Capacitance (in F) of a spherical conductor with radius 1 m is

1.1×10^{-10}

10^{-6}

9×10^{-9}

10^{-3} A car, moving with a speed of 50 km/hr, can be stopped by brakes after at least 6m. If the same car is moving at a speed of 100 km/hr, the minimum stopping distance is

6m

12m

18m

24m If the wave equation $y = 0.08 \sin \frac{2\pi}{\lambda}(200t - x)$, then the velocity of the wave will be

400

$400\sqrt{2}$

200

$200\sqrt{2}$ At absolute zero temperature, pressure of a gas will be

Zero

One atmospheric pressure

$P_0 \times 273$

$P_0 \times 76$

The temperature coefficient of resistance for a wire is $0.00125/^{\circ}C$. At 300K its resistance is 1 ohm. The temperature at which the resistance becomes 2 ohm is

1154 K

1100 K

1400 K

1127 K The inward and outward electric flux for a closed surface in units of Nm^2/C are respectively 8×10^3 and 4×10^3. Then the total charge inside the surface is [where $\varepsilon_0 =$ permittivity constant]

$4 \times 10^3 C$

$-4 \times 10^3 C$

$\frac{(-4 \times 10^3)}{\varepsilon} C$

$-4 \times 10^3 \varepsilon_0 C$ In the adjoining diagram, a wavefront AB, moving in air is incident on a plane glass surface XY. Its position CD after refraction through a glass slab is shown also along with the normals drawn at A and D. The refractive index of glass with respect to air ($\mu = 1$) will be equal to

$\frac{\sin\theta}{\sin\phi}$

$\frac{\sin\phi}{\sin\theta}$

$\frac{CD}{\overline{AB}}$

$\frac{AB}{\overline{CD}}$

A bullet moving with a uniform velocity v, stops suddenly after hitting the target and the whole mass melts be m, specific heat S, initial temperature 25°C, melting point 475°C and the latent heat L. Then v is given by

$mL = mS(475 - 25) + \frac{1}{2} \cdot \frac{mv^2}{J}$

$mS(475 - 25) + mL = \frac{mv^2}{2J}$

$mS(475 - 25) + mL = \frac{mv^2}{J}$

$mS(475 - 25) - mL = \frac{mv^2}{2J}$ Six identical bulbs are connected as shown in the figure with a DC source of emf E and zero internal resistance. The ratio of power consumption by the bulbs when (i) all are glowing and (ii) in the situation when two from section A and one from section B are glowing, will be

4:9

9:4

1:2

2:1 In a metre bridge experiment, null point is obtained at 20 cm from one end of the wire when resistance X is balanced against another resistance Y. If X<Y, then where will be the new position of the null point from the end, if one decides to balance a resistance of 4X against Y?

50 cm

80 cm

40 cm

70 cm A rifle bullet loses 1/20th of its velocity in passing through a plank. The least number of such planks required just to stop the bullet is

5

10

11

20 The potential difference between points A and B of adjoining figure is

$\frac{2}{3}V$

$\frac{8}{9}V$

$\frac{4}{3}V$

$2V$

$$\int \tan x dx =$$

$\ln|\sec x|$

$\ln|\sin x|$

$\ln|\text{cosec}x|$

$\ln|\cos x|$ A point (x, y, z) moves parallel to X axis. Which of the three variable x, y, z remain fixed?

x

y and z

x, y and z

none of these Difference between sum of first n even numbers and sum of first n odd numbers is :

n^2

$n-1$

$2n$

n The value of $\tan\left(\tan^{-1}\frac{1}{2}-\tan^{-1}\frac{1}{3}\right)$ is :

$5/6$

$7/6$

$1/6$

$1/7$

$\int 5 \sin x dx =$

$5 \cos x + c$

$-5 \cos x + c$

$-5 \sin x + c$

$5 \sin x + c$

If I is an identity matrix of order n then $3I - I^2$ is a :

null matrix

scalar matrix

triangular matrix

diagonal matrix The direction cosines of line joining $(1, 3, 2)$ and $(2, 1, 4)$ are:

$\pm \left(\frac{1}{3}, -\frac{2}{3}, \frac{2}{3} \right)$

$\pm \left(\frac{1}{3}, \frac{2}{3}, \frac{2}{3} \right)$

$\pm \left(-\frac{1}{3}, -\frac{2}{3}, \frac{2}{3} \right)$

none of these The function $f(x) = \frac{x}{x-1}$, where $x \neq 1$, defined on codomain $R - \{1\}$ is:

invertible

surjective only

injective only

not a function If z is a purely imaginary number then, $\left| \frac{z-1}{z+1} \right| =$

1

0

|z|

none of these The coefficient of x^6 in the expansion of $\left(1 + x^2 + x^4 + x^6\right)^3$ is :

6

8

10

none of these The vertex of the parabola $3x - 2y^2 - 4y + 7 = 0$ is

(3,1)

(-3,-1)

(-3,1)

none of these If $f(x) = \ln(x + \sqrt{x^2 - 1})$ then $f^{-1}(x) =$

$\cosh x$

$\sinh x$

$\tanh x$

doesn't exist Let a, b and c be vectors with magnitudes 3, 4 and 5 respectively and a + b + c = 0, then the values of a.b + b.c + c.a is

47

25

50

- 25

If $a + b + c = 0$, then the solution of the equation $\begin{vmatrix} a-x & c & b \\ c & b-x & a \\ b & a & c-x \end{vmatrix} = 0$ is

0

$\pm\frac{3}{2}(a^2 + b^2 + c^2)$

$0, \pm\sqrt{\frac{3}{2}(a^2 + b^2 + c^2)}$

$0, \pm\sqrt{a^2 + b^2 + c^2}$ $\int \frac{dx}{2x^2 + x + 1} =$

$\frac{1}{\sqrt{7}}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

$\frac{1}{2\sqrt{7}}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

$\frac{1}{2}\tan^{-1}\left(\frac{4x+1}{\sqrt{7}}\right) + c$

None of these

Thomas slag is

$Ca_3\,(PO_4)_2$

$MnSiO_3$

$\mathrm{CaSiO_3}$

$\mathrm{FeSiO_3}$ Volume of $\frac{N}{10}H_2SO_4$ required to neutralize 10 *ml* 5 *N* Na_2CO_3 is

100 *ml*

50 *ml*

500 *ml*

1000 *ml*

Spelter is:

impure copper

impure zinc

ZnO

CuO Which has maximum number of atoms ?

24g of C (12)

56g of Fe(56)

27g of Al (27)

108g of Ag (108) 0.383g of a metal on reaction with an acid displaced 131cc of dry H_2 at STP. The specific heat of metal is o.1. The exact atomic weight of metal is

63.5

65.4

69.8

72.8 3 g of an oxide of a metal is converted into chloride and it yielded 5 g of chloride. Find the equivalent weight of the metal.

33.25

3.325

12

20 A metallic carbide on treatment with water gives a colourless gas which burns readily in air and gives a precipitate with ammoniacal silver nitrate solution. Gas evolved is

Methane

Ethane

Acetylene

Ethylene The atomic weights of two elements X and Y are 20 and 40 respectively. If ‘a’ gm of X contains ‘b’ atoms, how many atoms are present in ‘2a’ gm of Y ?

b

a

2b

a/2 antonym of extensive:

narrow

compact

expensive

abstract Ravi stayed home from school on Monday.

a simple sentence

a compound sentence

a complex sentence

a compound-complex sentence ‘birthday’ is transcribed as:

$/bde/$

$/b : ðde/$

$/b : \theta de/$

$/b : \theta de/$

‘serious’ is transcribed as:

$/'seriz/$

$/'seris/$

$/'sriz/$

$/'sris/$