS: 2013)

- a) change in volume b) change in temperature and volume
c) change in temperature d) path followed

H_2 and O_2 both are at thermal equilibrium at temperature 300K. Oxygen molecule is 16 times massive than hydrogen. Root mean square speed of hydrogen is (UHS: 2012)

- a) 4 root mean square of oxygen b) $1/4$ root mean square of oxygen
c) $1/16$ root mean square of oxygen d) $1/6$ root mean square of oxygen

Which of the following is expression of mean square speed of ' N ' gas molecules contained in a cylinder? (UHS: 2012)

- a) $\frac{V_1 + V_2 + \dots + V_N}{N}$ b) $\frac{V_1^2 + V_2^2 + \dots + V_N^2}{N}$ c) $\sqrt{\frac{V_1 + V_2 + \dots + V_N}{N}}$ d) $\sqrt{\frac{V_1^2 + V_2^2 + \dots + V_N^2}{N}}$

If ' Q ' is the amount of heat supplied to a system and ' W ' is the work done, then change in internal energy can be defined as (UHS: 2012)

- a) Q/W b) $Q - W$ c) W/Q d) $1 + Q/W$

1st law of thermodynamics under adiabatic conditions can be written as: (UHS: 2012, 2009)



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a) $Q = W$

b) $Q = \Delta U$

c) $Q = U + W$

d) $W = -\Delta U$

23) Which of the following is the expression of root mean square speed of a gas having n number of molecules contained in the container? (UHS: 2011)

a) $\sqrt{\frac{v_1^2 + v_2^2 + \dots + v_x^2}{N}}$

b) $\frac{v_1^2 + v_2^2 + \dots + v_x^2}{N}$

c) $\sqrt{\frac{v_1 + v_2 + \dots + v_x}{N}}$

d) $\frac{v_1 + v_2 + \dots + v_x}{N}$

24) For a gas of volume V in its equilibrium state, if the pressure does change with time then total kinetic energy of gas is constant because (UHS: 2011)

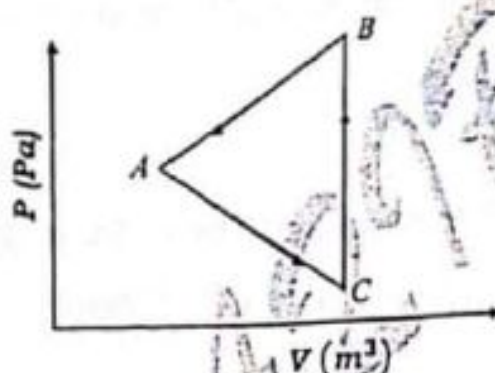
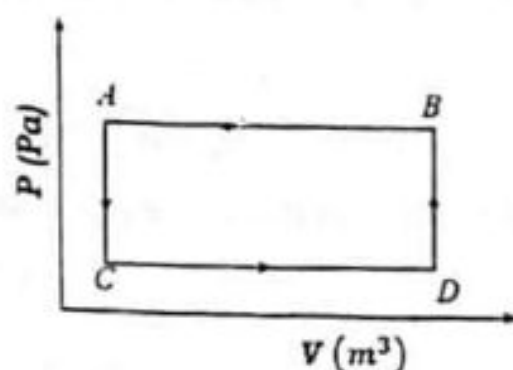
a) Collisions between gas molecules occur

b) Collisions between gas molecules occur linearly

c) Collisions must be elastic

d) Collisions must be inelastic

25) In which of the following, the change in internal energy is more? (UHS: 2011)



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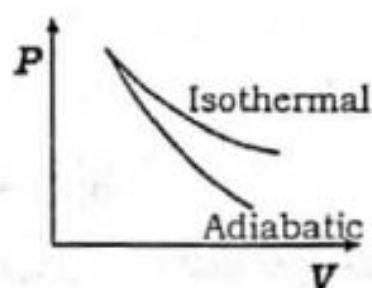
a) In system A

b) In system B

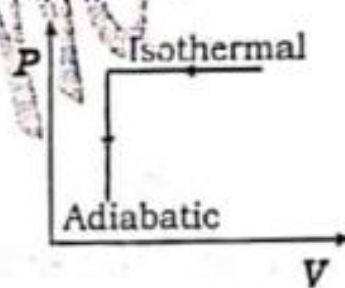
c) Cannot be predicted

d) Change is zero in both. (both are cyclic)

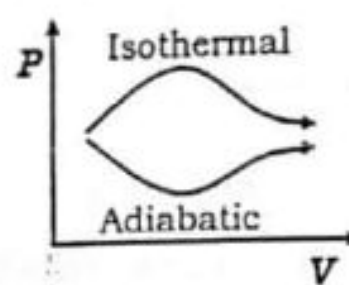
26) Pressure volume graph of two systems 'A' and 'B' are plotted under isothermal and adiabatic conditions. Which of the following observation of graph represents the two systems? (UHS: 2011)



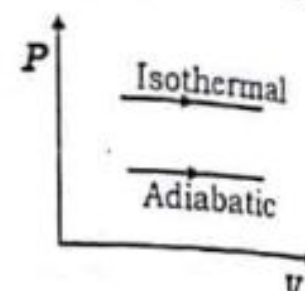
a)



b)

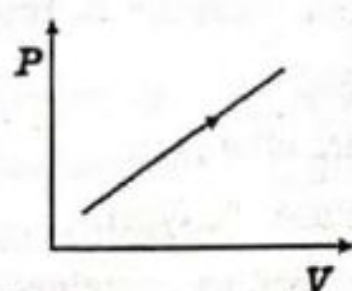


c)

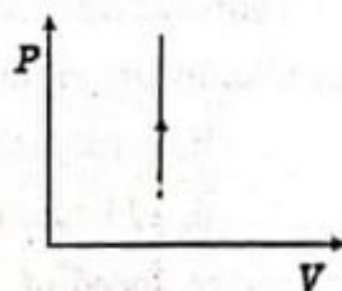


d)

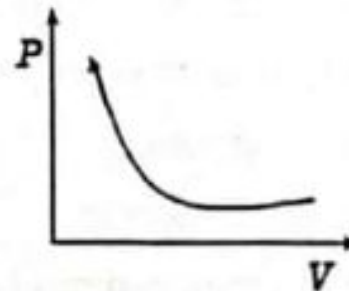
27) Which of the following curve is an isotherm? (UHS: 2011)



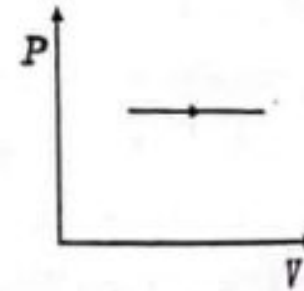
a)



b)



c)



d)

28) The value of universal constant is (UHS: 2008, 2010, 2013)

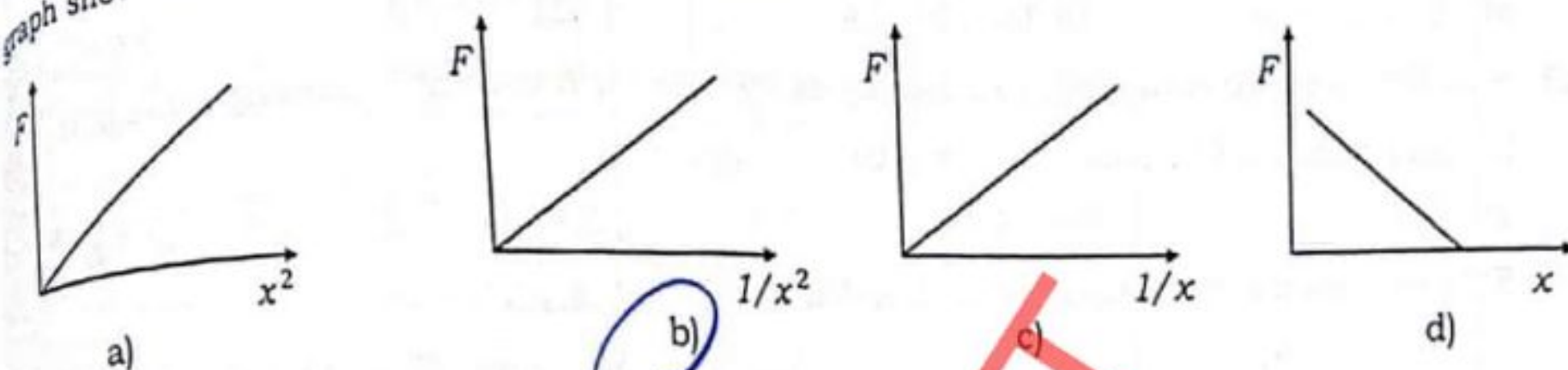
a) $8.314 \text{ J mol}^{-1} \text{ K}^{-1}$

b) $8.324 \text{ J mol}^{-1} \text{ K}^{-1}$

c) $7.23 \text{ J mol}^{-1} \text{ K}^{-1}$

d) $1.00 \text{ J mol}^{-1} \text{ K}^{-1}$

A point charge at distance 'x' from another point charge experience force F of repulsion, which graph shows relationship of force F to 'x' (UHS: 2017)



The coulombs force between two charges $q_1 = 2 \text{ C}$ and q_2 is 2 N , where distance between them is 3 m , the charge q_2 is (UHS: 2017)

- a) $1 \times 10^{-9} \text{ C}$ b) $2 \times 10^9 \text{ C}$ c) $1 \times 10^9 \text{ C}$ d) $4 \times 10^{-9} \text{ C}$

electric field strength at position vector $r = (4\hat{i} + 3\hat{j}) \text{ m}$ caused by point charge $5 \mu\text{C}$ placed at origin is (UHS: 2017)

- a) $(1440\hat{i} + 1080\hat{j}) \text{ V/m}$ b) $(1440\hat{i} + 1080\hat{j}) \text{ N/m}$ c) $(1240\hat{i} + 1280\hat{j}) \text{ N/C}$ d) $(1240\hat{i} + 1080\hat{j}) \text{ N/C}$

If the length, width and separation between the plates of parallel plate capacitor is doubled, then its capacitance becomes: (UHS: 2016)

- a) double b) four times c) eight times d) half

The difference between the plates of a parallel plate capacitor is 2.0 mm and area of each plate is 2.0 m^2 . The plates are in a vacuum. A potential difference of $1.0 \times 10^4 \text{ V}$ is applied across the plates. Find the capacitance. (UHS: 2014)

- a) $4 \times 10^{-3} \text{ F}$ b) $3.54 \times 10^{-9} \text{ F}$ c) $8.85 \times 10^{-9} \text{ F}$ d) $9.0 \times 10^{-9} \text{ F}$

What is the charge stored on a $5 \mu\text{F}$ capacitor charged to potential difference of 12 V ? (UHS: 2013)

- a) $60 \mu\text{C}$ b) 2.4 C c) $2.4 \mu\text{C}$ d) 60 C

What will be the effect on the capacitance of a capacitor if area of each plate is doubled while separation between the plates is halved? (UHS: 2012)

- a) Capacitance remains same b) Capacitance becomes double
 c) Capacitance becomes four times d) Capacitance reduces to half

10 V potential difference is applied across the plate of $1 \mu\text{F}$ capacitor. What is the energy stored in capacitor? (UHS: 2012)

- a) 0.5 mJ b) 0.05 mJ c) 5 mJ d) 50 mJ

The electrical analogue of mass in electricity is (UHS: 2010)

- a) capacitance b) inductance c) charge d) resistance

A particle carrying a charge of $2e$ falls through a potential difference of 3.0 V . calculate the energy acquired by it (UHS: 2009)

- a) $9.6 \times 10^{-19} \text{ J}$ b) $9.1 \times 10^{-19} \text{ J}$ c) $1.6 \times 10^{-19} \text{ J}$ d) $6.0 \times 10^{-19} \text{ J}$

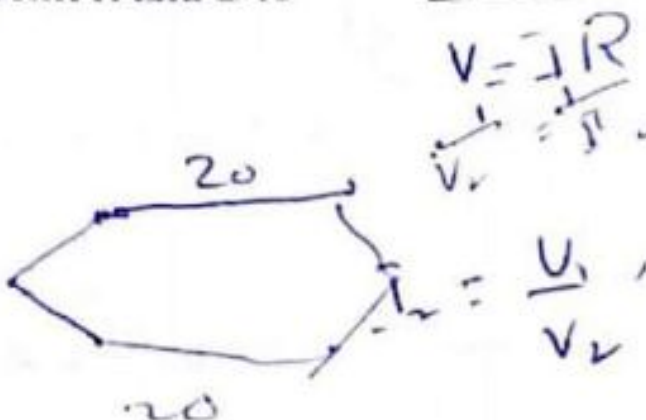
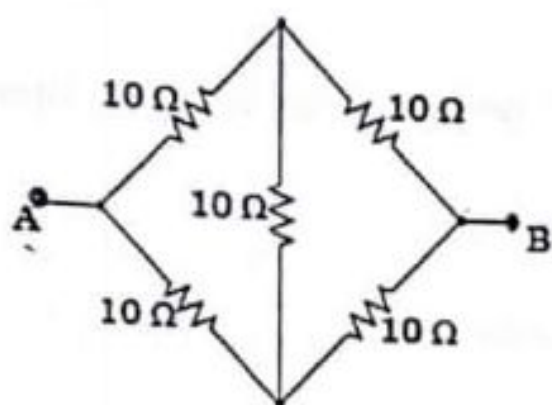
- 1) $2 \times 10^6 \bar{e}$, passing through a conductor in one millisecond. Electric current through conduct (UHS: 2017)

a) $3.20 \times 10^{-10} \text{ A}$ b) $320 \times 10^{-10} \text{ A}$ c) $32.0 \times 10^{-9} \text{ A}$ d) $0.32 \times 10^{-10} \text{ A}$

- 2) A carbon resistor connected to a battery of 50 V and 2 A current is passing through it. If voltage is increased to 75 V, the current will be (UHS: 2017) $V_1 = 50 \text{ V}$ $V_2 = 75 \text{ V}$

a) 1.5 A b) 4.5 A c) 3 A d) 6 A

- 3) Effective resistance between point A and B is (UHS: 2017)



$$V = IR$$

$$\frac{V_1}{V_2} = \frac{I_1}{I_2}$$



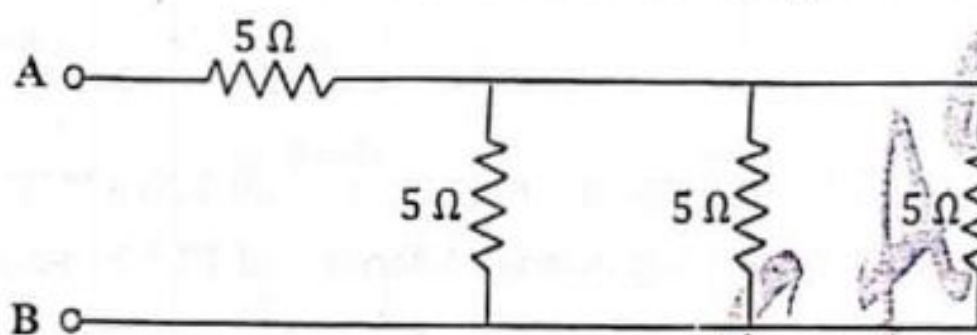
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a) 40Ω b) 10Ω c) 50Ω d) 30Ω

- 4) Resistance between two opposite faces of square thin film of area 1 mm^2 having thickness of $1 \mu\text{m}$, if resistivity of material is $10^{-6} \Omega$ will be: (UHS: 2016)

a) 1000Ω b) 100Ω c) 1Ω d) 10Ω

- 5) Total resistance between 'A' and 'B' in the given circuit is: (UHS: 2016)



a) 5.6Ω b) 3.33Ω c) 0.33Ω d) 6.6Ω

- 6) Which combination of seven identical resistors each of 2Ω gives rise to resultant of $10/11 \Omega$? (UHS: 2015)

a) 5 parallel, 2 series b) 4 parallel, 3 series c) 3 parallel, 4 series d) 2 parallel, 5 series

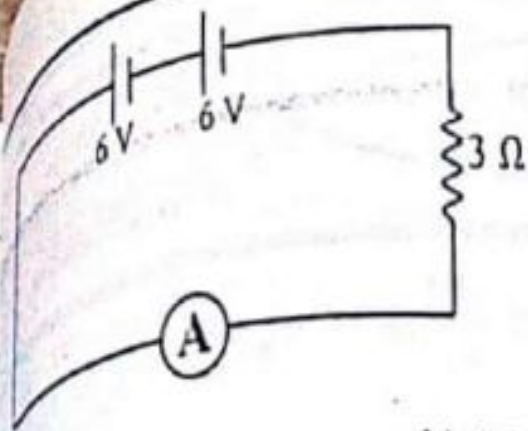
- 7) If a resistor having resistance 'R' is cut into three equal parts, then the equivalent of parallel combination is: (UHS: 2015)

a) $6/R$ b) $3/R$ c) $R/9$ d) $R/3$

- 8) The resistance of a piece of wire is 12Ω . It is bent to form an equilateral triangle. What is the equivalent resistance between any two corners of the triangle? (UHS: 2015)

a) 1.3Ω b) 2.0Ω c) 4.0Ω d) 2.7Ω

- 9) What is the reading of ammeter as shown in the circuit diagram? (UHS: 2014)

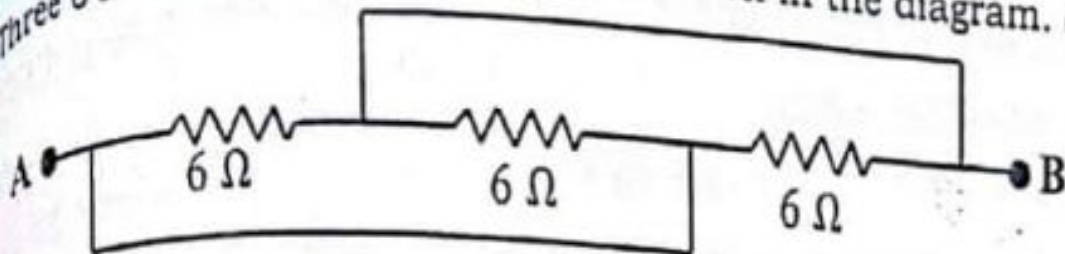


b) 15 A

c) 5 A

d) 10 A

Three $6\ \Omega$ resistors are connected as shown in the diagram. (UHS: 2014)



What is the resistance between points 'A' and 'B'?

a) $6\ \Omega$

b) $16\ \Omega$

c) $4\ \Omega$

d) $2\ \Omega$

1) 12-volt battery is applied across $6\ \Omega$ resistance to have a steady flow of current. What must be the required potential difference across the same resistance to have a steady current of 1 A? (UHS: 2013)

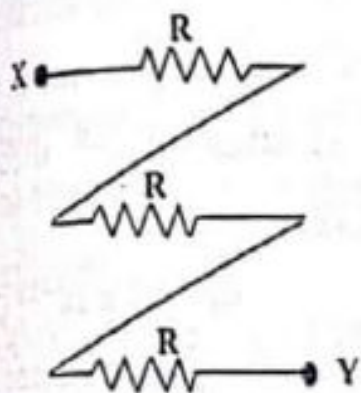
a) 12 V

b) 6 V

c) 1 V

d) 3 V

2) Three resistors each having value 'R' are connected as shown in figure. What is the equivalent resistor between 'x' and 'y'? (UHS: 2013, 2011)



a) R

b) $R/3$

c) $3R$

d) R^3

3) If 2A current passes through a resistor when connected to a certain battery. If the resistance is replaced by the double resistance, then the current will become (UHS: 2011)

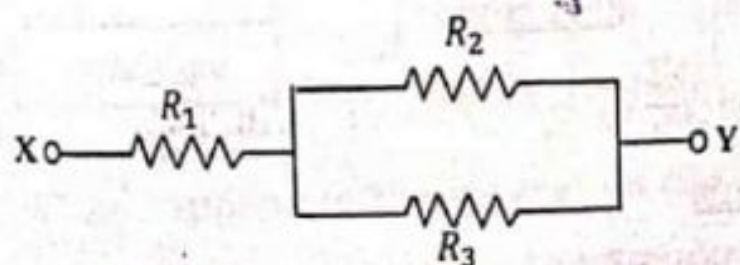
a) 2A

b) 4A

c) 6A

d) 1A

4) Three resistors of resistance R_1 , R_2 & R_3 are connected as shown in figure. Equivalence resistance is: (UHS: 2011)



a) $R_1 + R_2 + R_3$

b) $\frac{R_1 + R_2 + R_3}{R_1 R_2}$

c) $\frac{R_1 R_2 + R_1 R_3 + R_2 R_3}{R_1 + R_2}$

d) $\frac{R_1 R_2 R_3}{R_1 R_2}$

5) If 'V' is the applied p.d across a resistance 'R', then loss in PE per unit time is (UHS: 2010)

a) VI

b) $I^2 R$

c) $\frac{V^2}{R}$

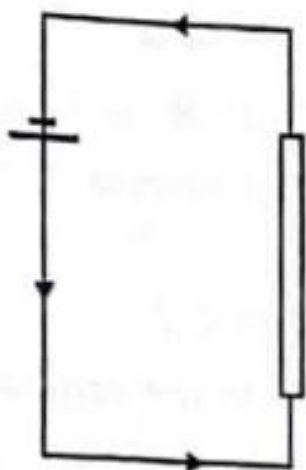
d) All of these



ELECTROMAGNETISM

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- 1) The magnetic flux linked with solenoid of area 'A', having N turns at right angle to magnetic field is (UHS: 2017)
a) NBA b) $\frac{1}{2}$ NBA c) BA d) $BA \cos \theta$
- 2) A loop of 5 turns of wire is placed in uniform magnetic field of 0.5T, then area of loop shrinks at constant rate $10 \text{ m}^2/\text{s}$, emf induced is (UHS: 2017)
a) 2.5 V b) 250 V c) 25 V d) 0.25 V
- 3) Electric current flowing through conductor as shown in figure, what will be direction of magnetic lines of force (UHS: 2017)



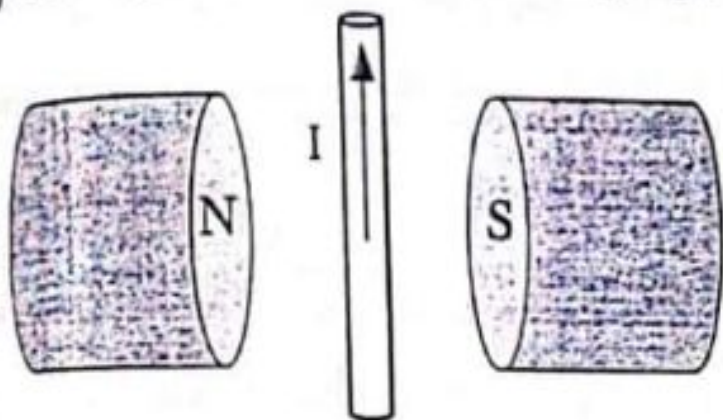
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$$F = qVB \sin \theta$$
$$\frac{2.78 \times 10^{17}}{10 \times} = \frac{1}{\sqrt{2}}$$

- a) Clockwise b) anti-clock wise c) from top to bottom d) from bottom to top
- 4) The charge projected with velocity of 10 m/s in magnetic field of 10T at angle of 60° , if force exerted on charge is $2.78 \times 10^{17} \text{ N}$, then the value of charge is (UHS: 2017)
a) $1.60 \times 10^{-19} \text{ C}$ b) $3.20 \times 10^{-19} \text{ C}$ c) $2.70 \times 10^{-19} \text{ C}$ d) $4.80 \times 10^{-19} \text{ C}$
- 5) 'F' is the maximum force acting on a conductor. Now if we change the direction of conductor by making an angle of 45° with the magnetic field then the force becomes: (UHS: 2016)
a) $F/2$ b) $2F$ c) $\frac{F}{\sqrt{2}}$ d) $\sqrt{2} F$
- 6) If we double the parameters of the force acting on current carrying conductor and $\theta = 90^\circ$, then magnetic force becomes (UHS: 2016)
a) half b) double c) eight times d) four times
- 7) If electrons of charge 'e' moving with velocity 'v' are accelerated through a potential difference 'V' and strike a metal target, then velocity of electrons is: (UHS: 2015)
a) $\frac{Ve}{m}$ b) $\sqrt{\frac{Ve}{2m}}$ c) $\sqrt{\frac{Ve}{m}}$ d) $\sqrt{\frac{2Ve}{m}}$
- 8) Magnetic field strength is measured in (UHS: 2015)
a) wb m^{-1} b) wb m^{-2} c) wb m^2 d) wb
- 9) Force on current carrying conductor per unit length is given by: (UHS: 2015)
a) $IL \sin \theta$ b) ILB c) IL d) $IB \sin \theta$
- 10) A solenoid 15 cm long has 300 turns of wire. A current of 5 A flows through it. What is the

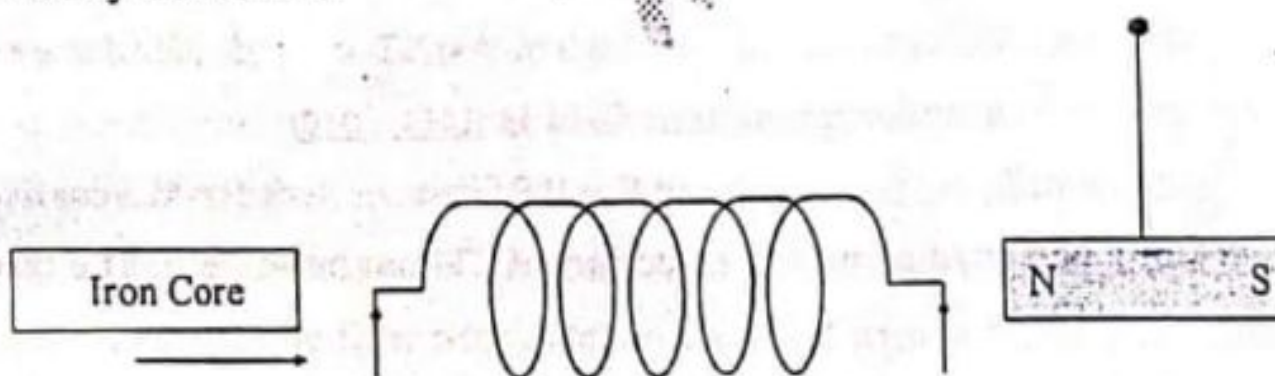
magnitude of magnetic field inside the solenoid. (UHS: 2014)

- a) $75 \times 10^7 \text{ T}$ b) $60 \times 10^3 \text{ T}$ c) $4\pi \times 10^{-3} \text{ T}$ d) $750\pi \times 10^3 \text{ T}$
- 11) Due to current in a straight conductor the difference between magnetic field lines (UHS: 2014)
- a) increases away from conductor
b) decreases away from conductor
c) increases towards conductor
d) decreases and then increases towards conductor
- 12) A solenoid is cut into two halves. Magnetic induction due to same current in each half will be: (UHS: 2013)
- a) half of original
b) double of the original
c) same as original
d) four times of the original
- 13) A long straight current carrying conductor has current directed from bottom to top when held vertically. What will be the direction of magnetic field lines when observed from below the conductor? (UHS: 2013)
- a) clockwise b) anti clockwise c) vertically upward d) vertically downward
- 4) The diagram shows a wire carrying current I , placed between the poles of magnet:



In which direction, does the force on wire acts? (UHS: 2011, 2013)

- a) towards the 'N' pole of magnet b) downwards
c) upwards d) towards the 'S' pole of magnet
- 5) A 10 cm long solenoid has 100 turns. What will be the magnetic field inside it along its axis if one micro ampere current is passed through it? (UHS: 2012)
- a) $4\pi \times 10^{-13} \text{ tesla}$ b) $4\pi \times 10^{-7} \text{ tesla}$ c) $4\pi \times 10^{-10} \text{ tesla}$ d) $4\pi \times 10^{-16} \text{ tesla}$
- 6) The diagram shows a small magnet hanging on a thread near the end of a solenoid carrying a steady current I :



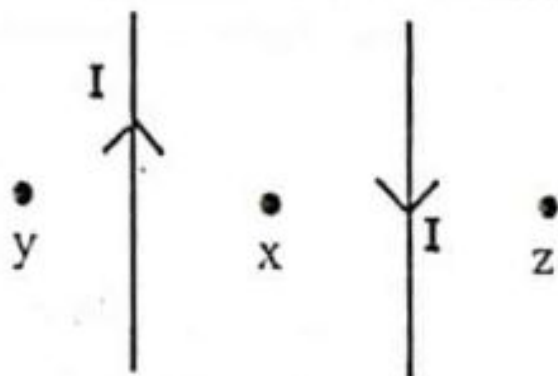
What happens to the magnet as the iron core is inserted into the solenoid? (UHS: 2012)

- a) It moves towards solenoid and rotates through 180° b) It moves towards the solenoid
c) It moves away from solenoid d) It moves away from solenoid and rotates through 180°
- 17) Two long straight parallel wires held vertically have equal but opposite currents as shown in the figure: (UHS: 2012)

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Which of the following effect will be observed?

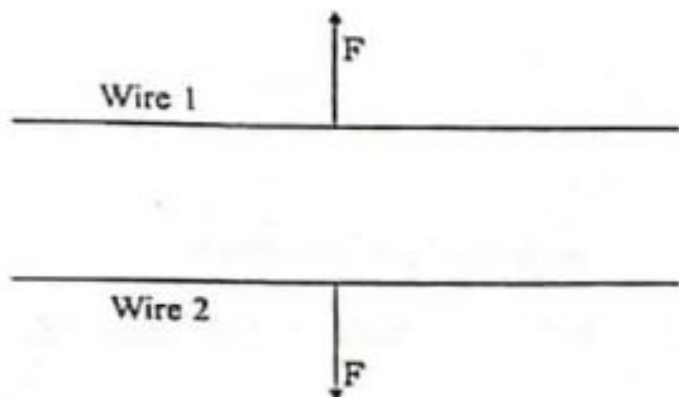
- a) Magnetic field at 'X' is stronger than that at 'Y' and 'Z'
- b) Magnetic field at 'X' is weaker than that at 'Y' and 'Z'
- c) Magnetic field at 'X', 'Y' and 'Z' is same
- d) Magnetic field at 'X' is weaker than that at 'Y' but stronger than that at 'Z'



18) If the number of turns of a solenoid circular coil is doubled, but the current in the coil and radius of the coil remains same, then what will be the magnetic flux density produced by the coil? (UHS: 2011)

- a) Magnetic flux density will be halved
- b) Magnetic flux density remains unchanged
- c) Magnetic flux density increases by different amount at different points
- d) Magnetic flux density will be doubled

19) Two long parallel wires Wire 1 and Wire 2 repel each other as shown in the figure. What could be the reasons? (UHS: 2011)



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- a) Both carry current in same direction
- b) Both carry current in opposite direction
- c) Wire 1 has current, but Wire 2 has no current
- d) Wire 2 has current, Wire 1 has no current

20) Which one of following is correct? (UHS: 2010)

- a) $1 \text{ wb m}^{-2} = \text{N m}^{-1} \text{A}^{-1}$
- b) $1 \text{ T} = 10^4 \text{ Gauss}$
- c) $1 \text{ wb m}^{-2} = 1 \text{ T}$
- d) All of these

21) Force on a current carrying conductor in a uniform magnetic field is (UHS: 2010)

- a) $F = NIA \cos \alpha$
- b) $F = \mu NI$
- c) $F = ILB \sin \alpha$
- d) $F = ILA \cos \alpha$

22) A charge of $2\mu\text{C}$ moves with velocity of 2 m/s along the direction of 2 T magnetic field. The force acting on it will be (UHS: 2008)

- a) 2 N
- b) zero
- c) 8 N
- d) 4 N

23) An electric charge in uniform motion produces: (UHS: 2008)

- a) electric field
- b) magnetic field
- c) both magnetic & electric field
- d) neither magnetic nor electric fields

Electromagnetic Induction

MDCAT

The value of magnetic flux is 10 wb, then magnetic lines of forces containing magnetic field strength of 1 T passing through unit area of 10m^2 then angle b/w magnetic field and unit area is: (UHS: 2017)

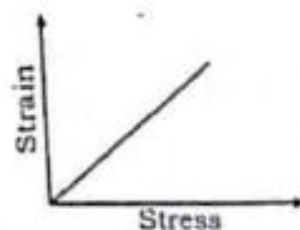
- a) 360° b) 90° c) 180° d) 45°
- The phase at negative peak of AC voltage is: (UHS: 2017)
- a) $\frac{\pi}{2}$ b) $\frac{3\pi}{2}$ c) π d) $\frac{2\pi}{3}$
- The lenz's law refers to induced _____ (UHS: 2008)
- a) emf b) resistance c) current d) shear
- In a step down transformer, the output current _____ (UHS: 2008)
- a) is reduced b) is increased c) remains same d) none of these

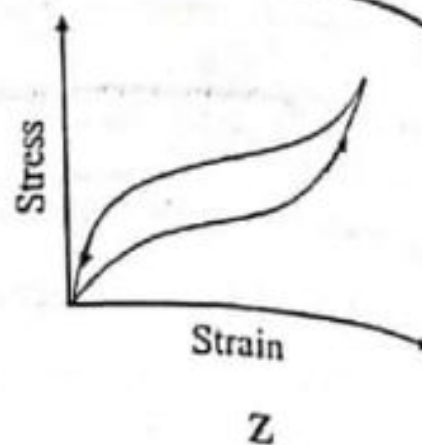
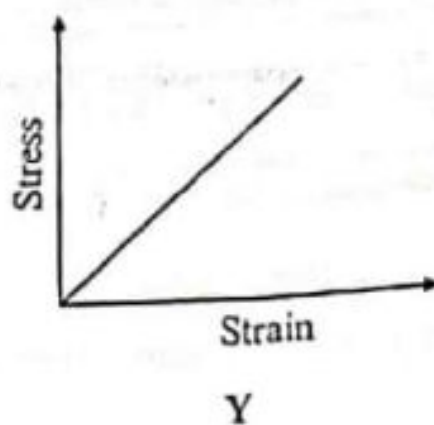
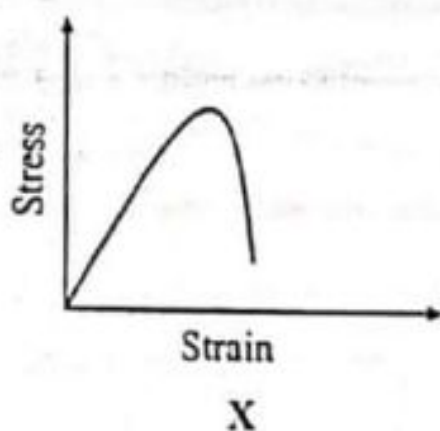
13.

DEFORMATION OF SOLIDS

MDCAT

- 1) A 1.25 cm diameter cylinder is subjected to load of 2500 kg, stress on bar is: (UHS: 2017)
- a) 200 Pa b) 2×10^3 Pa c) 2×10^5 Pa d) 2×10^8 Pa
- 2) A wire of length 2 m is attached with mass of 2 kg vertically, tensile strain of wire is 0.3×10^{-3} the extension in wire is (UHS: 2017)
- a) 1.5 mm b) 0.15 mm c) 2 mm d) 0.6 mm
- 3) The ratio of applied stress to volumetric strain is called: (UHS: 2016)
- a) bulk modulus b) tensile modulus c) young's modulus d) shear modulus
- 4) The wire made of copper belong to which specific kind of material? (UHS: 2016)
- a) ductile material b) brittle material c) tough material d) deformed material
- 5) Strain energy in a deformed material is stored in the form of (UHS: 2015)
- a) elastic energy b) potential energy c) plastic energy d) kinetic energy
- 6) A wire of area of cross section 'A' and original length 'L' is subjected to a load 'L'. A second wire of same material with an area '2A' and length '2L' is subjected to the same load 'L'. If the extension in the first wire is 'x' and second wire is 'y', find the ration 'x/y' (UHS: 2015)
- a) $1/4$ b) $1/2$ c) $1/1$ d) $2/1$
- 7) Which feature of the following graph represents Young's modulus? (UHS: 2014)
- a) area under graph b) gradient of graph
- c) reciprocal of the gradient d) product of gradient and area of the curve
- 8) Three graphs for three types of materials are shown in figure. (UHS: 2014)



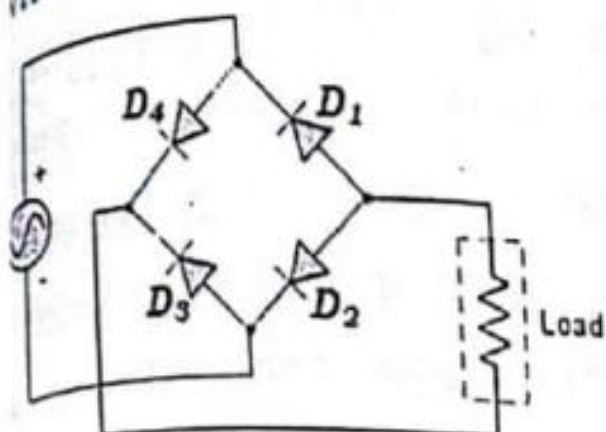


Which row describes the correct material?

	X	Y	Z
a)	Brittle	Ductile	Polymer
b)	Brittle	Polymer	Ductile
c)	Polymer	Brittle	Ductile
d)	Ductile	Brittle	Polymer

- 9) The stress-strain graph, deduced the following limits successively: (UHS: 2013)
- a) proportional limit, yield limit, elastic limit b) yield limit, elastic limit, proportional limit
- c) proportional limit, elastic limit, yield limit d) elastic limit, proportional limit, yield limit
- 10) A 4.0 m long wire is subjected to stretching force and its length increases by 40 cm. The percent elongation which the wire undergoes is: (UHS: 2013)
- a) 0.01% b) 40% c) 10% d) 20%
- 11) The ratio of tensile strength to tensile strain is called: (UHS: 2012)
- a) Modulus of elasticity b) Bulk Modulus c) Young's Modulus d) Shear Modulus
- 12) A wire is stretched by a force 'F' which causes an extension Δl , the energy stored in the wire is: (UHS: 2012)
- a) $F\Delta l$ b) $2F\Delta l$ c) $\frac{1}{2} F\Delta l^2$ d) $\frac{1}{2} F\Delta l$
- 13) Which statement is correct: (UHS: 2011)
- a) Elasticity is that property of body which enables body to regain its original dimension
- b) Elasticity is that property of a body that does not allow it to return to its original shape
- c) Elasticity is that property of a body that allows it to retain its original shape and dimension after the stress is removed
- d) Elasticity is that property of a body that obeys Hooke's law.
- 14) Which of following is the most ductile? (UHS: 2008)
- a) glass b) copper c) cast iron d) high carbon steel

Output voltage of rectifier is not smooth, it can be made smooth by a circuit known as: (UHS: 2017)
 a) Wheatstone circuit b) filter circuit
 What happens in positive cycle of AC input? (UHS: 2017) c) bridge circuit d) Ripple circuit



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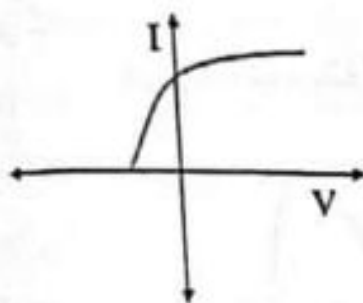
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a) D_1 & D_2 conducts b) D_3 & D_4 conducts c) D_1 & D_3 conducts d) D_2 & D_4 conducts

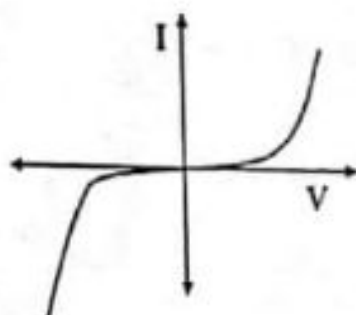
If signal is applied to input of non-inverting amplifier through resistance of $100 \text{ k}\Omega$ and the value of feedback resistance is $10 \text{ k}\Omega$, the gain is:— (UHS: 2017)

a) 11 b) 1:1 c) 10 d) 0.11

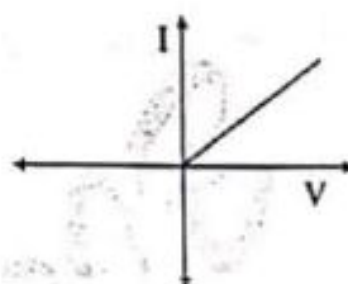
Which one of the following is I-V curve of a junction diode? (UHS: 2012)



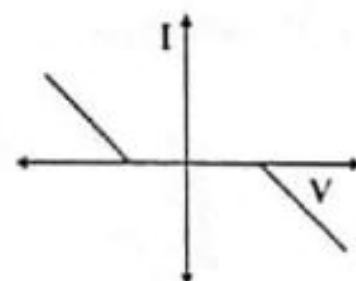
a)



b)



c)



d)

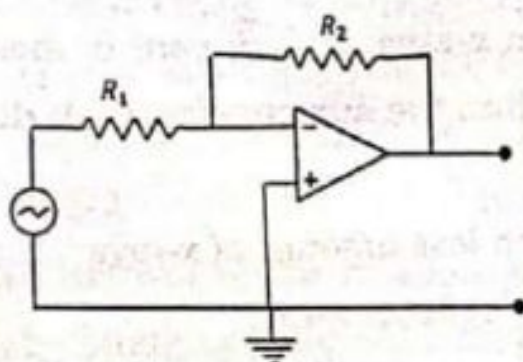
The closed loop gain of op-Amp depends upon: (UHS: 2010)

- a) internal structure of op-Amp b) externally connected resistances
 c) voltage power supplies d) input resistance

A signal that is applied at the inverting input terminal of an OP-AMP undergo amplification at the output terminal with a phase shift of: (UHS: 2009)

- a) 0° b) 270° c) 360° d) 180°

If $R_1 = 10 \text{ k}\Omega$ and $R_2 = 100 \text{ k}\Omega$, then the gain of OP-AMP as inverting Amplifier is: (UHS: 2009)



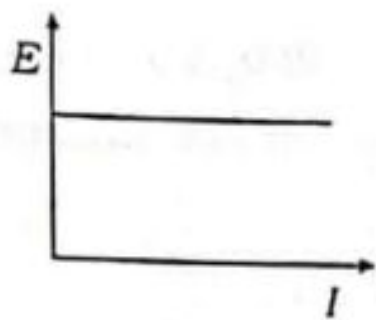
a) -1

b) 10

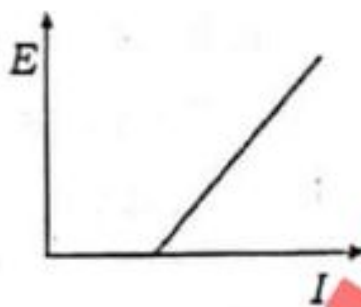
c) -10

d) 1

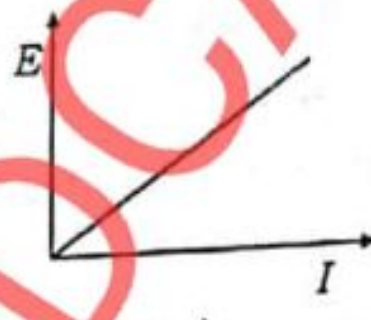
- 1) The frequency of proton having momentum $4.42 \times 10^{-26} \text{ Ns}$ is (UHS: 2017)
 a) $2 \times 10^{16} \text{ Hz}$ b) $5 \times 10^{16} \text{ Hz}$ c) $2 \times 10^{14} \text{ Hz}$ d) $2 \times 10^{18} \text{ Hz}$
- 2) The momentum of wave where wavelength is $1.32 \times 10^{-9} \text{ m}$ (UHS: 2017)
 a) $5 \times 10^{-25} \text{ Ns}$ b) $5 \times 10^{-43} \text{ Ns}$ c) $5 \times 10^{-26} \text{ Ns}$ d) $5 \times 10^{-44} \text{ Ns}$
- 3) Ionization energy of hydrogen atom is (UHS: 2017)
 a) 0.54 eV b) 3.39 eV c) 0.85 eV d) 13.6 eV
- 4) The maximum kinetic energy 'E' of photoelectrons ejected by light of certain wavelength from metal is measured as a function of intensity 'I' of light. Which graph represents the way 'E' depends on 'I' (UHS: 2017)



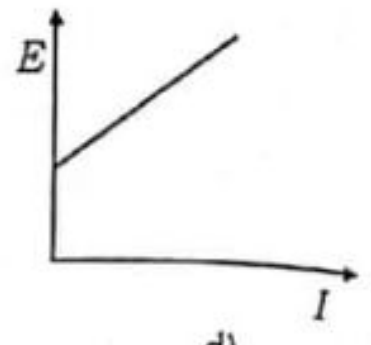
a)



b)

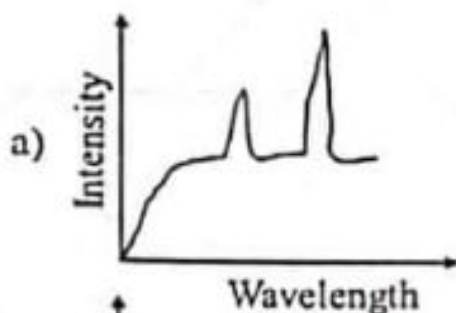


c)

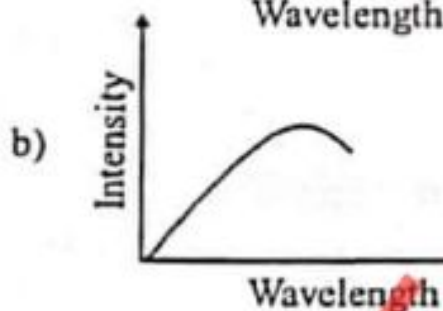


d)

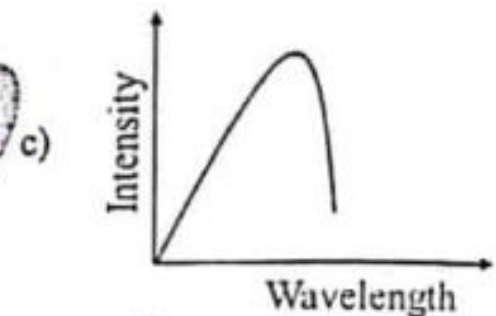
- 5) Which of following graph represents the output of an x-ray? (UHS: 2016, 2015, 2014)



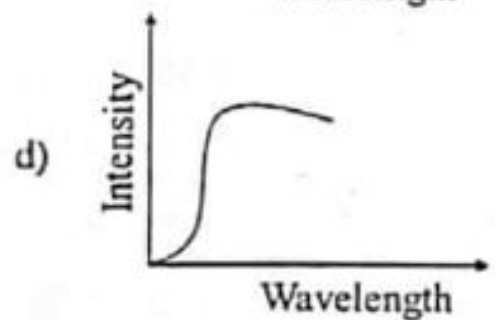
a)



b)



c)



d)

- 5) The continuous spectrum of x-ray is formed due to: (UHS: 2016)
 a) characteristic x-rays b) bremsstrahlung x-rays c) soft x-rays d) hard x-rays
- 7) Wavelength of γ -rays is: (UHS: 2016)
 a) equal to x-rays b) less than x-rays c) greater than x-rays d) none of these
- 3) The shadow of bones in x-ray photographic film appears lighter than the surrounding flesh due to: (UHS: 2016)
 a) bones reflect greater amount of x-rays b) bones absorb less amount of x-rays
 c) bones absorb greater amount of x-rays d) bones totally reflects x-rays
- 9) The target of x-ray tube is made up of which metal? (UHS: 2016)
 a) iron b) nickel c) brass d) tungsten

10) The atom is excited to an energy level E_1 from its ground state energy level E_0 , the wavelength of the radiations emitted is: (UHS: 2016)

- a) $\frac{E_1 - E_0}{hc}$ b) $\frac{E_1 - E_0}{hc}$ c) $\frac{hc}{E_0 - E_1}$ d) $\frac{E_1}{hc} - \frac{E_0}{hc}$

11) The x-rays consist of (UHS: 2016)

- a) high energy protons b) high energy electron c) high energy γ -ray d) high energy photons

12) In an x-ray tube, electrons after being accelerated through velocity ' v ' strike the target. Then the wavelength of emitted x-rays is (UHS: 2015)

- a) not greater than $\frac{hc}{eV}$ b) not less than $\frac{hc}{eV}$ c) equal to $\frac{h}{mv}$ d) equal to $\frac{hc}{eV}$

13) In the case, when the electrons lose all their KE in the first collision, the x-ray photon emitted has which of following set of frequency and wavelength? (UHS: 2015)

- a) $f_{\max}, \lambda_{\min}$ b) $f_{\max}, \lambda_{\max}$ c) $f_{\min}, \lambda_{\max}$ d) $f_{\min}, \lambda_{\min}$

14) If potential difference between target and cathode of an x-ray tube is 20 kV and current is 20 mA. What is the $\lambda_{\min}$ of the emitted x-ray? (UHS: 2015)

- a) 6.19×10^{-4} m b) 6.19×10^{-14} m c) 6.19×10^{-11} m d) 6.19×10^{-19} m

15) Magnetic resonance imaging (MRI) is used to identify the image of (UHS: 2014)

- a) tumors and inflamed tissues b) skin cells c) blood cells d) bone structures

16) Bones absorb greater amount of incident x-rays than flesh. This is because of the fact that (UHS: 2014)

- a) bones lie between the flesh b) bones are light in color
c) bones contain material of low densities d) bones contain material of high densities

17) Which of the following is the practical application of x-rays? (UHS: 2014)

- a) MRI b) ultrasonography c) CAT d) PET

18) Which of following have largest energy content? (UHS: 2014)

- a) γ -rays b) x-rays c) IR radiations d) UV radiations

19) X-ray from a given x-ray tube operating under specified conditions have a minimum wavelength. The value of this minimum wavelength could be reduced by: (UHS: 2013)

- a) cooling the target b) reducing the temperature of the filament
c) increasing the P.d b/w the cathode and the target d) reducing the pressure in the tube

20) What is the type of characteristic x-ray photon, whose energy is given by relation, $hf = E_M - E_K$ (UHS: 2013)

- a) K_α b) M_α c) K_β d) M_β

21) Kinetic energy of electrons by applying potential difference V_1 across the x-ray tube is KE_1 , while V_2 potential difference produce KE equal to KE_2 . What will be the value of $KE_1:KE_2$. If the ratio of potential difference $V_1:V_2 = 2:3$? (UHS: 2013)

- a) 3:2 b) 4:9 c) 9:4 d) 2:3

22) What will be the relation for the speed of electron accelerated towards the target in x-ray tube by applying potential difference V . take mass of electron ' m ' and charge on electron ' e '? (UHS: 2013)

- a) $v = \sqrt{\frac{2Ve}{m}}$ b) $v = \sqrt{\frac{2me}{V}}$ c) $v = \sqrt{\frac{2V}{me}}$ d) $v = \sqrt{2meV}$

- 23) For what CAT stands in x-ray technology? (UHS: 2013)
- capacitor amplifier transistor
 - computerized axial tomography
 - cathode anode technique
 - current amplification technology
- 24) The kinetic energy K.E. with which the electron strikes the target is given by: (UHS: 2012)
- $KE = e^2V$
 - $KE = \frac{hc}{\lambda}$
 - $KE = hf^2$
 - $KE = eV$
- 25) X-rays can be produced by bombardment of _____ on target metal: (UHS: 2012)
- proton
 - electron
 - neutron
 - Alpha particles
- 26) If an electron in the 'K' shell is removed and an electron from 'L' shell jumps to occupy the hole in the 'K' shell, it emits a photon of energy: (UHS: 2012)
- $hf_{K\alpha} = E_L - E_K$
 - $hc = E_L - E_K$
 - $h/\lambda_{K\alpha} = E_L - E_K$
 - $hf_{K\alpha} = E_K - E_L$
- 27) Which of the following property must be there in a substance so that it can be used as target in X-ray tube? (UHS: 2012)
- It must have low melting point
 - It must have low atomic number
 - It must have high reflecting ability
 - It must have high atomic number
- 28) Wavelength of X-rays is the order of: (UHS: 2011)
- 10^{-6} m
 - 10^{-10} m
 - 10^{-13} m
 - 100 m
- 29) When electrons lose all their kinetic energy in the first collision, the entire kinetic energy appears as an X-ray photon of energy: (UHS: 2011)
- K.E = eV
 - $K.E = \frac{h\lambda_{min}}{c}$
 - $K.E = \frac{hc}{\lambda_{min}}$
 - $K.E = \frac{h}{\lambda_{max}}$
- 30) The characteristic X-ray spectrum is due to: (UHS: 2011)
- Absorption of neutrons by target material
 - Bombardment of target material by proton
 - The bombardment of target material by electrons
 - The bombardment of target material by alpha particles
- 31) The minimum frequency below which electrons are emitted from the metal surface is called: (UHS: 2010)
- high frequency
 - low frequency
 - threshold frequency
 - resonance frequency
- 32) Einstein's photoelectric equation is given by: (UHS: 2009)
- $hf = \phi + \frac{1}{2}mv^2$
 - $E = mc^2$
 - $E = hc^2$
 - $hf = \frac{1}{2}mv^2$
- 33) If a particle of mass 5mg moves with the speed of 8 m/s. Then the de-Broglie's wavelength will be: (UHS: 2009)
- 1.68×10^{-27} m
 - 1.70×10^{-25} m
 - 1.65×10^{-29} m
 - 1.66×10^{-29} m
- 34) For atomic hydrogen spectrum, which of the following series in visible region of electromagnetic spectrum? (UHS: 2008)
- Lyman series
 - Paschen series
 - Balmer series
 - Bohr series
- 35) Cesium coated oxidized silver emits electrons for _____ light. (UHS: 2008)
- infra-red
 - ultra-violet
 - visible
 - green

Complete the equation: ${}^Z_Z \rightarrow {}^A_Y + \gamma$. (UHS: 2017)

b) ${}^A_Z$

c) ${}^{A+1}_{Z-1}$

d) ${}^{A+1}_{Z+1}$

The quantity of uranium is 400g, after 3rd half-life, the amount of uranium left: (UHS: 2017)

a) 25 g

b) 100 g

c) 50 g

d) 200 g

The mass of radium atom decreases by 8.60×10^{-3} kg, mass defect equivalent to energy is: (UHS: 2017)

a) 4.48 MeV

b) 3×10^2 MeV

c) 4.84 MeV

d) 4.84×10^{33} eV

Thorium is transformed after the transmission of β -particle into: (UHS: 2016)

a) bismuth

b) polonium

c) protactinium

d) palladium

Emission of γ -rays from radioactive element results into: (UHS: 2016)

a) bismuth

b) polonium

c) protactinium

d) palladium

The relation between decay constant ' λ ' and half-life ' $T_{1/2}$ ' of radioactive substance is: (UHS: 2016)

a) $\lambda = \frac{1}{T_{1/2}}$

b) $\lambda = T_{1/2}$

c) $\lambda = 0.693 T_{1/2}$

d) $\lambda = \frac{0.693}{T_{1/2}}$

In the reaction, ${}^{234}_{92}\text{Th} \rightarrow {}^{234}_{91}\text{Y} + {}^0_{-1}\text{e}$. The electron ${}^0_{-1}\text{e}$ emits from the (UHS: 2015)

a) 1st orbit

b) 2nd orbit

c) nucleus

d) valance shell

According to the equation ${}_Z^AX \rightarrow Y + 3\alpha$. What are the atomic and mass numbers of 'Y'? (UHS: 2015)

a) Z-6, A-12

b) Z-2, A-4

c) Z+1, A

d) Z+3, A

A certain radioactive nuclide of mass number 'x' decays by β -emission and α -emission to a second nuclide of mass number 't'. Which of following correctly related 'x' and 't'? (UHS: 2015)

a) $x = t+4$

b) $x = t-4$

c) $x-3 = t$

d) $x-1 = t$

10) During the decay of radioactive isotope ${}^{232}_{90}\text{X}$ to a stable isotope, six α -particles and four β -particles are emitted, what is the atomic number 'Z' and mass number 'A' of the stable isotopes. (UHS: 2015)

a) Z = 70, A = 220

b) Z = 78, A = 212

c) Z = 82, A = 212

d) Z = 82, A = 208

11) What will be the energy of accelerated electron used to produce x-rays. When the accelerating potential is 2 kV? (UHS: 2014)

a) 2×10^{-19} J

b) 1.6×10^{-19} J

c) 3.2×10^{19} J

d) 3.2×10^{-16} J

12) A β -particle is a fast moving electron. During a β -decay how the atomic number and mass number of a nucleus change? (UHS: 2014)

	Atomic Number	Mass Number
a)	Remains the same	Increases by one
b)	Increases by one	decreases by two
c)	Increases by one	Remains the same
d)	decreases by two	decreases by four

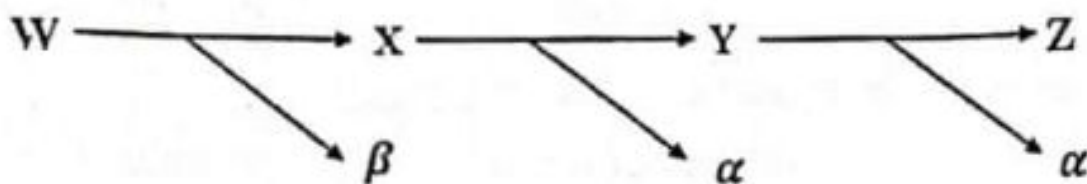
13) A uranium isotope ${}^{232}_{92}\text{U}$ undergoes one α -decay and one β -decay. What is the final product? (UHS: 2014)

- a) 90 b) 91 c) 89 d) 88

14) A naturally occurring radioactive element decays two alpha particles. Which one of the following represents status of daughter element with respect to mass number 'A' and charge number 'Z'? (UHS: 2014)

- a) 'Z' decreases by 4, and 'A' decreases by 2 b) 'Z' decreases by 2, and 'A' decreases by 4
c) 'Z' decreases by 4, and 'A' decreases by 8 d) 'Z' decreases by 8, and 'A' decreases by 4

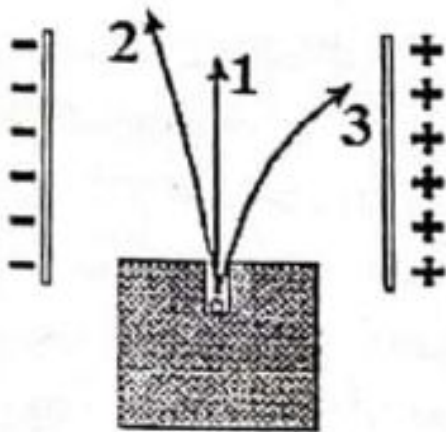
15) A radioactive isotope 'W' decays to 'X' which decays to 'Y' and 'Y' decays to 'Z' as represented by the figure below: (UHS: 2014)



What is the change in atomic number from 'W' to 'Z'?

- a) increases by 3 b) decreases by 3 c) increases by 5 d) decreases by 5

16) Three paths of radioactive radiations are observed as shown in figure in the presence of electric field. Which type of radiation is shown in path 1? (UHS: 2014)



- a) alpha b) beta c) gamma d) cathode rays

17) Among the three types of radioactive radiation, which have strongest penetration power? (UHS: 2013)

- a) Alpha b) gamma c) beta d) all have same penetration power

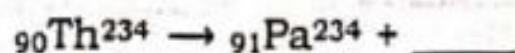
18) Emission of α -decay from a radioactive substance causes: (UHS: 2013)

- a) decrease in 'Z' by 4, and decrease in 'A' by 2 b) decrease in 'A' by 1, and 'Z' remains same
c) decrease in 'Z' by 1, and 'A' remains same d) decrease in 'A' by 4, and decrease in 'Z' by 2

19) Isotopes are those nuclei of an element that have: (UHS: 2013)

- a) same mass no. but different atomic no. b) same mass no. as well as atomic no.
c) different mass no. as well as atomic no. d) same atomic no. but different mass no.

20) Which one of the following emission takes place in a nuclear reaction? (UHS: 2013)



- a) Alpha b) gamma c) beta d) photons

21) Emission of radiation from radioactive substance is: (UHS: 2013)


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dependent on both temp and pressure

Independent of both temp and pressure

b) Independent of temp but dependent on pressure

d) Independent of pressure but dependent on temp

(UHS: 2012)

radioactive nuclide decays by emitting an alpha particle, a beta particle and a gamma ray. If the change in the nucleon number will be: (UHS: 2012)

a) -4 b) -1 c) -2 d) -3

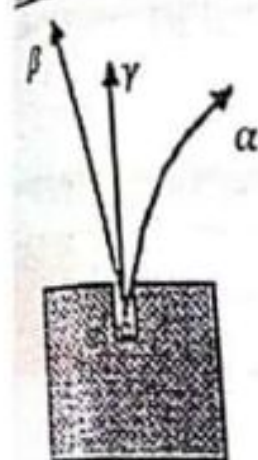
(UHS: 2012)

half-life of sodium-24 is _____ which is used to estimate the volume of blood in a patient:

a) 6 hours b) 5 hours c) 8 hours d) 15 hours

(UHS: 2012)

a radioactive phenomenon observation shown in figure where α deviates lesser than β in some electric or magnetic field (not shown in figure). What is the reason of less deviation of α ?



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- a) α is charged particle b) α is neutral particle
c) α is heavier particle d) α is lighter particle
- 6) Which of the following effect is observed due to emission of β^- during the phenomenon of radioactivity? (UHS: 2012)
- a) A increases by 1 and Z remains same b) Z increases by 1 and A remains same
c) Z decreases by 1 and A remains same d) A decreases by 1 and Z remains same
- 7) Ionizing capability of gamma rays is: (UHS: 2011)
- a) Equal to alpha and beta particle b) Less than alpha but greater than beta particles
c) Less than both alpha and beta particles d) Less than beta but greater than alpha particles
- 28) Half-life of a radioactive element is: (UHS: 2011)
- a) Inversely proportional to square of decay constant
b) directly proportional to square of decay constant
c) Directly proportional to decay constant d) Inversely proportional to decay constant
- 29) The transformation of a neutron into proton in the nucleus gives rise to emission of: (UHS: 2011)
- a) Beta particles b) Alpha particles c) Gamma particles d) x-rays
- 30) The ratio of the rate of decay of a parent atom to the number of radioactive nuclei present at that time is equal to: (UHS: 2011)
- a) Half-life of radioactive element b) mean life

c) Decay constant of radioactive element

d) Activity of radioactive element

31) Which one of the following particle is emitted as a result of nuclear reaction? (UHS: 2011)



a) Beta

b) Alpha

c) Gamma rays

d) One alpha and one beta

32) In the half-life of an element, the equation for the number of decaying atoms is (UHS: 2010)

a) $\Delta N \propto -N\Delta t$

b) $\Delta N = KN\Delta t$

c) $\Delta N \propto -n\Delta t$

d) $\Delta N = -\Delta N\Delta t$

33) Decay constant ' λ ' is given by (UHS: 2010)

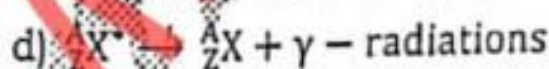
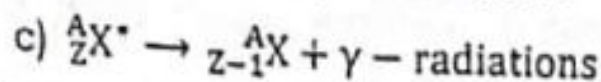
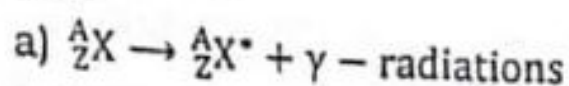
a) $-\frac{\Delta N/N}{\Delta t}$

b) $-\frac{\Delta N}{\Delta t}$

c) $-\frac{N}{\Delta t}$

d) $\frac{\Delta N/N}{\Delta t}$

34) The emission of γ -radiations from the nucleus is generally represented by the equation: (UHS: 2009)



35) Which one is the most stable element on the basis of binding energy? (UHS: 2008)

a) Sn

b) Ba

c) Kr

d) Fe

36) _____ are the particles that experience strong nuclear force. (UHS: 2008)

a) electrons

b) Muons

c) Neutrinos

d) neutrons

37) The neutron is assumed to be made of (UHS: 2008)

a) one up quark and two down quarks b) two up quarks and two down quarks

c) two up quarks and one down quark d) one up quark and

38) A certain radioactive mass decays from 64 gm to 2 gm in 20 days. What is the half life? (UHS: 2008)

a) 5 days

b) 4 days

c) 10 days

d) 6 days

"I Think And Think For Months And Years.....!!!

Ninety Nine Times, The Conclusion Was False, The Hundredth Time I Was Right"



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ANSWER KEY OF MDCAT PAST PAPERS (2008-2017)

UNIT#01 MEASUREMENTS

c	5)	d	9)	b	13)	c	17)	d
c	6)	d	10)	b	14)	b	18)	a
b	7)	b	11)	b	15)	c	19)	a
c	8)	a	12)	b	16)	c	20)	b

UNIT#02 MOTION AND FORCE

a	3)	d	5)	a
b	4)	a	6)	d

UNIT#03 WORK, POWER AND ENERGY

d	1)	b	7)	b	10)	c	13)	d
b	2)	c	8)	C	11)	b	14)	c
d	3)	b	9)	D	12)	b		

UNIT#04 CIRCULAR MOTION

d	4)	d	7)	d	10)	d	13)	a
b	5)	b	8)	d	11)	a	14)	a
c	6)	b	9)	b	12)	a	15)	c

UNIT#05 OSCILLATIONS

1)	b	6)	d	11)	c	16)	c	21)	d	26)	d
2)	c	7)	a	12)	d	17)	d	22)	a	27)	c
3)	c	8)	a	13)	a	18)	b	23)	a	28)	d
4)	d	9)	c	14)	c	19)	b	24)	c		
5)	c	10)	a	15)	a	20)	a	25)	d		

UNIT#06 WAVES

1)	b	4)	b	7)	b	10)	c
2)	b	5)	c	8)	a	11)	a
3)	a	6)	c	9)	a	12)	b

UNIT#07 LIGHT

1)	b	4)	b	7)	c	10)	d	13)	c	16)	a
2)	b	5)	a	8)	d	11)	a	14)	d		
3)	c	6)	b	9)	d	12)	d	15)	d		

UNIT#08 HEAT AND THERMODYNAMICS

1)	a	6)	a	11)	d	16)	a	21)	b	26)	a
2)	c	7)	d	12)	b	17)	d	22)	d	27)	c
3)	a	8)	a	13)	b	18)	c	23)	a	28)	a
4)	d	9)	a	14)	a	19)	a	24)	c		
5)	d	10)	c	15)	b	20)	b	25)	d		

UNIT#09 ELECTROSTATICS

3)	a	5)	c	7)	c	9)	c
4)	a	6)	a	8)	b	10)	a

UNIT#10 CURRENT ELECTRICITY

4)	c	7)	C	10)	d	13)	d
5)	d	8)	D	11)	b	14)	c
6)	d	9)	C	12)	c	15)	d

UNIT#11 ELECTROMAGNETISM

a	5)	c	9)	d	13)	a	17)	a	21)	c
c	6)	c	10)	c	14)	b	18)	d	22)	b
b	7)	d	11)	a	15)	c	19)	b	23)	a
b	8)	b	12)	c	16)	b	20)	d		

UNIT#12 ELECTROMAGNETIC INDUCTION

c	2)	b	3)	c	4)	b
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UNIT#13 DEFORMATION OF SOLIDS

1) d	4) a	7) c	10) c	13) c
2) d	5) b	8) d	11) c	14) b
3) a	6) c	9) c	12) d	

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UNIT#14 ELECTRONICS

1) b	3) a	5) b	7) c
2) d	4) b	6) d	

Physics

UNIT#15 Modern Physics

1) a	7) b	13) a	19) c	25) b	31) c
2) a	8) b	14) c	20) c	26) a	32) a
3) d	9) d	15) a	21) d	27) d	33) d
4) a	10) c	16) d	22) a	28) b	34) c
5) a	11) d	17) c	23) b	29) a	35) a
6) b	12) d	18) a	24) d	30) c	

UNIT#16 Nuclear Physics

1) b	7) c	13) b	19) d	25) c	31) b	37) a
2) c	8) a	14) c	20) c	26) b	32) a	38) b
3) d	9) b	15) b	21) c	27) c	33) a	39)
4) c	10) d	16) c	22) d	28) d	34) d	40)
5) b	11) d	17) b	23) a	29) a	35) d	41)
6) d	12) c	18) d	24) b	30) c	36) d	42)