estion Review	All
A body of mass 4 kg weighs 4.8 kg when suspended in a moving lift. Th	e acceleration of the
lift is	
9.8 m/s ² downwards	
○ 9.8 m/s² upwards	
○ 1.96 m/s² downwards	
• 1.96 m/s ² upwards	
KPLANATIONS	<u>Report</u> (
58 % were correct! The apparent weight of the body is more than its standard weight. The direction. $R=m(g+a)\Rightarrow 4.8g=4(g+a)$ $\Rightarrow a=0.2g=1.96 \mathrm{m/s^2}$	erefore we can say that acceleration of the lift is in upwar
When light wave suffers reflection at the interface from air to glass, the the reflected wave is equal to	change in phase of
the reflected wave is equal to 0	change in phase of
the reflected wave is equal to	change in phase of
the reflected wave is equal to $ \bigcirc \ 0 $	change in phase of
the reflected wave is equal to $ \bigcirc \ 0 $ $ \bigcirc \ \frac{\pi}{2} $	change in phase of
the reflected wave is equal to	change in phase of Report.
the reflected wave is equal to	Report. (
the reflected wave is equal to	Report (ways occurs. applying brakes. If the

	16m
()	1011

	0 1
)	74m

32m

EXPLANATIONS

Report !

56 % were correct!

 $s \propto u^2$ i.e. if speed becomes double then stopping distance will become four times i.e. 8 x 4 = 32m

If the change in the value of \dot{g} at a height h above the surface of the earth is the same as at a depth x below it, then (both x and h being much smaller than the radius of the earth)



$$x = 2h$$

$$x = \frac{h}{2}$$

$$\bigcirc$$
 x = h²

EXPLANATIONS

Report (

68 % were correct!

The value of g at the height h from the surface of earth

$$g'=g\,\left(1-rac{2h}{R}
ight)$$

The value of g at depth x below the surface of earth

$$g'=g\left(1-rac{x}{R}
ight)$$

These two are given equal, hence $\left(1-rac{2h}{R}
ight)=\left(1-rac{x}{R}
ight)$ On solving, we get x=2h

To get three images of a single object, one should have two plane mirrors at an angle of



○ 60°

○ 120°

EXPLANATIONS

Report !

48 % were correct!

Number of images formed when an object is placed between mirrors inclined at an angle $heta^\circ$ is given by the formula

$$n=rac{360^{\circ}}{ heta^0}-1$$

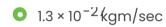
Given n=3,

$$\Rightarrow 3 = \frac{360^\circ}{\theta^\circ} - 1$$

$$\Rightarrow 4 heta^\circ = 360^\circ$$

$$\Rightarrow heta^\circ = 90^\circ$$

The momentum of the photon of wavelength 5000\AA will be



- \bigcirc 2.6 × 10⁻² kgm/sec
- \bigcirc 3.9 × 10⁻² kgm/sec
- \bigcirc 4.5 × 10⁻² kgm/sec

EXPLANATIONS Report (!)

67 % were correct!

$$p = rac{E}{c} = rac{hf}{c} = rac{h}{\lambda} = rac{6.6 imes 10^{-34}}{\left(5000 imes 10^{-10}
ight)} = 1.3 imes 10^{-27} kgm/s$$

An ideal gas undergoes a quasi static, reversible process in which its molar heat capacity C remains constant. If during this process the relation of pressure P and volume V is given by $PV^n = \text{constant}$, then n is given by (Here C_P and C_V are molar specific heat at constant pressure and constant volume, respectively):

$$n = \frac{CP}{C - CV}$$

$$n = \frac{C - CV}{C - CP}$$

$$n = \frac{CP}{CV}$$

$$n = \frac{C - C_F}{C - C_V}$$

EXPLANATIONS

Report !

19 % were correct!

In isobaric process (process in which pressure remains constant),

Molar heat capacity $C=C_p$

Also,
$$P=\operatorname{const} \Rightarrow PV^0=\operatorname{constant}$$
 . $n=0$

We have,

$$C_v=rac{3}{2}R$$
 for monoatomic gas

$$C=C_p=C_v+R=rac{3}{2}R+R=rac{5}{2}R$$

Now, using the options and verifying n=0 for $C=C_p=rac{5}{2}R$ and $C_v=rac{3}{2}R$

we get the correct answer

$$\mathrm{n} = rac{\mathrm{C} - \mathrm{C_P}}{\mathrm{C} - \mathrm{C_V}}$$

lonization potential of hydrogen atom is 13.6 $e\,V$. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 $e\,V$. The spectral lines emitted by hydrogen atoms according to Bohr's theory will be

- One
- Two
- Three
- O Four

EXPLANATIONS Report (!)

45 % were correct!

Final energy of electron $=-13.6+12.1=-1.51\,eV$. which is corresponds to energy of electron in third orbit i.e.n=3.

$$E = -rac{13.6}{n^2} \; \mathrm{eV} = -rac{13.6}{3^2} \; \mathrm{eV} = -1.51 \; \mathrm{eV}$$

When electron falls from 3^{rd} orbit to 1^{st} orbit, number of spectral lines emitted is given as $=rac{n(n-1)}{2}=rac{3(3-1)}{2}=3$

This is because following electron transition can occur:-

s/n.	From	То
1	3	2
2	2	1
3	3	1

If the increase in the kinetic energy of a body is 22%, then the increase in the momentum will be

O 22%

44%

0 10%

O 300%

EXPLANATIONS Report (!)

60 % were correct!

 $P=\sqrt{2mE}$. If m is constant then

$$rac{P_2}{P_1} = \sqrt{rac{E_2}{E_1}} = \sqrt{rac{1.22E}{E}} \Rightarrow rac{P_2}{P_1} = \sqrt{1.22} = 1.1$$

$$\Rightarrow P_2 = 1.1 P_1 \Rightarrow P_2 = P_1 + 0.1 P_1 = P_1 + 10\% ext{ of } P_1$$

So the momentum will increase by 10%

The radius of the orbital of electron in the hydrogen atom 0.5 Å. The speed of the electron is $2 imes 10^6~m/s$. Then the current in the loop due to the motion of the electron is

O 1mA

○ 1.5 mA

2.5 mA

○ 1.5*10⁻² mA

EXPLANATIONS Report (!)

38 % were correct!

Time period of revolution of electron $T=rac{2\pi}{\omega}=rac{2\pi r}{v}$

Hence corresponding electric current $i=rac{e}{T}=rac{ev}{2\pi r}$

$$\Rightarrow i = rac{1.6 imes 10^{-19} imes 2 imes 10^6}{2 imes 3.14 imes 0.5 imes 10^{-10}} = 1 mA$$

The phase difference between two waves represented by

$$y_1 = 10^{-6} \sin[100t + (x/50) + 0.5]m$$

$$y_2 = 10^{-6}\cos[100t + (x/50)]m$$

where x is expressed in metres and t is expressed in seconds, is approximately

0.5 rad

1.07 rad

1.5 rad

2.07 rad

EXPLANATIONS Report !

39 % were correct!

$$y_1 = 10^{-6} \sin[100t + (x/50) + 0.5]$$

$$y_2=10^{-6}\siniggl[100t+iggl(rac{x}{50}iggr)+iggl(rac{\pi}{2}iggr)iggr]$$

Phase difference ϕ

$$= [100t + (x/50) + 1.57] - [100t + (x/50) + 0.5]$$

= 1.07 radians.

Two capillaries made of the same material with radii $r_1=1mm$ and $r_2=2mm$. The rise of the liquid in one capillary is 30 cm, then the rise in the other will be

7.5 cm

0 15 *cm*

○ 60 *cm*

120 cm

EXPLANATIONS Report []

73 % were correct!

Capillary rise (h)
$$=rac{2T}{rdg}$$

$$h \propto \frac{1}{r}$$

$$\therefore rac{h_2}{h_1} = rac{r_1}{r_2} = rac{1}{2} \Rightarrow h_2 = rac{30}{2} = 15 \mathrm{cm}$$

 $\int rac{1}{x \log x} dx =$

logx

xlogx

log(logx)

onone of these

EXPLANATIONS Report !

75 % were correct!

$$\frac{d}{dx}\log x = \frac{1}{x}$$

So,

$$\int rac{1}{x \log x} dx = \log(\log x)$$

The direction cosines of the line x=y=z are

 $\begin{array}{cccc}
 & \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}
\end{array}$

 $\bigcirc \quad \frac{1}{3}, \frac{1}{3}, \frac{1}{3}$

0 1, 1, 1

None of these

EXPLANATIONS Report !

73 % were correct!

The line passes through points (0,0,0) and (1,1,1).

So direction ratios are 1, 1, 1.

And hence the direction cosines are $\dfrac{1}{\sqrt{3}},\dfrac{1}{\sqrt{3}},\dfrac{1}{\sqrt{3}}$

If $A=\emptyset$, then, the cardinality of $2^{P(A)}$ is:

O 0

 \bigcirc 1

O 2

can't be determined

EXPLANATIONS

Report !

35 % were correct!

The empty set's power set, i.e, P(A) has $2^0=1$, i.e, one element, the empty set itself.

So,
$$P(A)=\{\emptyset\}$$

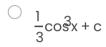
But, its power set, $2^{P(A)}$ will have $2^1=2$ elements.

The subsets are the empty set and the set itself.

So,
$$2^{P(A)}=\{\emptyset,\{\emptyset\}\}$$

NOTE: The cardinality of n^{th} power set of the empty set, i.e,the caardinality of $P(P(P(\dots ext{n times}(\emptyset))\dots)$ is 2^{n-1}

 $\int \sin^2 x \cos x dx =$



- \bigcirc sin³x + c
- $\frac{1}{3}\sin^3 x + c$
- none of these

EXPLANATIONS

Report !

70 % were correct!

Since the derivative of $\sin x$ is $\cos x$,

$$\int \sin^2 x \cos x dx = rac{1}{3} \sin^3 x + c$$

The first term of a harmonic progression is 1/7 and the second term is 1/9. The 12^{th} term is

- 0 1/19
- 0 1/29
- O 1/17
- O 1/27

EXPLANATIONS Report !

82 % were correct!

Here first term of A.P. be 7 and second be 9, then 12^{th} term will be 7+11 imes2=29. Hence 12^{th} term of the H.P. be $\frac{1}{29}$.

The position vectors of A and B are 2i-9j-4k and 6i-3j+8k respectively, then the magnitude of \overrightarrow{AB} is

- O 11
- O 12
- 14

EXPLANATIONS

Report !

78 % were correct!

$$\overrightarrow{AB} = (6-2)\mathbf{i} + (-3+9)\mathbf{j} + (8+4)\mathbf{k} = 4\mathbf{i} + 6\mathbf{j} + 12\mathbf{k}$$

$$|\overrightarrow{AB}| = \sqrt{16 + 36 + 144} = 14.$$

 $\sqrt{-2} imes \sqrt{-3} =$

- √6
- -√ 6
- i√ 6
- none of these

EXPLANATIONS

Report !

59 % were correct!

$$\sqrt{-2}\sqrt{-3}=i\sqrt{2}i\sqrt{3}=i^2\sqrt{6}=-\sqrt{6}$$

 $\lim_{x o 1}rac{1}{|1-x|}=$

- O
- \bigcirc 1
- O 2
- infinity

EXPLANATIONS

Report !

6/23/22, 3:50 PM Test Result | EngineeringDote 49 % were correct! $\lim_{x ightarrow 1-}rac{1}{1-x|}=\lim_{h ightarrow 0}rac{1}{1-(1-h)}=\infty$ And, $\lim_{x o 1+}rac{1}{1-x|}=\lim_{h o 0}rac{1}{1+h-1}=\infty$ Hence $\lim_{x o 1} rac{1}{1-x|} = \infty$ <u>2</u> Previous <u>Next</u>

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