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| **Question Paper Name:** | Electronics and Instrumentation Engineering |
| **Subject Name:** | Electronics and Instrumentation Engineering |

Mathematics

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| **Number of Questions:** | 50 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

**Question Number : 1  Question Id : 67809418024  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $A = \begin{pmatrix} 2 & -1 & 0 \\ 3 & 4 & 7 \end{pmatrix}$ and $B = \begin{pmatrix} 5 & 2 & -3 \\ 1 & 0 & -2 \end{pmatrix}$ then $2A+3B =$

**Options :**

1. $\begin{pmatrix} 19 & 4 & -9 \\ 9 & 8 & 8 \end{pmatrix}$

2. $\begin{pmatrix} -19 & -4 & 9 \\ 9 & 8 & -8 \end{pmatrix}$

3. $\begin{pmatrix} 18 & 4 & -9 \\ 9 & 8 & 8 \end{pmatrix}$

4. $\begin{pmatrix} 17 & 5 & -9 \\ 8 & 8 & 9 \end{pmatrix}$

**Question Number : 2  Question Id : 67809418025  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $A = \begin{pmatrix} 2 & -3 & 0 \\ 1 & 4 & -1 \end{pmatrix}$ and $B = \begin{pmatrix} 6 & 1 \\ 3 & 0 \\ 5 & 2 \end{pmatrix}$ then $(AB)^T =$

**Options :**

1. $A^T B^T$

2. $B^T A^T$

3. $(BA)^T$

4. $AB^T$

**Question Number : 3  Question Id : 67809418026  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If two rows or two columns of a determinant are identical then the value of the determinant is

**Options :**

1. 2

2. -1

3. 0

4. -2

**Question Number : 4  Question Id : 67809418027  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\begin{vmatrix} 265 & 240 & 219 \\ 240 & 225 & 198 \\ 219 & 198 & 181 \end{vmatrix}$ is

**Options :**

1. -1

2. 0

3. 1

4. 2

**Question Number : 5  Question Id : 67809418028  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The adjoint of the square matrix $A = \begin{pmatrix} 2 & 5 & 1 \\ 3 & 1 & 2 \\ 4 & 3 & 1 \end{pmatrix}$ is

**Options :**

1. $\begin{pmatrix} -5 & -2 & 9 \\ 5 & -2 & -1 \\ 5 & 14 & -13 \end{pmatrix}$

2. $\begin{pmatrix} 5 & 2 & 9 \\ 5 & -2 & -1 \\ 5 & 14 & -13 \end{pmatrix}$

3. $\begin{pmatrix} -5 & -2 & 9 \\ -5 & -2 & -1 \\ -5 & 14 & -13 \end{pmatrix}$

4. $\begin{pmatrix} -5 & -2 & -9 \\ 5 & 2 & 1 \\ 5 & 14 & -13 \end{pmatrix}$

**Question Number : 6  Question Id : 67809418029  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Resolve into partial fractions: $\dfrac{5}{(2x-1)(3x-1)} =$

**Options :**

1. $\dfrac{8}{2x-1} + \dfrac{5}{3x-1}$

2. $\dfrac{10}{2x-1} - \dfrac{15}{3x-1}$

3. $\dfrac{11}{3x-1} + \dfrac{7}{2x-1}$

4. $\dfrac{1}{2x-1} + \dfrac{2}{3x-1}$

**Question Number : 7  Question Id : 67809418030  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Resolve into partial fractions: $\dfrac{3x-1}{(x-1)(x-2)(x-3)} =$

**Options :**

1. $\dfrac{2}{x-1} + \dfrac{5}{x-2} - \dfrac{4}{x-3}$

2. $\dfrac{-1}{x-1} + \dfrac{5}{x-2} - \dfrac{4}{x-3}$

3. $\dfrac{1}{x-1} + \dfrac{5}{x-2} + \dfrac{4}{x-3}$

4. $\dfrac{1}{x-1} - \dfrac{5}{x-2} + \dfrac{4}{x-3}$

**Question Number : 8  Question Id : 67809418031  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $\tan A = \dfrac{1}{2}$  and  $\tan B = \dfrac{1}{3}$  then $\tan(A - B) =$

**Options :**

1. $\dfrac{1}{7}$

2. $\dfrac{-1}{7}$

3. $\dfrac{1}{5}$

4. $\dfrac{1}{3}$

**Question Number : 9  Question Id : 67809418032  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\cot 2A + \tan A =$

**Options :**

1. $\sin 2A$

2. $\cos 2A$

3. $\sec 2A$

4. $\operatorname{cosec} 2A$

**Question Number : 10  Question Id : 67809418033  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\frac{1-\cos 2A + \sin 2A}{1 + \cos 2A + \sin 2A} =$

Options :

1. $\sin A$

2. $\cos A$

3. $\tan A$

4. $\cot A$

The value of $\sin \frac{\pi}{5} \sin \frac{2\pi}{5} \sin \frac{3\pi}{5} \sin \frac{4\pi}{5} =$

Options :

1. $\frac{4}{15}$

2. $\frac{5}{16}$

3. $\frac{-5}{16}$

4. $\frac{7}{15}$

The value of $\cos 20^0 + \cos 100^0 + \cos 140^0 =$

Options :

1. $0$

2. $3$

3. $1$

4. $-3$

**Question Number : 13   Question Id : 67809418036   Display Question Number : Yes   Single Line Question Option : No   Option Orientation : Vertical**

The value of $\sum a(b^2 + c^2)\cos A$ is

Options :

1. $2abc$

2. $4abc$

3. $3abc$

4. $5abc$

**Question Number : 14   Question Id : 67809418037   Display Question Number : Yes   Single Line Question Option : No   Option Orientation : Vertical**

The value of $(a - b)^2 \cos^2\left(\frac{C}{2}\right) + (a + b)^2 \sin^2\left(\frac{C}{2}\right)$ is

Options :

1. $C^3$

2. $C$

3. $C^5$

4. $C^2$

**Question Number : 15   Question Id : 67809418038   Display Question Number : Yes   Single Line Question Option : No   Option Orientation : Vertical**

The value of $2\tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{1}{7}\right)$ is

Options :

1. $\pi/4$

2. $\pi/2$

3. $\pi/6$

4. $\pi/3$

**Question Number : 16   Question Id : 67809418039   Display Question Number : Yes   Single Line Question Option : No   Option Orientation : Vertical**

The general solution of $4\cos^2 x - 3 = 0$ is

**Options :**

1. $2n\pi \pm \dfrac{\pi}{6}$

2. $2n\pi \pm \dfrac{7\pi}{6}$

3. $3n\pi \pm \dfrac{5\pi}{6}$

4. $2n\pi \pm \dfrac{11\pi}{6}$

**Question Number : 17  Question Id : 67809418040  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \dfrac{\pi}{2}$ , then the value of $xy + yz + zx$ is

**Options :**

1. -1

2. 3

3. 5

4. 1

**Question Number : 18  Question Id : 67809418041  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The modulus of a complex number $\sqrt{3} + i$  is

**Options :**

1. -2

2. 3

3. 2

4. 5

**Question Number : 19  Question Id : 67809418042  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $x + \frac{1}{x} = 2\cos\theta$ then the value of $x^n + \frac{1}{x^n}$ is

Options :

1. $2\cos n\theta$

2. $-2\cos n\theta$

3. $3\cos\theta$

4. $2\sin n\theta$

Question Number : 20  Question Id : 67809418043  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The centre of the circle: $x^2 + y^2 - 2x + 6y - 6 = 0$ is

Options :

1. $(1,3)$

2. $(2,3)$

3. $(1,-3)$

4. $(-1,3)$

Question Number : 21  Question Id : 67809418044  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The radius of the circle: $5x^2 + 5y^2 - 6x + 8y - 75 = 0$ is

Options :

1. -4

2. 4

3. 2

4. 3

Question Number : 22  Question Id : 67809418045  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical

The equation of the parabola with vertex $(2,-1)$ and focus $(2,-3)$ is

**Question Number : 23  Question Id : 67809418046  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The centre of the ellipse: $9x^2 + 25y^2 - 18x + 100y - 116 = 0$ is

**Options :**

1. $(2, -1)$

2. $(-1, -2)$

3. $(1, -2)$

4. $(1, 2)$

**Question Number : 24  Question Id : 67809418047  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The focus of the hyperbola: $\dfrac{x^2}{25} - \dfrac{y^2}{144} = 1$ is

**Options :**

1. $(-13, 0)$

2. $(13, 0)$

3. $(13, -1)$

4. $(13, 1)$

**Question Number : 25  Question Id : 67809418048  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The length of the major axis of the ellipse: $4x^2 + 3y^2 = 48$ is

**Options :**

1. 10

2. 11

3. 8

4. 13

**Question Number : 26  Question Id : 67809418049  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\lim_{x \to 1} \frac{x^3 - 1}{x - 1}$ is

**Options :**

1. 3

2. -3

3. 2

4. 1

**Question Number : 27  Question Id : 67809418050  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $y = \frac{a + bx}{b - ax}$ then the derivative of $y$ with respect to $x$ is

**Options :**

1. $\frac{a^2 + b^2}{(b - ax)^2}$

2. $\frac{a^2 + b^2}{(b + ax)^2}$

3. $\frac{a^2 - b^2}{(b - ax)^2}$

4. $\frac{a + b}{(b - ax)^2}$

**Question Number : 28  Question Id : 67809418051  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $y = x^3 e^x$ then $\dfrac{dy}{dx}$ is

**Options :**

1. $(x - 3)x^2 e^x$

2. $(x - 2)x^3 e^x$

3. $(x + 3)x^2 e^x$

4. $(x - 1)x^3 e^x$

**Question Number : 29  Question Id : 67809418052  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $y = \sec x + \tan x$ then $\dfrac{dy}{dx}$ is

**Options :**

1. $y \cos x$

2. $y \sec x$

3. $-y \sin x$

4. $y \tan x$

**Question Number : 30  Question Id : 67809418053  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If $y = \dfrac{2 + 3\sinh x}{3 + 2\sinh x}$ then the derivative of $y$ with respect to $x$ is

**Options :**

1. $\dfrac{5 \cosh x}{(3 + 2\sinh x)^2}$

2. $\dfrac{5 \sinh x}{(3 + 2\sinh x)^2}$

3. $\dfrac{5 \sin x}{(3 - 2\cosh x)^2}$

$$4. \quad \frac{\sinh^2 x}{(2-3\sinh x)^2}$$

If $y = \sqrt{\dfrac{1-\cos x}{1+\cos x}}$ then $\dfrac{dy}{dx}$ is

**Options :**

1. $\sec^2\left(\dfrac{x}{2}\right)$

2. $\cos^2\left(\dfrac{x}{2}\right)$

3. $\dfrac{1}{2}\cos^2\left(\dfrac{x}{2}\right)$

4. $\dfrac{1}{2}\sec^2\left(\dfrac{x}{2}\right)$

The angle between the curves $y = x^2 + 3x - 7$ and $y^2 = 2x + 5$ at $(2,3)$ is

**Options :**

1. $\tan\theta = 2$

2. $\sec\theta = 2$

3. $\cos\theta = 1$

4. $\sin\theta = 3$

The range of $x$ for which the function $x^3 - 3x^2 - 45x + 2$ is increasing with $x$ is

**Options :**

1. $(3, -5)$

2. $(-3, -5)$

3. $(3, 5)$

4. $(-3, 5)$

**Question Number : 34 Question Id : 67809418057 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

The maximum value of the function $2x^3 - 12x^2 + 18x + 5$ is

**Options :**

1. 13

2. 12

3. 10

4. 15

**Question Number : 35 Question Id : 67809418058 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

If $u$ is a homogeneous function of $x$ and $y$ with degree $n$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$

**Options :**

1. $-nu$

2. $n^2 u$

3. $nu$

4. $nu^2 + u$

**Question Number : 36 Question Id : 67809418059 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

The value of $\int \frac{\cos\sqrt{x}}{\sqrt{x}} dx$ is

**Options :**

1. $2\sin\sqrt{x} + c$

2. $3 \sin \sqrt{x} + c$

3. $2 \sin x + c$

4. $\sin \sqrt{x} + c$

**Question Number : 37  Question Id : 67809418060  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\int \frac{dx}{\sqrt{a^2 - x^2}}$ is

**Options :**

1. $\cos^{-1}\left(\frac{x}{a}\right) + c$

2. $\sin^{-1}\left(\frac{x}{a}\right) + c$

3. $\sinh^{-1}\left(\frac{x}{a}\right) + c$

4. $\sin^{-1}\left(\frac{a}{x}\right) + c$

**Question Number : 38  Question Id : 67809418061  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\int \frac{dx}{4x^2 + 4x + 17}$ is

**Options :**

1. $\frac{1}{8}\tan^{-1}\left(\frac{2x+1}{4}\right) + c$

2. $\frac{1}{4}\cot^{-1}\left(\frac{2x+1}{4}\right) + c$

3. $\frac{1}{8}\sin^{-1}\left(\frac{2x+1}{4}\right) + c$

4. $\frac{1}{3}\tan^{-1}\left(\frac{2x+1}{4}\right) + c$

**Question Number : 39  Question Id : 67809418062  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\int \log x \, dx$ is

**Options :**

1. $x \log x + x + c$

2. $x^2 \log x - x + c$

3. $x \log x - x + c$

4. $x \log x - \dfrac{x^2}{2} + c$

**Question Number : 40  Question Id : 67809418063  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\int_1^4 \left( \sqrt{x} + \dfrac{1}{\sqrt{x}} \right) dx$ is

**Options :**

1. $\dfrac{20}{3}$

2. $-\dfrac{20}{3}$

3. $\dfrac{10}{3}$

4. $\dfrac{15}{3}$

**Question Number : 41  Question Id : 67809418064  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\int_0^{\pi/2} \sin^2 x \, dx$ is

**Options :**

1. $\dfrac{\pi}{2}$

2. $-\dfrac{\pi}{4}$

3. $\dfrac{\pi}{6}$

4. $\dfrac{\pi}{4}$

**Question Number : 42  Question Id : 67809418065  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The area enclosed between the curve $y^2 = 4ax$ and the line $x = 2y$ is

**Options :**

1. $\dfrac{64}{5}$ sq. units

2. $\dfrac{64}{3}$ sq. units

3. $\dfrac{65}{4}$ sq. units

4. $\dfrac{63}{4}$ sq. units

**Question Number : 43  Question Id : 67809418066  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The value of $\lim_{n \to \infty}\left[\dfrac{1}{n+1}+\dfrac{1}{n+2}+\cdots\cdots+\dfrac{1}{n+n}\right]$ is

**Options :**

1. $\log 2$

2. $\log 3$

3. $-\log 2$

4. $\log n$

**Question Number : 44  Question Id : 67809418067  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Form the differential equation by eliminating the arbitrary constant $a$ from $ay^2 = x^3$

**Options :**

1. $\dfrac{dy}{dx} = \dfrac{3y}{2x}$

2. $\dfrac{dy}{dx} = \dfrac{2x}{3y}$

3. $\dfrac{dy}{dx} = \dfrac{x}{y}$

4. $\dfrac{dy}{dx} = \dfrac{2y}{x}$

**Question Number : 45  Question Id : 67809418068  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The solution of $\sqrt{1-y^2}\,dx + \sqrt{1-x^2}\,dy = 0$ is

**Options :**

1. $\cos^{-1} x + \cos^{-1} y = c$

2. $\sinh^{-1} x + \cosh^{-1} y = c$

3. $\cos^{-1} x + \sec^{-1} x = c$

4. $\sin^{-1} x + \sin^{-1} y = c$

**Question Number : 46  Question Id : 67809418069  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The solution of $\dfrac{dy}{dx} = (4x + y + 1)^2$ is

**Options :**

1. $\dfrac{1}{2}\tan^{-1}\left(\dfrac{4x+y+1}{2}\right) = x + c$

2. $\dfrac{1}{2}\cot^{-1}\left(\dfrac{4x+y+1}{2}\right) = x + c$

3. $-\dfrac{1}{2}\tan^{-1}\left(\dfrac{4x+y+1}{2}\right) = x + c$

4. $\frac{1}{2}\tan^{-1}\left(\frac{4x-y-1}{2}\right) = x + c$

The solution of exact differential equation $2xy\,dx + x^2dy = 0$ is

**Options :**

1. $x^2y^2 = c$

2. $x^2y = c$

3. $x^3y = c$

4. $x^2y^3 = c$

The solution of $\frac{dy}{dx} + y = e^{-x}$ is

**Options :**

1. $(x + c)e^{-x}$

2. $(x - c)e^x$

3. $(x + c)e^x$

4. $(x + c)e^{-2x}$

The particular integral of $(D^2 + 5D + 6)y = e^x$ is

**Options :**

1. $\dfrac{-e^{-x}}{12}$

2. $\dfrac{e^{2x}}{12}$

3. $\dfrac{e^x}{12}$

4. $\dfrac{e^x}{6}$

**Question Number : 50  Question Id : 67809418073  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The complementary function of $(D^2 + 3D + 2)y = 8\sin 5x$ is

**Options :**

1. $c_1 e^{-x} + c_2 e^{-2x}$

2. $c_1 e^{x} + c_2 e^{2x}$

3. $c_1 e^{-x} + c_2 e^{2x}$

4. $c_1 e^{2x} + c_2 e^{3x}$

Physics

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| **Number of Questions:** | 25 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

**Question Number : 51  Question Id : 67809418074  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Which of the following is not the unit of energy?

**Options :**

1. watt second

2. Pascal metre

3. Newton metre

4. Kilowatt hour

**Question Number : 52  Question Id : 67809418075  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The height of Mercury barometer is 76 cm and density of Mercury is 13.6 g/cc. The

corresponding height of water barometer in SI system is

**Options :**

1. 10.336 m

2. 103.36 m

3. 3.6m

4. 1.0336 m

**Question Number : 53  Question Id : 67809418076  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Angle made by the vector $(\sqrt{3}\ \bar{i} + \bar{j})$ with the X-axis is

**Options :**

1. $\pi/2$

2. $\pi/4$

3. $\pi/3$

4. $\pi/6$

**Question Number : 54  Question Id : 67809418077  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The minimum number of unequal forces in a plane that can keep a particle in equilibrium is

**Options :**

1. 4

2. 2

3. 3

4. 6

A body is thrown with a velocity of $(4\,\bar{i} + 3\bar{j})$ m/s. The maximum height attained by

the body is ($g = 10$ ms$^{-2}$)

**Options :**

1. 2.5 m

2. 4.5 m

3. 0.8 m

4. 0.45 m

A person in a lift, which ascends up with acceleration 10ms$^{-2}$, drops a stone from a height of

10m. The time of descent is ($g = 10$ ms$^{-2}$)

**Options :**

1. 0.5 s

2. 1 s

3. 1.5 s

4. 2 s

For a projectile, the ratio of maximum height reached to the square of time of flight is

**Options :**

1. 5:4

2. 5:2

3. 5:1

4. 10:1

**Question Number : 58  Question Id : 67809418081  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The ratio of distances travelled by a body, starting from rest and travelling with uniform acceleration, in successive intervals of time of equal duration will be

**Options :**

1. 1:2:3

2. 1:4:9

3. 1:3:5

4. 1:9:16

**Question Number : 59  Question Id : 67809418082  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A force of 12 N acts on a body of mass 4 kg placed on a rough surface. The coefficient of friction between body and surface is 0.2 and take g= 10 ms$^{-2}$. The acceleration of the body in ms$^{-2}$ is

**Options :**

1. 1

2. 0.5

3. 0.25

4. Zero

**Question Number : 60  Question Id : 67809418083  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Brakes stop a train in a certain distance d. When the braking force is made one fourth, the brakes will stop the train in a distance which is

Options :

1. d/2

2. 4d

3. 2d

4. d

**Question Number : 61  Question Id : 67809418084  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The product of linear momentum and velocity of a body represents

Options :

1. Kinetic energy of the body

2. Potential energy of the body

3. Half the Kinetic energy of the body

4. Twice the kinetic energy of the body

**Question Number : 62  Question Id : 67809418085  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A man weighing 60 kg eats plum cake whose energy content is 9800 calories. If all this energy could be utilised by him, he can ascend to a height of

Options :

1. 17 m

2. 100 m

3. 70 m

4. 60m

**Question Number : 63  Question Id : 67809418086  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A crane can lift up 10,000 kg of coal in 1 hour from a mine of depth 180m. If the efficiency of

the crane is 80%, its input power must be (g=10 ms$^{-2}$)

**Options :**

1. 62.5 kW

2. 6.25 kW

3. 50 kW

4. 5 kW

**Question Number : 64  Question Id : 67809418087  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The graph of acceleration as a function of displacement in the case of a body executing

simple harmonic motion is

**Options :**

1. Parabola

2. Hyperbola

3. Straight line with positive slope

4. Straight line with negative slope

**Question Number : 65  Question Id : 67809418088  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The pendulum of length 'L' swings from mean position to mean position 'n' times in one

second.The value of acceleration due to gravity is

**Options :**

1. $\pi^2 n^2 L$

2. $2\pi^2 n^2 L$

3. $(\pi^2 n^2 L)/2$

4. $4\pi^2 n^2 L$

**Question Number : 66  Question Id : 67809418089  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

When a source of sound is in motion towards a stationary observer, the effect observed is

**Options :**

1. Decrease in velocity of sound

2. Increase in velocity of sound

3. increase in frequency of sound

4. decrease in frequency of sound

**Question Number : 67  Question Id : 67809418090  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The voice of a male person is different from that of a female person because

**Options :**

1. Two sounds have different phases

2. Two persons are of different size

3. Two sounds travel with different velocities

4. Two sounds have different pitch

**Question Number : 68  Question Id : 67809418091  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If the sound absorption of a hall is changed by 2%, then the percentage change in the

reverberation time is

**Options :**

1. 2%

2. 4%

3. 1%

4. No change

**Question Number : 69  Question Id : 67809418092  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In which of the following process, the internal energy of the system remains constant?

**Options :**

1. Adiabatic

2. Isothermal

3. Isobaric

4. Isochoric

**Question Number : 70  Question Id : 67809418093  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Heat required to raise the temperature of one gram of water through 1 K is

**Options :**

1. 1.0 Kcal

2. 0.1 Kcal

3. 0.01 Kcal

4. 0.001 Kcal

**Question Number : 71  Question Id : 67809418094  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The specific heat of a gas in an isothermal process is

**Options :**

1. infinity

2. Zero

3. Finite positive

4. Finite negative

**Question Number : 72  Question Id : 67809418095  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Specific heat of aluminium is 0.25 cal/g/°C. The water equivalent of an aluminium vessel of

mass one kilogram is

**Options :**

1. 40 cal/°C

2. 400 cal/°C

3. 250 cal/°C

4. 25 cal/°C

**Question Number : 73  Question Id : 67809418096  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

What should be the percentage increase in the pressure so that the volume of a gas may

decrease by 5% at constant temperature?

**Options :**

1. 5%

2. 5.26%

3. 10%

4. 4.26%

**Question Number : 74  Question Id : 67809418097  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If the maximum kinetic energy of emitted photo electrons from a metal is 0.9 eV and work function is 2.2 eV, then the wavelength of incident radiation is

**Options :**

1. 4000Å

2. 8000Å

3. 3000Å

4. 2000Å

**Question Number : 75  Question Id : 67809418098  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If the angle of incidence of a ray is greater than the critical angle at the core – cladding interface in an optical fiber, then the ray travels

**Options :**

1. in the core

2. in the cladding

3. in the buffer

4. along the interface

<div align="center">Chemistry</div>

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| **Number of Questions:** | 25 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

**Question Number : 76  Question Id : 67809418099  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Pauli's Exclusion principle states that two electrons in same orbital have

**Options :**

1. same spins

2. different spins

3. opposite spins

4. vertical spins

**Question Number : 77  Question Id : 67809418100  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Orbits in which electrons move according to Bohr are

**Options :**

1. elliptical

2. cylindrical

3. circular

4. oval

**Question Number : 78  Question Id : 67809418101  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Phosphorus has an atomic number of 15. A stable phosphorus atom has an electronic configuration of

**Options :**

1. $1s^2 2s^2 2p^6 3p^5$

2. $1s^2 2s^2 2p^6 3s^2 3p^3$

3. $1s^2 2s^2 2p^6 3s^2 3p^1 4s^2$

4. $1s^2 1p^6 1d^7$

**Question Number : 79  Question Id : 67809418102  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

NaCl is classified as having what kind of bonds in the solid phase?

Options :

1. Covalent

2. Ionic

3. Polar

4. vander Waals

**Question Number : 80 Question Id : 67809418103 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

The Bond formed due to sharing of electrons is

Options :

1. Ionic bond

2. Metallic bond

3. Polar bond

4. Covalent bond

**Question Number : 81 Question Id : 67809418104 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

The normality of solution obtained by dissolving 5.3 grams of $Na_2CO_3$ in 1 litre solution is

Options :

1. 1N

2. 0.1N

3. 0.05N

4. 0.5N

**Question Number : 82 Question Id : 67809418105 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

The following solution has same molarity and normality

**Options :**

1. $Na_2CO_3$

2. $NaCl$

3. $H_2SO_4$

4. $K_2Cr_2O_7$

**Question Number : 83  Question Id : 67809418106  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

5 moles of a solute is dissolved in 10 litres of solution. What is its molarity?

**Options :**

1. 5 M

2. 2M

3. 0.5M

4. 0.2M

**Question Number : 84  Question Id : 67809418107  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Process in which acids ($H^+$) and bases ($OH^-$) react to form salts and water is called

**Options :**

1. Neutralization

2. Halogenation

3. Hydrogenation

4. Hydrolysis

**Question Number : 85  Question Id : 67809418108  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A substance that donates a pair of electrons to form coordinate covalent bond is called

**Options :**

1. Lewis acid

2. Lewis base

3. Bronsted-Lowry acid

4. Bronsted-Lowry base

**Question Number : 86  Question Id : 67809418109  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

One Faraday is equal to

**Options :**

1. 99650 C

2. 93100 C

3. 96500 C

4. 94500 C

**Question Number : 87  Question Id : 67809418110  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The cell reaction of a cell is $Mg(s) + 2 H^+(aq) \rightarrow Mg^{2+}(aq) + H_2(g)$. If the standard reduction potential of Zn is $-2.372$ V, then the emf of the cell is

**Options :**

1. $+2.372$ V

2. $-2.372$ V

3. 0.00 V

4. -1.372 V

**Question Number : 88  Question Id : 67809418111  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Galvanic cells are the cells which convert

Options :

1. Electrical energy to chemical energy

2. Chemical energy to electrical energy

3. Chemical energy to free energy

4. Potential energy to kinetic energy

**Question Number : 89  Question Id : 67809418112  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Mass of substance produced at electrode is directly proportional to the quantity of electricity passed. This is known as

Options :

1. Faraday's second law

2. Faraday's first law

3. Newton's third law

4. Newton's first law

**Question Number : 90  Question Id : 67809418113  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Hardness of water is expressed in terms of equivalent of

Options :

1. $Na_2CO_3$

2. $K_2CO_3$

3. $MgCO_3$

4. $CaCO_3$

**Question Number : 91  Question Id : 67809418114  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Temporary hardness is caused by

**Options :**

1. Carbonates of calcium and magnesium

2. Chlorides of calcium and magnesium

3. Sulphates of calcium and magnesium

4. Nitrates of Calcium

**Question Number : 92  Question Id : 67809418115  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The exhausted zeolite bed can be regenerated by washing with

**Options :**

1. NaCl

2. dil. NaOH

3. dil. HCl

4. Distilled water

**Question Number : 93  Question Id : 67809418116  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Corrosion is an example of

**Options :**

1. Oxidation

2. Reduction

3. Electrolysis

4. Halogenation

The composition of rust is

Options :

1. $Fe(OH)_3$

2. $FeCl_3$

3. $FeO$

4. $Fe_2O_3 . xH_2O$

Which one of the following statement is not true?

Options :

1. Natural rubber has the trans-configuration at every double bond

2. Buna-S is a copolymer of butadiene and styrene

3. Natural rubber is a 1, 4-polymer of isoprene

4. In vulcanization, the formation of sulphur bridges between different chains makes rubber harder and stronger

The monomers of Buna-S rubber are

Options :

1. Styrene and butadiene

2. Styrene and 2-propene

3. Isoprene and butadiene

4. Styrene and sulphur

The plastics which soften when heat is applied with or without pressure, but require cooling to set them to shape are called as

**Options :**

1. Thermosofting materials

2. Thermosetting materials

3. Thermoplastic materials

4. Thermostatting materials

Which one of the following statement is not true about ideal fuel?

**Options :**

1. High calorific value

2. High moisture content

3. Low cost

4. Moderate ignition temperature

Environmental pollution affects

**Options :**

1. Humans only

2. Plants only

3. Biotic components

4. Both abiotic and biotic components

**Question Number : 100  Question Id : 67809418123  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Layer of atmosphere in which ozone layer lies is

**Options :**

1. Troposphere

2. Stratosphere

3. Exosphere

4. Mesosphere

Electronics and Instrumentation Engineering

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| **Number of Questions:** | 100 |
| **Display Number Panel:** | Yes |
| **Group All Questions:** | No |

**Question Number : 101  Question Id : 67809418124  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The armature of DC generator is laminated to _____.

**Options :**

1. increase eddy current loss

2. reduce eddy current loss

3. reduce the bulk

4. provide the bulk

**Question Number : 102  Question Id : 67809418125  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Starters are used with D.C. motors because_____.

**Options :**

1. these motors have high starting torque

2. these motors are not self-starting

3. back e.m.f. of these motors is zero initially

4. to restrict armature current as there is no back e.m.f. while starting

**Question Number : 103  Question Id : 67809418126  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The frequency of domestic power supply in India is _____ Hz.

**Options :**

1. 0

2. 50

3. 60

4. 230

**Question Number : 104  Question Id : 67809418127  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If a circuit contains two unequal resistances in parallel, then
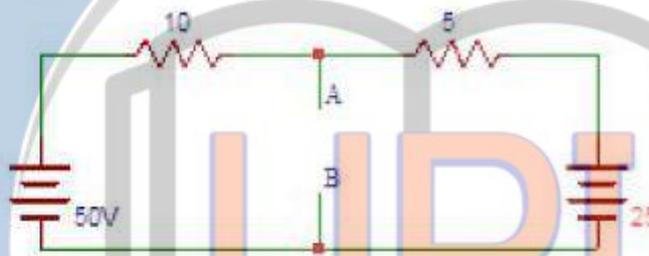
**Options :**

1. current is same in both

2. large current flows in larger resistor

3. potential difference across each is same

4. smaller resistance has smaller potential across it

**Question Number : 105  Question Id : 67809418128  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Determine the equivalent Thevenin's resistance in $\Omega$, between terminals A and B in the circuit shown below.



**Options :**

1. 3.33

2. 5

3. 6.66

4. 15

**Question Number : 106  Question Id : 67809418129  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Kirchhoff's current law is based on law of conservation of _____.

**Options :**

1. Energy

2. momentum

3. mass

4. charge

**Question Number : 107  Question Id : 67809418130  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In a phototransistor the base current is _____.

**Options :**

1. set by bias voltage

2. Directly proportional to light

3. inversely proportional to light

4. Independent of light

**Question Number : 108  Question Id : 67809418131  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is used to detect light intensities which are very weak.

**Options :**

1. Photomultiplier tube

2. Photovoltaic cell

3. Photoemissive tubes

4. Photo reflector

**Question Number : 109  Question Id : 67809418132  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Induction heating is based on the principle of _____.

**Options :**

1. thermal ion release

2. nucleate heating

3. electromagnetic induction

4. resistance heating

**Question Number : 110  Question Id : 67809418133  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Solar cells are made of _____.

**Options :**

1. Steel

2. Iron

3. Aluminum

4. Silicon

**Question Number : 111 Question Id : 67809418134 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

If ultrasonic wave travels at a speed of 350 m/s and the time taken for the wave to travel from transmitter to the other end and back to the transmitter is 20 s, at what distance the target is present?

**Options :**

1. 350m

2. 700m

3. 3500m

4. 7000m

**Question Number : 112 Question Id : 67809418135 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

Time response for a second order system depends on value of $\zeta$. If $\zeta = 0$ then the

system is called as _____.

**Options :**

1. undamped system

2. under damped system

3. critically damped system

over damped system

4.

**Question Number : 113  Question Id : 67809418136  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Transfer function of a system depends on _____.

**Options :**

1. initial conditions of input and output

2. nature of the input

3. nature of the output

4. input and output

**Question Number : 114  Question Id : 67809418137  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A closed loop system differs from an open loop system by _____.

**Options :**

1. servomechanism

2. feedback

3. input signal

4. output signal

**Question Number : 115  Question Id : 67809418138  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If all the roots of a characteristic equation have negative real parts, then the system is _____.

**Options :**

1. stable

2. unstable

3. conditionally stable

4. marginally stable

**Question Number : 116  Question Id : 67809418139  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Zener diode is used as _____.

**Options :**

1. Current regulator

2. Voltage regulator

3. Voltage booster

4. Power booster

**Question Number : 117  Question Id : 67809418140  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The resistance of a semiconductor material _____ with increase in temperature.

**Options :**

1. increases

2. decreases

3. does not change

4. first increases and then decreases

**Question Number : 118  Question Id : 67809418141  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The relation between emitter current ($I_E$), base current ($I_B$) and collector current ($I_C$) in a transistor is given by _____.

**Options :**

1. $I_E = I_B + I_C$

2. $I_C = I_B + I_E$

3. $I_B = I_E + I_C$

4. $I_E + I_B + I_C = 1$

**Question Number : 119 Question Id : 67809418142 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

_____ transistor configuration is referred to as emitter follower.

**Options :**

1. Common emitter

2. Common base

3. Common collector

4. Common anode

**Question Number : 120 Question Id : 67809418143 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

A p-n junction allows current flow when _____.

**Options :**

1. both p and n type materials are at same potential

2. there is no potential between p and n type materials

3. n type material is more positive than p type material

4. p type material is more positive than n type material

**Question Number : 121 Question Id : 67809418144 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

_____ is used as a relaxation oscillator.

**Options :**

1. UJT

2. FET

3. MOSFET

4. SCR

**Question Number : 122  Question Id : 67809418145  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

An astable multivibrator is also known as _____ multivibrator.

**Options :**

1. monostable

2. one shot

3. bistable

4. free running

**Question Number : 123  Question Id : 67809418146  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The number of RC stages in a RC phase shift oscillator are _____.

**Options :**

1. 1

2. 2

3. 3

4. 4

**Question Number : 124  Question Id : 67809418147  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Voltage across a forward biased diode is _____.

**Options :**

1. Zero

2. Infinite

3. Diode barrier potential

4. Battery voltage

**Question Number : 125  Question Id : 67809418148  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

An oscillator differs from an amplifier because it _____ .

**Options :**

1. has more gain

2. requires no input signal

3. requires no dc supply

4. always has the same input

**Question Number : 126  Question Id : 67809418149  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

An oscillator circuit has _____ .

**Options :**

1. positive feedback

2. negative feedback

3. no feedback

4. either positive or negative feedback

**Question Number : 127  Question Id : 67809418150  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Cross over distortion is a problem in _____ amplifiers.

**Options :**

1. Class A

2. Class B

3. Class C

4. Class D

**Question Number : 128  Question Id : 67809418151  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

If all the inputs are low the output is high for _____ logic gate.

**Options :**

1. AND

2. OR

3. XOR

4. NAND

**Question Number : 129  Question Id : 67809418152  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Convert $(41)_{10}$ to $(_____)_2$.

**Options :**

1. 00101001

2. 01000001

3. 10010100

4. 11110001

**Question Number : 130  Question Id : 67809418153  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**
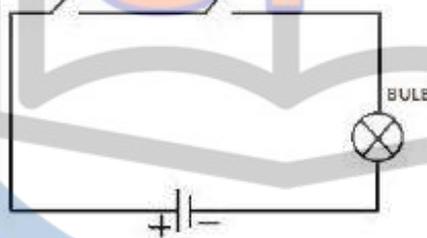
The number of inputs given for a D flip-flop is _____.

**Question Number : 131  Question Id : 67809418154  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The logic gate represented by the circuit shown below is _____ .



**Options :**

1. NAND

2. NOR

3. AND

4. OR

**Question Number : 132  Question Id : 67809418155  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ characteristic of RAM memory makes it not suitable for permanent storage.

**Options :**

1. Non volatile

2. Too slow

3. Too bulky

4. Volatile.

Sample and hold circuit is required for which of the following?

**Options :**

1. ADC

2. DAC

3. Counter

4. Adder

Which of the following is an invalid state in a BCD counter?

**Options :**

1. 0110

2. 1111

3. 0010

4. 0100

The resolution of 8 bit ADC is _____.

**Options :**

1. 8

2. 16

3. 64

4. 256

**Question Number : 136  Question Id : 67809418159  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

An 8 bit successive approximation analog to digital converter has full scale reading of 2.55 V and its conversion time for an analog input of 1V is 20μs. The conversion time for a2V input will be_____.

**Options :**

1. 10 μs

2. 20 μs

3. 40 μs

4. 80 μs

**Question Number : 137  Question Id : 67809418160  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The number of resistors required for an N bit DAC is 2N in the case of _____DAC.

**Options :**

1. Binary weighted

2. Successive approximation

3. R-2R ladder

4. Dual slope

**Question Number : 138  Question Id : 67809418161  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The range of an ammeter is _____.

**Options :**

1. increased by increasing the value of shunt resistance

2. increased by decreasing the value of shunt resistance

3. decreased by decreasing the value of shunt resistance

4. independent of shunt resistance

**Question Number : 139  Question Id : 67809418162  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The waveforms for the measurement of frequency and phase using a CRO are called _____.

**Options :**

1. Lissajous patterns

2. Sine waveforms

3. Cosine waveforms

4. Sawtooth waveforms

**Question Number : 140  Question Id : 67809418163  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

CRO gives the visual representation of time varying signals. The display of the signal is _____.

**Options :**

1. one  dimensional

2. two dimensional

3. three dimensional

4. four dimensional

**Question Number : 141  Question Id : 67809418164  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A Q-meter is used to measure _____.

**Options :**

1. Electrical properties of capacitors only

2. Mechanical properties of coils only

3. Electrical properties of both coils and capacitors

4. Electrical properties of resistor

**Question Number : 142  Question Id : 67809418165  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A spectrum analyzer measures the amplitude of an input signal vs _____.

**Options :**

1. time

2. amplitude of output signal

3. amplitude of another input signal

4. frequency

**Question Number : 143  Question Id : 67809418166  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is an electronic instrument that captures and displays multiple signals from a digital circuit.

**Options :**

1. Spectrum analyzer

2. Logic analyzer

3. Frequency meter

4. Oscillator

**Question Number : 144  Question Id : 67809418167  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The instrument which measures difference between the known and unknown voltage source is known as _____.

Options :

1. voltmeter

2. differential voltmeter

3. differential amplifier

4. multimeter

**Question Number : 145  Question Id : 67809418168  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

FET voltmeters have _____.

Options :

1. high input impedance and low loading effect

2. high input impedance and high loading effect

3. low input impedance and low loading effect

4. low input impedance and high loading effect

**Question Number : 146  Question Id : 67809418169  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is the difference between the largest and smallest reading of an instrument.

Options :

1. precision

2. resolution

3. range

4. span

_____ is defined as the largest change in input quantity for which there is no output in the instrument.

**Options :**

1. precision

2. resolution

3. dead zone

4. threshold

LVDT is used for the measurement of _____.

**Options :**

1. Linear displacement

2. Angular displacement

3. Voltage

4. Temperature

The SI unit of angular velocity is _____.

**Options :**

1. meters per second

2. meters per hour

3. radians per second

4. radians per hour

Scientific definition of pH is negative logarithm to base 10 of_____.

**Options :**

1. $H^+$ ion concentration

2. $OH^-$ ion concentration

3. $O^+$ ion concentration

4. power of hydroxyl group

The instrument used to measure humidity is _____.

**Options :**

1. Rotameter

2. Hygrometer

3. LVDT

4. Thermometer

Which one of the following is an active transducer.

**Options :**

1. RTD

2. Thermistor

3. Potentiometer

4. Thermocouple

**Question Number : 153  Question Id : 67809418176  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A Reynold's number of 1000 indicates_____.

**Options :**

1. Laminar flow

2. turbulent flow

3. normal flow

4. neither turbulent nor laminar

**Question Number : 154  Question Id : 67809418177  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ do not put any obstruction in the flow of fluid through them.

**Options :**

1. Electromagnetic flow meter

2. Rotameter

3. Venturi meter

4. Orifice plate flow meter

**Question Number : 155  Question Id : 67809418178  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

For flow measurement the rotameter can be installed in pipeline _____.

**Options :**

1. Horizontally with flow inlet in a specific direction

2. Horizontally with flow inlet in any direction

3. Vertically with flow inlet at the bottom and outlet at the top

4. Vertically with flow inlet at the top and outlet at the bottom

**Question Number : 156  Question Id : 67809418179  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A hotwire anemometer is a device used to measure _____ .

**Options :**

1. Temperature

2. Pressure in gases

3. Liquid discharge

4. Gas velocities

**Question Number : 157  Question Id : 67809418180  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is a measure of a fluid's resistance to flow.

**Options :**

1. Density

2. Viscosity

3. Conductivity

4. Humidity

**Question Number : 158  Question Id : 67809418181  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Piezoelectric crystal is generally employed for the measurement of which of the following?

**Options :**

1. Flow

2. Velocity

3. Acceleration

4. Temperature

**Question Number : 159  Question Id : 67809418182  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The SI unit of conductivity is _____.

**Options :**

1. Siemens per meter

2. Newton per meter

3. litres per meter

4. Kg per cm

**Question Number : 160  Question Id : 67809418183  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Flapper nozzle is used in a/an _____ controller.

**Options :**

1. hydraulic

2. electronic

3. pneumatic

4. hydro-electronic

**Question Number : 161  Question Id : 67809418184  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Which of the following controller has maximum offset?

**Options :**

1. Proportional controller

2.  Proportional-Integral controller

3.  Proportional-Integral-Derivative controller

4.  Proportional-Derivative controller

**Question Number : 162  Question Id : 67809418185  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In process control error signal is the difference between _____.

**Options :**

1.  setpoint and manipulated variable

2.  setpoint and process variable

3.  manipulated variable and process variable

4.  manipulated variable and controlled variable

**Question Number : 163  Question Id : 67809418186  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ control action responds to the rate at which the error is changing.

**Options :**

1.  Proportional

2.  Integral

3.  Derivative

4.  Proportional-Integral

**Question Number : 164  Question Id : 67809418187  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The most common analog signal standard of current for industrial process instruments is _____.

Options :

1. 0 to 4mA

2. 0 to 20mA

3. 4 to 20 mA

4. 3 to 15 mA

**Question Number : 165 Question Id : 67809418188 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

In letter codes, the second letter is to identify _____.

Options :

1. measured value

2. modifier

3. function modifier

4. readout function

**Question Number : 166 Question Id : 67809418189 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

Identify the following P&ID line types from left to right.



Options :

1. pneumatic, capillary, electric, hydraulic

2. electric, capillary, hydraulic, pneumatic

3. capillary, hydraulic, pneumatic, electric

4. pneumatic, electric, capillary, hydraulic

**Question Number : 167  Question Id : 67809418190  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The controller in which a primary or master controller generates a control effort that serves as the set point for a secondary or slave controller is _____.

**Options :**

1. Adaptive controller

2. cascade controller

3. pneumatic controller

4. ratio controller

**Question Number : 168  Question Id : 67809418191  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The Laplace Transform of a 4 second transportation lag element is

**Options :**

1. $e^{-4s}$

2. $1/(s+4)$

3. $e^{4s}$

4. $e^{-s/4}$

**Question Number : 169  Question Id : 67809418192  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

CNC stands for _____.

**Options :**

1. Central Number Control

2. Central Numeric Center

3. Computer Number Control

4. Computer Numeric Control

**Question Number : 170  Question Id : 67809418193  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is used to maintain the flow rate of one stream in a process at a defined or specified proportion relative to that of another.

**Options :**

1. Adaptive controller

2. Cascade controller

3. Ratio controller

4. Pneumatic controller

**Question Number : 171  Question Id : 67809418194  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Which of the following is not a continuous controller mode?

**Options :**

1. Proportional

2. Integral

3. Derivative

4. On-Off

**Question Number : 172  Question Id : 67809418195  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

A part of the final control element that translates the control signal into action of the final control device in the process is called _____.

**Options :**

1. actuator

2. accelerometer

3. sensor

4. integrator

**Question Number : 173  Question Id : 67809418196  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Proportional band is given by _____.

**Options :**

1. $K_p/100$

2. $100/ \ K_p$

3. $1/K_p$

4. $K_p$

**Question Number : 174  Question Id : 67809418197  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In TV system, picture and sound respectively use _____.

**Options :**

1. AM, FM

2. FM, FM

3. FM, AM

4. AM, AM

**Question Number : 175  Question Id : 67809418198  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The circuit whose output is proportional to difference between the input signals is _____ amplifier.

**Options :**

1. common mode

2. darlington

3. differential

4. operational

**Question Number : 176  Question Id : 67809418199  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In amplitude modulation, the _____ of carrier is varied according to the strength of the signal.

**Options :**

1. frequency

2. amplitude

3. phase

4. velocity

**Question Number : 177  Question Id : 67809418200  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The full form of CMRR is _____.

**Options :**

1. Central Mode Rejection Rate

2. Central Mode Rejection Ratio

3. Common Mode Rejection Rate

4. Common Mode Rejection Ratio

**Question Number : 178  Question Id : 67809418201  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The gain of voltage follower is _____.

**Options :**

1. 1

2. 100

3. 1000

4. infinity

**Question Number : 179  Question Id : 67809418202  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**
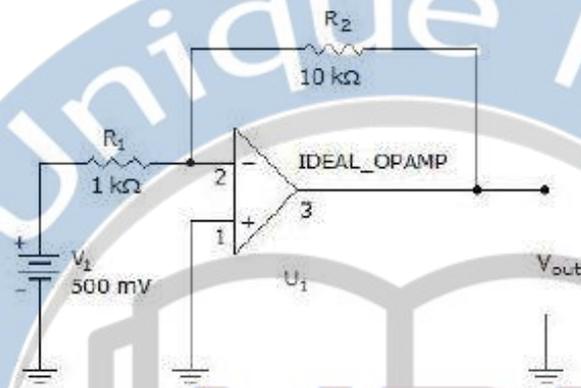
If the input is a square wave, the output of the circuit is _____ wave.
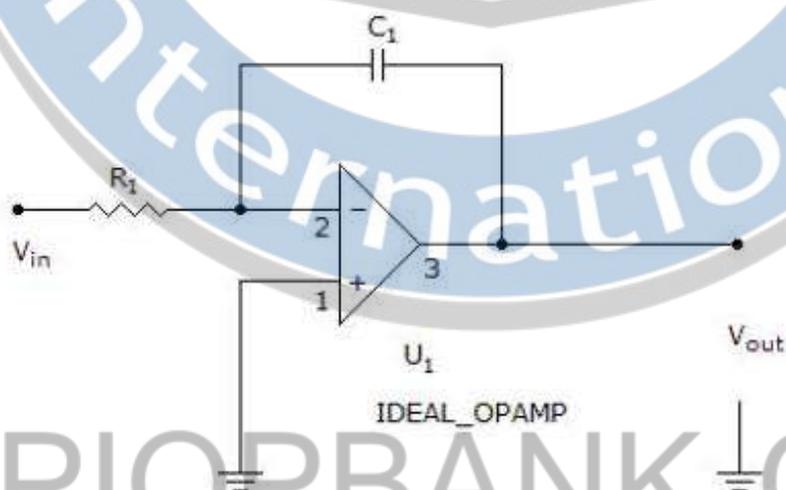


**Options :**

1. sine

2. square

3. triangle

4. saw tooth

**Question Number : 180  Question Id : 67809418203  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Find the output voltage for the given circuit.



**Options :**

1. 5V

2. -5V

3. 50mV

4. -50mV

_____is a comparator circuit with hysteresis implemented by applying positive

feedback to the noninverting input of a comparator or differential amplifier.

**Options :**

1. Wein bridge oscillator

2. Integrator

3. Multivibrator

4. Schmitt trigger

Beer-Lambert law states that the quantity of light absorbed by a substance dissolved in a fully transmitting solvent is _____.

**Options :**

1. indirectly proportional to the concentration of the substance and the path length of the light through the solution

2. directly proportional to the concentration of the substance only

3. directly proportional to the concentration of the substance and the path length of the light through the solution

4. directly proportional to the path length of the light through the solution only

**Question Number : 183  Question Id : 67809418206  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In electromagnetic spectrum, which of the following sequence gives the wave length from the lowest to the highest?

**Options :**

1. Gamma ray, X-ray, UV, Visible

2. UV, Visible, Gamma ray, X-ray

3. X-ray, Gamma ray, Visible, UV

4. Visible, X-ray, Gamma ray, UV

**Question Number : 184  Question Id : 67809418207  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is an instrument which takes advantage of Luminescence properties of some compounds in order to provide information regarding their concentration.

**Options :**

1. Flame photometer

2. Spectroflourometer

3. Polarimeter

Gas chromatograph

4.

**Question Number : 185  Question Id : 67809418208  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In _____ the intensity of light emitted is related to the concentration of the element.

**Options :**

1. Mass spectrometer

2. Flame photometer

3. Polarimeter

4. Gas chromatograph

**Question Number : 186  Question Id : 67809418209  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ instrument uses the technique in which sample is converted into rapidly moving positive ions  by electron bombardment and charged particles are separated according to their masses.

**Options :**

1. Polarimeter

2. UV-Visible spectrophotometer

3. Mass spectrometer

4. Gas chromatograph

**Question Number : 187  Question Id : 67809418210  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

In photometers, the initial readings of the specimen are related to  which of the

following parameters?

**Options :**

1. Volume

2. Wave Length

3. Absorption

4. Transmittance

**Question Number : 188  Question Id : 67809418211  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ generates an electrical stimulus regularly that causes heart muscles to contract and expand.

**Options :**

1. Atria

2. Ventricles

3. ECG

4. SA node

**Question Number : 189  Question Id : 67809418212  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Computer aided tomography is used _____.

**Options :**

1. for taking medical images

2. to know the electrical activity of heart

3. to know the electrical activity of brain

4. for correcting irregularities of heart

**Question Number : 190  Question Id : 67809418213  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ is a device which is used to give electric shock to the heart to stop an extremely rapid , irregular heartbeat and restore the normal rhythm.

**Options :**

1. Pacemaker

2. Defibrillator

3. Computer aided tomography

4. X-ray machine

**Question Number : 191  Question Id : 67809418214  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Choose the word which is not assigned to identify the frequency of EEG.

**Options :**

1. Alpha

2. Beta

3. Gamma

4. Delta

**Question Number : 192  Question Id : 67809418215  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The principle of Doppler effect is used for the measurement of _____.

**Options :**

1. Blood pressure

2. electrical activity of heart

3. electrical activity of brain

4. blood flow

**Question Number : 193  Question Id : 67809418216  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The numbers of timers present in 8051 microcontroller are _____.

**Options :**

1. 2

2. 3

3. 4

4. 6

**Question Number : 194  Question Id : 67809418217  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

DMA stands for _____.

**Options :**

1. Data Memory Address

2. Data Memory Access

3. Direct Memory Access

4. Direct Main Address

**Question Number : 195  Question Id : 67809418218  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

_____ I/O ports of 8051 microcontroller provide address and data when external memory is interfaced.

**Options :**

1. P0&P1

2. P0&P2

3. P!&P2

4. P1&P3

**Question Number : 196  Question Id : 67809418219  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The instruction MUL works only on _____ registers of 8051 microcontroller.

**Options :**

1. A& R0

2. R0&R1

3. A&B

4. A&R1

**Question Number : 197  Question Id : 67809418220  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The number of I/O ports present in 8255 programmable peripheral interface is _____.

**Options :**

1. 2

2. 3

3. 4

4. 5

**Question Number : 198  Question Id : 67809418221  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Programmable logic controllers are programmed using _____.

**Options :**

1. Ladder diagram

2. C language

3. Assembly language

4. High level language

**Question Number : 199  Question Id : 67809418222  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

The cycle time of a PLC is the time it takes to_____.

**Options :**

1. Read an input signal.

2. Read all the input signals

3. Check all the input signals against the program

4. Read all the inputs, run the program and update all outputs

**Question Number : 200  Question Id : 67809418223  Display Question Number : Yes  Single Line Question Option : No  Option Orientation : Vertical**

Which of the following statement is not true?

**Options :**

1. The vertical lines of the diagram represent the power rails

2. Each rung defines one operation in the control process

3. A ladder diagram is read from left to right

4. A ladder diagram is read from right to left