# Andhra Pradesh State Council of Higher Education

**Notations :**

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

| | |
|---|---|
| **Question Paper Name :** | Electronics and Instrumentation Engineering 22nd July 2022 Shift 2 |
| **Duration :** | 180 |
| **Total Marks :** | 200 |
| **Display Marks:** | No |
| **Share Answer Key With Delivery Engine :** | Yes |
| **Calculator :** | None |
| **Magnifying Glass Required? :** | No |
| **Ruler Required? :** | No |
| **Eraser Required? :** | No |
| **Scratch Pad Required? :** | No |
| **Rough Sketch/Notepad Required? :** | No |
| **Protractor Required? :** | No |
| **Show Watermark on Console? :** | Yes |
| **Highlighter :** | No |
| **Auto Save on Console?** | Yes |
| **Change Font Color :** | No |
| **Change Background Color :** | No |
| **Change Theme :** | No |
| **Help Button :** | No |
| **Show Reports :** | No |
| **Show Progress Bar :** | No |
| **Is this Group for Examiner? :** | No |
| **Examiner permission :** | Cant View |



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**Show Progress Bar? :** No

# Mathematics

| | |
|---|---|
| **Section Id :** | 722544108 |
| **Section Number :** | 1 |
| **Mandatory or Optional :** | Mandatory |
| **Number of Questions :** | 50 |
| **Section Marks :** | 50 |
| **Enable Mark as Answered Mark for Review and Clear Response :** | Yes |
| **Maximum Instruction Time :** | 0 |

**Question Number : 1 Question Id : 7225445402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

If $A=\begin{bmatrix}\cos\theta & -\sin\theta\\ \sin\theta & \cos\theta\end{bmatrix}$ then $A^T+A=I_2$ if

**Options :**

1. ✖ $\theta=n\pi, n\in Z$

2. ✖ $\theta=(2n+1)\frac{\pi}{2}, n\in Z$

3. ✔ $\theta=2n\pi\pm\frac{\pi}{3}, n\in Z$



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4. ✖ $\theta = (2n+1)\frac{\pi}{4}, n \in Z$

**Question Number : 2 Question Id : 7225445403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

If for the matrix A, $A^3 = I$ then $A^{-1} =$

**Options :**

1. ✔ $A^2$

2. ✖ $A^3$

3. ✖ $A$

4. ✖ $A^4$

**Question Number : 3 Question Id : 7225445404 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The value of $\lambda$ for which the system of equations
$x+y+z=6$ , $x+2y+3z=10$ , $x+2y+\lambda z=12$ is inconsistent is

**Options :**

1. ✖ $\lambda = 1$



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2. ✖ $\lambda = 2$

3. ✖ $\lambda = -2$

4. ✔ $\lambda = 3$

**Question Number : 4 Question Id : 7225445405 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

If $A=\begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ *then the value of* $|adj\ A|$ *is*

**Options :**

1. ✖ $a^{27}$

2. ✖ $a^{9}$

3. ✔ $a^{6}$

4. ✖ $a^{2}$

**Question Number : 5 Question Id : 7225445406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response**



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**Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If\ A+2B=\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}\ and\ 2A-B=\begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}$$ then $tr(A)-\text{tr}(B)$ value equal

to

**Options :**

1. ✖ 0

2. ✖ 1

3. ✔ 2

4. ✖ 3

**Question Number : 6 Question Id : 7225445407 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$\frac{2x+3}{(x+1)(x-3)}=\frac{a}{(x+1)}+\frac{b}{(x-3)}then\ \ 2a+3b=$$

**Options :**

1. ✖ 14



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2. ✖ 12

3. ✔ 25/4

4. ✖ −12

**Question Number : 7 Question Id : 7225445408 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The Number of partial fractions of* $\frac{3x^2+70x+93}{(x-1)^4}$ *is*

**Options :**

1. ✔ 3

2. ✖ 4

3. ✖ 5

4. ✖ 2

**Question Number : 8 Question Id : 7225445409 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*Given that* $A=\sin^2\theta+\cos^4\theta$, *then for all real values of* $\theta$



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**Options :**

1. ✖ $1 \leq A \leq 2$

2. ✔ $\frac{3}{4} \leq A \leq 1$

3. ✖ $\frac{13}{16} \leq A \leq 1$

4. ✖ $\frac{3}{4} \leq A \leq \frac{13}{16}$

**Question Number : 9 Question Id : 7225445410 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$If \tan\theta = -\frac{4}{3}$ , $then$ $\sin\theta =$

**Options :**

1. ✖ $-\frac{4}{5}$ *but not* $\frac{4}{5}$

2. ✔ $-\frac{4}{5}$ *or* $\frac{4}{5}$



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3. ✖ $\frac{4}{5}\ but\ not\ -\frac{4}{5}$

4. ✖ $-\frac{3}{5}\ but\ not\ \frac{3}{5}$

**Question Number : 10 Question Id : 7225445411 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The general solution of*

$\sin x - 3\sin 2x + \sin 3x = \cos x - 3\cos 2x + \cos 3x$ *is*

**Options :**

1. ✖ $n\pi + \frac{\pi}{8}$

2. ✔ $\frac{n\pi}{2} + \frac{\pi}{8}$

3. ✖ $(-1)^n \frac{n\pi}{2} + \frac{\pi}{8}$

4. ✖ $2n\pi + \cos^{-1}\frac{3}{2}$



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**Question Number : 11 Question Id : 7225445412 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*If* $x, y, z$ *are in AP and* $\tan^{-1} x, \tan^{-1} y$ *and* $\tan^{-1} z$ *are also in AP then*

**Options :**

1. ✓ $x = y = z$

2. ✗ $2x = 3y = 6z$

3. ✗ $6x = 3y = 2z$

4. ✗ $6x = 4y = 3z$

**Question Number : 12 Question Id : 7225445413 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*If* $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$ *then* $x =$

**Options :**

1. ✓ $\frac{1}{6}$



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2. ✖ $\frac{1}{3}$

3. ✖ $\frac{1}{2}$

4. ✖ $\frac{3}{2}$

**Question Number : 13 Question Id : 7225445414 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The sides of a triangle are in the ratio $1:\sqrt{3}:2$ then the angles of the triangle are in the ratio

**Options :**

1. ✖ $1:3:5$

2. ✖ $2:3:2$

3. ✖ $3:2:1$

4. ✔ $1:2:3$



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**Question Number : 14 Question Id : 7225445415 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$Let\ \cos(\alpha+\beta)=\frac{4}{5}\ and\ \sin(\alpha-\beta)=\frac{5}{13}\ where\ 0<\alpha,\beta\le\frac{\pi}{4},\ then\ \tan 2\alpha=$$

**Options :**

1. ✖ $\frac{19}{12}$

2. ✖ $\frac{20}{7}$

3. ✖ $\frac{25}{16}$

4. ✔ $\frac{56}{33}$

**Question Number : 15 Question Id : 7225445416 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If\ 1+\sin x+\sin^2 x+\sin^3 x+....\infty\ =4+2\sqrt{3}\ ,\quad 0<x<\pi,\ then\ x=$$

**Options :**

1. ✖ $\frac{\pi}{6}$



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2. ✖ $\frac{\pi}{4}$

3. ✔ $\frac{2\pi}{3}$

4. ✖ $\frac{3\pi}{4}$

**Question Number : 16 Question Id : 7225445417 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The angles of a triangle are in the ratio 3:5:10 then the ratio of the smallest side to the greatest side is

**Options :**

1. ✖ $1:\sin 10°$

2. ✖ $1:\ 2\sin 10°$

3. ✖ $1:\cos 10°$

4. ✔ $1:\ 2\cos 10°$



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**Question Number : 17 Question Id : 7225445418 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$If\ \sin^{-1}x+\sin^{-1}y=\frac{2\pi}{3}\ then\ \cos^{-1}x+\cos^{-1}y=$

**Options :**

1. ✘ $\frac{2\pi}{3}$

2. ✔ $\frac{\pi}{3}$

3. ✘ $\frac{\pi}{6}$

4. ✘ $\pi$

**Question Number : 18 Question Id : 7225445419 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The conjugate of a complex number is $\frac{1}{i-1}$, then that complex number is

**Options :**



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1. ✔ $\frac{-1}{i+1}$

2. ✖ $\frac{1}{i-1}$

3. ✖ $\frac{-1}{i-1}$

4. ✖ $\frac{1}{i+1}$

**Question Number : 19 Question Id : 7225445420 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The value of* $\frac{(\sin\ \pi/8 + i\cos\ \pi/8)^8}{(\sin\ \pi/8 - i\cos\ \pi/8)^8} =$

**Options :**

1. ✖ $-1$

2. ✖ $0$



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3. ✓ 1

4. ✗ $2i$

**Question Number : 20 Question Id : 7225445421 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The lines* $2x-3y-5=0$ *and* $3x-4y=7$ *are diameters of a circle of area* $49\pi$ *sq.units, then the equation of the circle is*

**Options :**

1. ✗ $x^2+y^2+2x-2y-62=0$

2. ✗ $x^2+y^2+2x-2y-47=0$

3. ✓ $x^2+y^2-2x+2y-47=0$

4. ✗ $x^2+y^2-2x+2y-62=0$

**Question Number : 21 Question Id : 7225445422 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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*If the* point $(a,-a)$ *lies inside the circle* $x^2+y^2-4x+2y-8=0$, then $'a'$ *lies in the* interval

**Options :**

1. ✔ $(-1,4)$

2. ✖ $(-\infty,-1)$

3. ✖ $(4,\infty)$

4. ✖ $[-1,4]$

**Question Number : 22 Question Id : 7225445423 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The focus of the parabola* $y^2-4y-8x+4=0$ *is*

**Options :**

1. ✖ $(1,1)$

2. ✖ $(1,2)$

3. ✖ $(2,1)$



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4. ✔ $(2,2)$

**Question Number : 23 Question Id : 7225445424 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The equation* $\frac{x^2}{10-a}+\frac{y^2}{4-a}=1$ *represents an ellipse if*

**Options :**

1. ✔ $a<4$

2. ✘ $a>4$

3. ✘ $4<a<10$

4. ✘ $a>10$

**Question Number : 24 Question Id : 7225445425 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The vertices of the hyperbola* $9x^2-16y^2-36x+96y-252=0$, *are*

**Options :**

1. ✘ $(6,3)$ *and* $(-6,3)$



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2. ✔ $(6,3)$ *and* $(-2,3)$

3. ✖ $(-6,3)$ *and* $(-6,-3)$

4. ✖ $(0, \pm\frac{2}{3})$

**Question Number : 25 Question Id : 7225445426 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The eccentricity of the hyperbola with latus rectum* 12 *and semi conjugate axis* $2\sqrt{3}$ *is*

**Options :**

1. ✔ $2$

2. ✖ $3$

3. ✖ $\sqrt{3}/2$

4. ✖ $2\sqrt{3}$

**Question Number : 26 Question Id : 7225445427 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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The side of an equilateral triangle expands at the rate of 2 cm/sec, the rate of increase of its area when each side is 10 cm (in $cm^2$/sec)

**Options :**

1. ✖ $10\sqrt{2}$

2. ✖ $10\sqrt{3}$

3. ✔ 10

4. ✖ 5

**Question Number : 27 Question Id : 7225445428 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

If f (x+y) = f(x) f(y), for all x,y. f(5) = 2, $f'(0)=3$, then $f'(5)=$

**Options :**

1. ✔ 6

2. ✖ 2

3. ✖ 3



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4. ✖ 5

**Question Number : 28 Question Id : 7225445429 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$\lim_{x\to\infty}\left[\frac{x^2+2x-1}{2x^2-3x-2}\right]^{\frac{2x+1}{2x-1}} \text{ is equal to}$$

**Options :**

1. ✖ 0

2. ✖ $\infty$

3. ✔ 1/2

4. ✖ 1/3

**Question Number : 29 Question Id : 7225445430 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$\lim_{x\to 0}\frac{\sin^2 mx}{\tan^2 nx} \text{ is equal to}$$

**Options :**

1. ✖ m/n



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2. ✖ $m^2.n^2$

3. ✔ $m^2/n^2$

4. ✖ $n^2/m^2$

**Question Number : 30 Question Id : 7225445431 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$If\ \ f(x)=\left|x^2-5x+6\right|\ \ then\ \ f'(x)=$

**Options :**

1. ✖ $2x-5 \quad for \ \ 2<x<3$

2. ✔ $5-2x \quad for \ \ 2<x<3$

3. ✖ $2x-5 \quad for \ \ x>2$

4. ✖ $5-2x \quad for \ \ x<3$

**Question Number : 31 Question Id : 7225445432 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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If $y = \log_y x$, then $\frac{dy}{dx} =$

**Options :**

1. ✔ $\frac{1}{x(1+\log y)}$

2. ✘ $\frac{1}{x+\log y}$

3. ✘ $\frac{1}{\log x(1+y)}$

4. ✘ $\frac{1}{y+\log x}$

**Question Number : 32 Question Id : 7225445433 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The angle between* tangents *to the curve* $y = x^2 - 5x + 6$ *at the* points $(2,0)$ and $(3,0)$ is

**Options :**



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1. ✖ $\frac{\pi}{3}$

2. ✔ $\frac{\pi}{2}$

3. ✖ $\frac{\pi}{6}$

4. ✖ $\frac{\pi}{4}$

**Question Number : 33 Question Id : 7225445434 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*If errors of* 1% *is made in the base radius and height of a cylinder then the percentage error in its volume is*

**Options :**

1. ✖ 1%

2. ✖ 2%

3. ✔ 3%



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4. ✖ 4%

**Question Number : 34 Question Id : 7225445435 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$The\ value\ of\ 'a'\ for\ which\ the\ function\ f(x) = a\sin x + \frac{1}{3}\sin 3x$$

$$has\ \ an\ \ extremum\ \ at\ x = \frac{\pi}{3}\ is$$

**Options :**

1. ✖ 1

2. ✖ −1

3. ✖ 0

4. ✔ 2

**Question Number : 35 Question Id : 7225445436 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If\ \ u = x^y\ \ then\ \frac{\partial^2 u}{\partial x \partial y} =$$

**Options :**



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1. ✖ $x^{y-1}(1+x\log y)$

2. ✖ $y^{x-1}(1+y\log x)$

3. ✔ $x^{y-1}(1+y\log x)$

4. ✖ $x^{y+1}(1-y\log x)$

**Question Number : 36 Question Id : 7225445437 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The value of* $\int e^{\sin^{-1}x}\frac{1}{\sqrt{1-x^2}}dx$

**Options :**

1. ✖ $2e^{\sin^{-1}x}+c$

2. ✔ $e^{\sin^{-1}x}+c$

3. ✖ $e^{\sin x}+c$

4. ✖ $e^{\cos^{-1}x}+c$



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**Question Number : 37 Question Id : 7225445438 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If \int \frac{4x+1}{x^2+3x+2}dx = a\log|x+1| + b\log|x+2| + C, \ then$$

**Options :**

1. ✖ $a = b$

2. ✔ $a + b = 4$

3. ✖ $a = 2b$

4. ✖ $b = 2a$

**Question Number : 38 Question Id : 7225445439 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$\int \frac{\cos 2x}{(\sin x + \cos x)^2}dx =$$

**Options :**

1. ✖ $-\frac{1}{\sin x + \cos x} + c$



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2. ✔ $\log|\sin x+\cos x|+c$

3. ✖ $\log|\sin x-\cos x|+c$

4. ✖ $(\sin x+\cos x)^2+c$

**Question Number : 39 Question Id : 7225445440 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$If\ \int f(x)dx=2(f(x))^3+C\ \ then\ \ f(x)=$

**Options :**

1. ✖ $\frac{x}{2}$

2. ✖ $x^3$

3. ✖ $\frac{1}{\sqrt{x}}$

4. ✔ $\sqrt{\frac{x}{3}}$



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**Question Number : 40 Question Id : 7225445441 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If \int e^{ax}\cos bx\ dx = \frac{e^{2x}}{29}f(x)+C,\ then\ f''(x) =$$

**Options :**

1. ✖ $29f(x)$

2. ✖ $-29f(x)$

3. ✖ $25f(x)$

4. ✔ $-25f(x)$

**Question Number : 41 Question Id : 7225445442 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$The\ value\ of\ x\ in \int_{\sqrt{2}}^{x} \frac{1}{t\sqrt{t^2-1}}dt = \frac{\pi}{2}\ is$$

**Options :**

1. ✖ $\frac{\sqrt{3}}{2}$



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2. ✖ $2\sqrt{2}$

3. ✖ $2$

4. ✔ $-\sqrt{2}$

**Question Number : 42 Question Id : 7225445443 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The value of* $\int_0^1 \frac{(\sin^{-1} x)^2}{\sqrt{1-x^2}} dx$

**Options :**

1. ✔ $\frac{\pi^3}{24}$

2. ✖ $\frac{\pi^3}{48}$

3. ✖ $\frac{\pi^3}{64}$

4. ✖ $\frac{\pi^3}{12}$



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**Question Number : 43 Question Id : 7225445444 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$$If\ f(x)\ is\ a\ polynomial\ of\ \text{degree}\ 2\ satisfying\ f(0)=1,$$

$$f'(0)=-2\ and\ f''(0)=6\ then\ \int_{-1}^{2} f(x)dx =$$

**Options :**

1. ✖ 6

2. ✖ 0

3. ✔ 9

4. ✖ $-8$

**Question Number : 44 Question Id : 7225445445 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The degree of the differential equation $a^2\frac{d^2y}{dx^2}=\left[1+\left(\frac{dy}{dx}\right)^2\right]^{3/2}$ *is*

**Options :**

1. ✔ 2

2. ✖ 1



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3. ✖ 3

4. ✖ 4

**Question Number : 45 Question Id : 7225445446 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

$\log\left(\frac{y}{x}\right) = cx$, where c is abitrary constant is a solution of the differential equation

**Options :**

1. ✔ $\log\left(\frac{y}{x}\right) = \frac{x}{y}\frac{dy}{dx} - 1$

2. ✖ $\log\left(\frac{x}{y}\right) = \frac{x}{y}\frac{dy}{dx} - 1$

3. ✖ $\log\left(\frac{x}{y}\right) = \frac{y}{x}\frac{dy}{dx} + 1$

4. ✖ $\frac{dy}{dx} = 1 + \log\left(\frac{y}{x}\right)$



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**Question Number : 46 Question Id : 7225445447 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

*The solution of the differential equation* $\cos\theta\, dr - r\sin\theta\, d\theta = 0$ *is*

**Options :**

1. ✓ $r\cos\theta = c$ , $c-$arbitrary constant

2. ✗ $r\sin\theta = c$ , $c-$arbitrary constant

3. ✗ $r\cos\theta + r\sin\theta = c$, $c-$arbitrary constant

4. ✗ $r^2\cos 2\theta = c$ , $c-$arbitrary constant

**Question Number : 47 Question Id : 7225445448 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The degree of $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^2 = x\sin\frac{dy}{dx}$ is

**Options :**

1. ✗ 1

2. ✗ 2

3. ✗ 3



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4. ✓ Not defined

**Question Number : 48 Question Id : 7225445449 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The complimenary function of the differential equation $\frac{d^2y}{dx^2}+4\frac{dy}{dx}+3y=e^{2x}$ *is*

**Options :**

1. ✗ $x=c_1e^{-y}+c_2e^{-3y}$ , $c_1,c_2-$arbitrary constants

2. ✓ $y=c_1e^{-x}+c_2e^{-3x}$ , $c_1,c_2-$arbitrary constants

3. ✗ $y=c_1e^{x}+c_2e^{3x}$ , $c_1,c_2-$arbitrary constants

4. ✗ $x=c_1e^{y}+c_2e^{3y}$ , $c_1,c_2-$arbitrary constants

**Question Number : 49 Question Id : 7225445450 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The particular integral of $(D^2+4)y=\cos 2x$ *is*

**Options :**

1. ✗ $-\frac{1}{2}x\sin 2x$



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2. ✖ $\frac{1}{2}x\sin 2x$

3. ✖ $-\frac{1}{4}x\cos 2x$

4. ✔ $\frac{1}{4}x\sin 2x$

**Question Number : 50 Question Id : 7225445451 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The integrating factor of the equation $x^2y\,dx-(x^3+y^3)dy=0$ *is*

**Options :**

1. ✖ $-\frac{1}{x^4}$

2. ✖ $\frac{1}{x^4}$

3. ✖ $\frac{1}{y^4}$



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4. ✔ $-\frac{1}{y^4}$

# Physics

| | |
|---|---|
| **Section Id :** | 722544109 |
| **Section Number :** | 2 |
| **Mandatory or Optional :** | Mandatory |
| **Number of Questions :** | 25 |
| **Section Marks :** | 25 |
| **Enable Mark as Answered Mark for Review and Clear Response :** | Yes |
| **Maximum Instruction Time :** | 0 |

**Question Number : 51 Question Id : 7225445452 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Parsec is the unit of

**Options :**

1. ✖ Time

2. ✔ Distance

3. ✖ Frequency

4. ✖ Angular acceleration



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**Question Number : 52 Question Id : 7225445453 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Among the following pairs, which pair does not have identical dimensions

**Options :**

1. ✔ Moment of inertia and moment of a force

2. ✘ Work and torque

3. ✘ Angular momentum and Planck's constant

4. ✘ Impulse and momentum

**Question Number : 53 Question Id : 7225445454 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

One of the two forces is double the other and their resultant is equal to the greater force.

The angle between them is

**Options :**

1. ✘ $\cos^{-1}(1/2)$

2. ✘ $\cos^{-1}(-1/2)$

3. ✘ $\cos^{-1}(1/4)$



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4. ✔ $\cos^{-1}(-1/4)$

**Question Number : 54 Question Id : 7225445455 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

If three vectors $\vec{A} = \hat{\imath} - 2\hat{\jmath} + 3\hat{k}$, $\vec{B} = x\hat{\imath} + 3\hat{k}$ and $\vec{C} = 7\hat{\imath} + 3\hat{\jmath} - 11\hat{k}$ are coplanar, then the value of $x$ is

**Options :**

1. ✘ 36/21

2. ✔ -51/13

3. ✘ 51/32

4. ✘ -36/21

**Question Number : 55 Question Id : 7225445456 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A body is allowed to fall from a height of 100 m. The time taken for the first 50 m is $t_1$ and for the remaining 50 m is $t_2$, then

**Options :**

1. ✘ $t_1 = t_2$



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2. ✓ $t_1 > t_2$

3. ✗ $t_1 < t_2$

4. ✗ Depends upon the mass

**Question Number : 56 Question Id : 7225445457 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Two stones are projected with the same speed but making different angles with the horizontal. Their horizontal ranges are equal. The angle of projection of one stone is $\pi/3$ and the maximum height reached by it is 102 meters. Then the maximum height reached by the other in meters is

**Options :**

1. ✗ 336

2. ✗ 224

3. ✗ 56

4. ✓ 34



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**Question Number : 57 Question Id : 7225445458 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A cricket ball is thrown at a speed of 28 $ms^{-1}$ in a direction $30^{\circ}$ above the horizontal. The time taken by the ball to return to the same level in seconds is

**Options :**

1. ✓ 2.9

2. ✗ 3.9

3. ✗ 1.9

4. ✗ 2

**Question Number : 58 Question Id : 7225445459 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The maximum height of a projectile is half of its range on the horizontal. If the velocity of the projection is u, then its range on the horizontal is

**Options :**

1. ✗ $\frac{2u^2}{5g}$

2. ✗ $\frac{3u^2}{5g}$



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3. ✗ $\frac{u^2}{g}$

4. ✓ $\frac{4u^2}{5g}$

**Question Number : 59 Question Id : 7225445460 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A cubical block rests on an inclined plane of coefficient of friction $\mu = \frac{1}{\sqrt{3}}$. What should be the angle of inclination so that the block just slides down the inclined plane?

**Options :**

1. ✓ $30°$

2. ✗ $60°$

3. ✗ $45°$

4. ✗ $90°$

**Question Number : 60 Question Id : 7225445461 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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For the equilibrium of a body on an inclined plane of inclination 45°, the coefficient of static friction will be

**Options :**

1. ✓ Greater than one

2. ✗ Zero

3. ✗ Less than one

4. ✗ Less than zero

**Question Number : 61 Question Id : 7225445462 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The displacement x and time t for a particle are related to each other as $t = \sqrt{x} + 3$. The work done in first six seconds of its motion is

**Options :**

1. ✗ 6 J

2. ✓ Zero

3. ✗ 4 J



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4. ✖ 2 J

**Question Number : 62 Question Id : 7225445463 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A particle move with a velocity $v = (5\hat{\imath} - 3\hat{\jmath} + 6\hat{k})$ m/s under the influence of a constant force $\vec{F} = 10\hat{\imath} + 10\hat{\jmath} + 20\hat{k}$. The instantaneous power applied to the particle is

**Options :**

1. ✖ 200 J/sec

2. ✖ 40 J/sec

3. ✔ 140 J/sec

4. ✖ 170 J/sec

**Question Number : 63 Question Id : 7225445464 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The main source of solar energy is

**Options :**

1. ✖ Nuclear fission



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2. ✓ Nuclear fusion

3. ✗ Gravitational contraction

4. ✗ Combustion

**Question Number : 64 Question Id : 7225445465 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The particle executing the simple harmonic motion passes through the mean position. It has

**Options :**

1. ✗ Minimum kinetic energy and maximum potential energy

2. ✓ Maximum kinetic energy and minimum potential energy

3. ✗ Maximum kinetic energy and maximum potential energy

4. ✗ Minimum kinetic energy and minimum potential energy

**Question Number : 65 Question Id : 7225445466 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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A simple pendulum has a time period $T_1$ on the earth's surface and $T_2$ at a height of R above the earth's surface, where R is the radius of the earth. The value of $T_2/T_1$ is

**Options :**

1. ✖ 1

2. ✖ 4

3. ✖ $\sqrt{2}$

4. ✔ 2

**Question Number : 66 Question Id : 7225445467 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is not a characteristic of musical sound?

**Options :**

1. ✖ Quality

2. ✖ Pitch

3. ✔ Wavelength

4. ✖ Loudness



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**Question Number : 67 Question Id : 7225445468 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Doppler shift in frequency does not depend upon

**Options :**

1. ✖ The actual frequency of the wave

2. ✔ The distance of the source from the listener

3. ✖ The velocity of the source

4. ✖ The velocity of the observer

**Question Number : 68 Question Id : 7225445469 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Inaudibility limit is around

**Options :**

1. ✖ One-hundredth of the initial intensity

2. ✖ One-tenth of the initial intensity



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3. ✖ One-thousandth of the initial intensity

4. ✔ One-millionth of the initial intensity

**Question Number : 69 Question Id : 7225445470 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

An ideal gas at 27°C is compressed adiabatically to 8/27 of its original volume. If $\gamma = 5/3$, then the rise in temperature is

**Options :**

1. ✖ 450K

2. ✔ 375K

3. ✖ 225K

4. ✖ 405K

**Question Number : 70 Question Id : 7225445471 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A system is provided with 200 calories of heat and the work done by the system on the surrounding is 40 J. Then its internal energy

**Options :**



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1. ✗ Increases by 600 J

2. ✗ Decreases by 800 J

3. ✓ Increases by 800 J

4. ✗ Decreases by 50J

**Question Number : 71 Question Id : 7225445472 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The temperature of $n$ moles of an ideal gas is increased from T to 4Tthrough a process for which pressure $P = a T^{-1}$where a is a constant. Then the work done by the gas is

**Options :**

1. ✗ $nRT$

2. ✗ $4nRT$

3. ✗ $2nRT$

4. ✓ $6nRT$

**Question Number : 72 Question Id : 7225445473 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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When an ideal gas with pressure P and volume V is compressed isothermally to one fourth of its volume, the pressure is $P_1$. When the same gas is compressed polytropically according to the equation $PV^{1.5}$ = constant to one fourth of its initial volume, the pressure is $P_2$. The ratio of $P_2/P_1$ is

**Options :**

1. ✖ $\frac{1}{2}$

2. ✖ $\frac{1}{2^{1.5}}$

3. ✔ 2

4. ✖ $2^{1.5}$

**Question Number : 73 Question Id : 7225445474 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A Carnot engine whose efficiency is 40%, receives heat at 500K. If the efficiency is to be 50%, the source temperature for the same exhaust temperature is

**Options :**

1. ✖ 900 K



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2. ✓ 600 K

3. ✗ 700 K

4. ✗ 800 K

**Question Number : 74 Question Id : 7225445475 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Optical fibers carry very large information compared to copper cables because of their

**Options :**

1. ✗ Large thickness

2. ✓ Extremely wide bandwidth

3. ✗ Extremely less bandwidth

4. ✗ Light weight

**Question Number : 75 Question Id : 7225445476 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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A superconductor is a perfect …….. material.

**Options :**

1. ✔ Diamagnetic

2. ✘ Dielectric

3. ✘ Insulating

4. ✘ Semiconducting

## Chemistry

| | |
|---|---|
| **Section Id :** | 722544110 |
| **Section Number :** | 3 |
| **Mandatory or Optional :** | Mandatory |
| **Number of Questions :** | 25 |
| **Section Marks :** | 25 |
| **Enable Mark as Answered Mark for Review and Clear Response :** | Yes |
| **Maximum Instruction Time :** | 0 |

**Question Number : 76 Question Id : 7225445477 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is not a characteristic of Plank's theory radiation?

**Options :**



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1. ✗ Energy is always associated with radiations

2. ✓ The absorption and emission of energy occur continuously and not in small packets of energy called quanta

3. ✗ The energy associated with a quantum of radiation is directly proportional to its frequency

4. ✗ The emission and absorption of energy takes place in small packets called quanta

**Question Number : 77 Question Id : 7225445478 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The atomic number of calcium is 20 and mass number is 40, it contains

**Options :**

1. ✓ 20 protons, 20 electrons and 20 neutrons

2. ✗ 20 protons, 20 electrons and 22 neutrons

3. ✗ 20 protons, 20 electrons and 40 neutrons

4. ✗ 40 protons, 20 electrons and 20 neutrons



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**Question Number : 78 Question Id : 7225445479 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which molecule among the following obeys the octet rule?

**Options :**

1. ✗ $PF_5$

2. ✗ NO

3. ✗ $ClO_2$

4. ✓ $O_2$

**Question Number : 79 Question Id : 7225445480 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one among the following has higher ionic radius?

**Options :**

1. ✓ $C^{4-}$

2. ✗ $N^{3-}$

3. ✗ $O^{2-}$



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4. ✖ $Na^+$

**Question Number : 80 Question Id : 7225445481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

0.2 equivalents of $H_2SO_4$ is present in 100 mL of the solution. What is its normality?

**Options :**

1. ✖ 1 N

2. ✔ 2 N

3. ✖ 4 N

4. ✖ 20 N

**Question Number : 81 Question Id : 7225445482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which ion is isoelectronic with CO?

**Options :**

1. ✔ $CN^-$

2. ✖ $O_2^+$



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3. ✖ $O_2^-$

4. ✖ $N_2^+$

**Question Number : 82 Question Id : 7225445483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

20 mL of 0.01 M HCl solution is diluted to 100 mL What is the molarity of final solution?

**Options :**

1. ✖ 0.02 M

2. ✔ 0.002 M

3. ✖ 0.05 M

4. ✖ 0.001 M

**Question Number : 83 Question Id : 7225445484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

How many moles of HCl are required to react with completely with 2 moles of $Na_2CO_3$?

**Options :**



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1. ✗ 1

2. ✗ 2

3. ✗ 3

4. ✓ 4

**Question Number : 84 Question Id : 7225445485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one among the following is a Lewis acid and also Bronsted acid?

**Options :**

1. ✗ $CO_2$

2. ✗ $AlCl_3$

3. ✓ $H^+$

4. ✗ $Cu^{2+}$

**Question Number : 85 Question Id : 7225445486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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What is the pH of 0.01 M NaOH solution?

**Options :**

1. ✖ 2

2. ✖ 8

3. ✖ 10

4. ✔ 12

**Question Number : 86 Question Id : 7225445487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Four alkali metals A, B, C and D are having standard electrode potentials as -3.05, - 1.66, -0.40 and 0.80 V respectively. Which one will be most reducing?

**Options :**

1. ✔ A

2. ✖ B

3. ✖ C

4. ✖ D



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**Question Number : 87 Question Id : 7225445488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one among the following is used as depolarizer in dry cell battery?

**Options :**

1. ✖ Ammonium chloride

2. ✖ Potassium hydroxide

3. ✔ Manganese dioxide

4. ✖ Sodium phosphate

**Question Number : 88 Question Id : 7225445489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

How much copper is deposited when 2 Faraday of electricity is passed through a $CuSO_4$ solution? (Cu atomic weight = 63.54)

**Options :**

1. ✖ 31. 77 g

2. ✖ 159.54 g



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127.77 g

3. ✖

63.54 g

4. ✔

**Question Number : 89 Question Id : 7225445490 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What is the cell potential for the following cell at 298 K?
$Mg(s) \mid Mg^{2+}(0.001M) \parallel Cu^{2+}(0.0001M) \mid Cu(s)$
Given $E_0$ of $Cu^{2+}|Cu = 0.34$ V and $E_0$ of $Mg^{2+} \mid Mg = -2.37$ V

**Options :**

1. ✖ 1.34 V

2. ✔ 2.68 V

3. ✖ 0.268 V

4. ✖ 0.134 V

**Question Number : 90 Question Id : 7225445491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The hard water sample contains the following ions/salts. Which water sample is more in hardness?



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**Options :**

1. ✗ 100 grams of $CaCO_3$ per litre

2. ✗ 50 equivalents of $Ca^{2+}$ ions per litre

3. ✓ 20 moles of $CaCO_3$ per litre

4. ✗ 20 moles of $MgCO_3$ per litre

**Question Number : 91 Question Id : 7225445492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

20 ml of hard water required 10 ml of EDTA solution. The hardness of water sample is 1000 ppm. What is the molarity of EDTA?

**Options :**

1. ✓ 0.02 M

2. ✗ 0.03 M

3. ✗ 0.005 M

4. ✗ 0.05 M



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**Question Number : 92 Question Id : 7225445493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The hardness of water sample is 500 ppm. What is the weight of $MgSO_4$ present in it, assume that the hardness is only due to the presence of magnesium sulphate.

**Options :**

1. ✗ 0.3 g

2. ✗ 1.2 g

3. ✓ 0.6 g

4. ✗ 0.01 g

**Question Number : 93 Question Id : 7225445494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The rate of corrosion is high if

**Options :**

1. ✓ Anodic areas are small and cathodic areas are large

2. ✗ Anodic areas are large and cathodic areas are small

3. ✗ Both anodic and cathodic areas are large



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4. ✖ Does not depend upon the area of anode and cathode

**Question Number : 94 Question Id : 7225445495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

In electroplating, the metal to be coated or electroplated is made of

**Options :**

1. ✖ Anode

2. ✔ Cathode

3. ✖ Both anode and cathode

4. ✖ Inert metal

**Question Number : 95 Question Id : 7225445496 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is not a thermosetting plastic?

**Options :**

1. ✖ Bakelite

2. ✖ Melamine



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3. ✖ Epoxy resins

4. ✔ Teflon

**Question Number : 96 Question Id : 7225445497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one of the following molecule contains the functionality TWO?

**Options :**

1. ✖ 1, 2-Dihydroxy benzene

2. ✖ Benzene

3. ✖ Phenol

4. ✔ Ethylene

**Question Number : 97 Question Id : 7225445498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is not a synthetic rubber?

**Options :**

1. ✖ Buna-S



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2. ✗ Buna-N

3. ✗ Neoprene

4. ✓ 1, 4-Polyisoprene

**Question Number : 98 Question Id : 7225445499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is not a renewable source of energy?

**Options :**

1. ✗ Solar energy

2. ✗ Wind Energy

3. ✓ Petrol

4. ✗ Hydro energy

**Question Number : 99 Question Id : 7225445500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one among the following is not a greenhouse gas?

**Options :**



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1. ✖ $CH_4$

2. ✖ Water vapour

3. ✖ Chlorofluoro carbons

4. ✔ $SO_2$

**Question Number : 100 Question Id : 7225445501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which one is responsible for the depletion of ozone layer?

**Options :**

1. ✖ Carbon free radical

2. ✖ Oxygen free radical

3. ✔ Chlorine free radical

4. ✖ Fluorine free radical



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# Electronics and Instrumentation Engineering

| | |
|---|---|
| **Section Id :** | 722544111 |
| **Section Number :** | 4 |
| **Mandatory or Optional :** | Mandatory |
| **Number of Questions :** | 100 |
| **Section Marks :** | 100 |
| **Enable Mark as Answered Mark for Review and Clear Response :** | Yes |
| **Maximum Instruction Time :** | 0 |

**Question Number : 101 Question Id : 7225445502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured?

**Options :**

1. ✘ Absolute instruments

2. ✔ Indicating instruments

3. ✘ Recording instruments

4. ✘ Integrating instruments

**Question Number : 102 Question Id : 7225445503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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Most common form of A.C. meters met with in every day domestic and industrial installations are

**Options :**

1. ✗ mercury motor meters

2. ✗ commutator motor meters

3. ✓ induction type single phase energy meters

4. ✗ watthour meters

**Question Number : 103 Question Id : 7225445504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

In majority of instruments damping is provided by

**Options :**

1. ✗ fluid friction

2. ✗ spring

3. ✓ eddy currents



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4. ✗ mass

**Question Number : 104 Question Id : 7225445505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

For measurements on high voltage capacitors, the suitable bridge is

**Options :**

1. ✗ Wein bridge

2. ✓ Schering bridge

3. ✗ Modified De Santy's bridge

4. ✗ Wheatstone bridge

**Question Number : 105 Question Id : 7225445506 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Digital voltmeters convert _____

**Options :**

1. ✓ analog to digital signal



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digital to analog signal

2. ✖

current to voltage

3. ✖

resistance to voltage

4. ✖

**Question Number : 106 Question Id : 7225445507 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What determines light intensity in a CRT?

**Options :**

voltage

1. ✖

current

2. ✖

fluorescent screen

3. ✖

4. ✔ momentum of electrons

**Question Number : 107 Question Id : 7225445508 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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Q meter works on the principle of _____

**Options :**

1. ✗ barkhausen criterion

2. ✗ piezoelectric effect

3. ✗ parallel resonance

4. ✓ series resonance

**Question Number : 108 Question Id : 7225445509 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following signals are generated by Wien-bridge oscillators?

**Options :**

1. ✗ Square wave

2. ✓ Sine wave

3. ✗ Triangular wave



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Pulse wave

4. ✖

**Question Number : 109 Question Id : 7225445510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following element is not used in an automatic control system?

**Options :**

Final control element

1. ✖

Sensor

2. ✖

Oscillator

3. ✔

Error detector

4. ✖

**Question Number : 110 Question Id : 7225445511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

In a control system the output of the controller is given to

**Options :**

Amplifier

1. ✖



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2. ✗ Sensor

3. ✗ Comparator

4. ✓ Final control element

**Question Number : 111 Question Id : 7225445512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Feedback control system is basically _____

**Options :**

1. ✗ Band pass filter

2. ✗ Band stop filter

3. ✗ High pass filter

4. ✓ Low pass filter

**Question Number : 112 Question Id : 7225445513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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What is the relation between output response and input signal in closed loop system?

**Options :**

1. ✖ Nonlinear

2. ✔ Linear

3. ✖ Exponential

4. ✖ Parabolic

**Question Number : 113 Question Id : 7225445514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

An SCR is a

**Options :**

1. ✖ four-layer, four junction device

2. ✔ four-layer, three junction device

3. ✖ four-layer, two junction device



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three-layer. single junction device

4. ✗

**Question Number : 114 Question Id : 7225445515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What should be the biasing of the LED?

**Options :**

Forward bias

1. ✓

Reverse bias

2. ✗

Both biases are applied

3. ✗

No biasing required

4. ✗

**Question Number : 115 Question Id : 7225445516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Ultrasonic waves carry more

**Options :**

energy only

1. ✗



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2. ✗ frequency only

3. ✗ heat

4. ✓ energy and frequency

**Question Number : 116 Question Id : 7225445517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The insulating material used in dielectric heating is

**Options :**

1. ✗ Coal

2. ✗ Silver

3. ✗ Coin

4. ✓ Wool

**Question Number : 117 Question Id : 7225445518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Choose the incorrect statement.

**Options :**



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1. ✗ SMPS is less sensitive to input voltage variations

2. ✗ SMPS is smaller as compared to rectifiers

3. ✓ SMPS has low input ripple

4. ✗ SMPS is a source of radio interference

**Question Number : 118 Question Id : 7225445519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The basic laws for analyzing an electric circuit are :-

**Options :**

1. ✗ Einstein's theory

2. ✗ Newtons laws

3. ✓ Kirchhoff's laws

4. ✗ Faradays laws



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**Question Number : 119 Question Id : 7225445520 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What happens to the voltage across the capacitor when the Q factor increases?

**Options :**

1. ✔ Increases

2. ✖ Decreases

3. ✖ Remains the same

4. ✖ Becomes zero

**Question Number : 120 Question Id : 7225445521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Norton's theorem is true for _____

**Options :**

1. ✖ Non-Linear networks

2. ✔ Linear networks

3. ✖ Both linear networks and nonlinear networks



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4. ✖ Neither linear networks nor non-linear networks

**Question Number : 121 Question Id : 7225445522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which is the additional part used in automatic iron compared to non-automatic iron?

**Options :**

1. ✖ Heal Plate

2. ✖ Pressure Plate

3. ✖ Chord Wire.

4. ✔ Thermostat.

**Question Number : 122 Question Id : 7225445523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Current transformers are used for _____

**Options :**

1. ✖ to provide to measure voltages



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2. ✔ to measure high value of currents

3. ✖ to short-circuit the unwanted instruments

4. ✖ to measure low value of currents.

**Question Number : 123 Question Id : 7225445524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following part is used in construction of DC machine but not in AC machine?

**Options :**

1. ✖ Armature Winding

2. ✖ Field winding

3. ✔ Commutator

4. ✖ Shaft

**Question Number : 124 Question Id : 7225445525 Display Question Number : Yes Is Question Mandatory : No Calculator : None**



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**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The barrier potential for silicon diode in forward bias condition is

**Options :**

1. ✖ 0.5 V

2. ✔ 0.7 V

3. ✖ 0.2 V

4. ✖ 1.2 V

**Question Number : 125 Question Id : 7225445526 Display Question Number : Yes Is Question Mandatory : No Calculator : None**
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The conductivity of the intrinsic semiconductor at absolute temperature is

**Options :**

1. ✔ Zero

2. ✖ 0.5 eV

3. ✖ 1.1 eV



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Infinity

4. ✗

**Question Number : 126 Question Id : 7225445527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The voltage across Zener diode is constant in

**Options :**

Forward direction

1. ✗

Reverse direction

2. ✓

Both in Forward direction & Reverse direction

3. ✗

On state

4. ✗

**Question Number : 127 Question Id : 7225445528 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Ripple factor of half wave rectifier is given by

**Options :**

0.482

1. ✗



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2. ✗ 0.21

3. ✓ 1.21

4. ✗ 0.5

**Question Number : 128 Question Id : 7225445529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

CE- transistor configuration produces output phase shift of

**Options :**

1. ✗ 0°

2. ✗ 90°

3. ✗ 120°

4. ✓ 180°

**Question Number : 129 Question Id : 7225445530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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For NPN transistor in active mode of operation the base-emitter junction and collector-base junctions are connected ____ respectively.

**Options :**

1. ✔ Forward bias & Reverse bias.

2. ✖ Reverse bias & Forward bias.

3. ✖ Reverse bias & Reverse bias

4. ✖ Forward bias & Forward bias.

**Question Number : 130 Question Id : 7225445531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The base current amplification factor β is given by

**Options :**

1. ✖ $\beta = I_C/I_E$

2. ✖ $\beta = I_B/I_C$

3. ✖ $\beta = I_B/I_E$



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$\beta = I_C/I_B$

4. ✔

**Question Number : 131 Question Id : 7225445532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Calculate $I_E$ in a transistor for which $\beta = 50$ and $I_B = 20\ \mu A$.

**Options :**

1. ✔ 1.02 mA

2. ✖ 1.02 A

3. ✖ 1.20 mA

4. ✖ 1.20 A

**Question Number : 132 Question Id : 7225445533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The common collector amplifier is also known as

**Options :**

1. ✔ Emitter follower

2. ✖ Base follower



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3. ✖ Collector follower

4. ✖ Gate follower

**Question Number : 133 Question Id : 7225445534 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

For a JFET, when VDS is increased beyond the pinch off voltage, the drain current

**Options :**

1. ✖ Increases

2. ✖ Decreases

3. ✖ First decreases and then increases.

4. ✔ remains constant.

**Question Number : 134 Question Id : 7225445535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A BJT is _____ controlled and the FET is _____ controlled device.

**Options :**



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1. ✗ Current, Current

2. ✗ Voltage, Voltage

3. ✓ Current, Voltage

4. ✗ Voltage, Current

**Question Number : 135 Question Id : 7225445536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What is the equivalent peak-to peak voltage ($V_{pp}$) of a 3 $V_{rms}$ sine wave?

**Options :**

1. ✗ 4.242

2. ✗ 1.06

3. ✗ 2.828

4. ✓ 8.484



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**Question Number : 136 Question Id : 7225445537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Convert $(17)_8$ octal number to decimal

**Options :**

1. ✗ 19

2. ✗ 51

3. ✓ 15

4. ✗ 21

**Question Number : 137 Question Id : 7225445538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is called as Universal Gate

**Options :**

1. ✗ And gate

2. ✗ Or Gate

3. ✗ Ex-or Gate



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4. ✔ Nor Gate

**Question Number : 138 Question Id : 7225445539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The fastest switching logic family is

**Options :**

1. ✔ ECL.

2. ✘ TTL.

3. ✘ DTL.

4. ✘ CMOS.

**Question Number : 139 Question Id : 7225445540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which is volatile memory

**Options :**

1. ✘ ROM.

2. ✔ RAM.



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3. ✗ EPROM.

4. ✗ EEPROM.

**Question Number : 140 Question Id : 7225445541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A one-to-sixteen (1 X16) de-multiplexer requires

**Options :**

1. ✗ 2 select input lines.

2. ✗ 3 select input lines.

3. ✓ 4 select input lines.

4. ✗ 5 select input lines.

**Question Number : 141 Question Id : 7225445542 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which digital circuit can be used to add more than one bit simultaneously

**Options :**



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1. ✖ Half adder

2. ✖ Full adder

3. ✖ Decoder

4. ✔ Ripple carry adder.

**Question Number : 142 Question Id : 7225445543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

How a JK-Flip flop made to toggle

**Options :**

1. ✖ J= 0 & K=0

2. ✔ J= 1 & K=1

3. ✖ J= 0 & K=1

4. ✖ J= 1 & K=0



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**Question Number : 143 Question Id : 7225445544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Latch is a device with

**Options :**

1. ✘ One stable state

2. ✔ Two stable states

3. ✘ Four stable states

4. ✘ No stable states

**Question Number : 144 Question Id : 7225445545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The output of D-Flip-flop when input D=0 and clock is low is

**Options :**

1. ✘ 1

2. ✘ 0

3. ✘ Toggle between 0 & 1



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4. ✓ No change

**Question Number : 145 Question Id : 7225445546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The number of flip-flops required to design a MOD-10 counter that counts from zero through decimal '9' is

**Options :**

1. ✗ 2

2. ✓ 4

3. ✗ 8

4. ✗ 10

**Question Number : 146 Question Id : 7225445547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The ratio that quantifies the device's ability to reject the common mode signals is called as

**Options :**



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1. ✓ Common mode rejection ratio

2. ✗ Common mode ratio of reference

3. ✗ Voltage gain

4. ✗ Current gain

**Question Number : 147 Question Id : 7225445548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following characteristics not exhibited by an ideal op-amp

**Options :**

1. ✗ Infinite open loop gain

2. ✗ Infinite input impedance

3. ✗ Infinite slew rate

4. ✓ Infinite output resistance.



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**Question Number : 148 Question Id : 7225445549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

An instrument amplifier has a high

**Options :**

1. ✓ CMRR

2. ✗ Output impedence

3. ✗ Power gain

4. ✗ Noise factor

**Question Number : 149 Question Id : 7225445550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Active load is used in the collector of the difference amplifier of an op-amp to

**Options :**

1. ✗ Provide symmetry.

2. ✓ Increase the differential gain

3. ✗ Handle large signals.



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4. ✗ Increase the output resistance

**Question Number : 150 Question Id : 7225445551 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The 'slew rate' of an operational amplifier indicates

**Options :**

1. ✗ How fast its output current can change

2. ✗ How fast its output impedance can change

3. ✗ How fast its output power can change

4. ✓ How fast its output voltage can change when a step input signal is given.

**Question Number : 151 Question Id : 7225445552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

An op-amp when used as voltage follower has a voltage gain of

**Options :**

1. ✗ Zero.

2. ✓ Unity



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3. ✖ less than unity.

4. ✖ Infinity.

**Question Number : 152 Question Id : 7225445553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which oscillator circuit converts sine wave signal into square wave signal

**Options :**

1. ✖ Multivibrator

2. ✖ Wein bridge oscillator

3. ✔ Schmitt trigger.

4. ✖ Colpitts oscillator.

**Question Number : 153 Question Id : 7225445554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The Op-amp can amplify

**Options :**

1. ✖ D.C. signals only



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2. ✖ A.C. signals only

3. ✔ Both D.C. and A.C. signals

4. ✖ Neither D.C. nor A.C. signals

**Question Number : 154 Question Id : 7225445555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Program counters (PC) stores

**Options :**

1. ✖ Address of the previous instruction executed

2. ✔ Address of the next instruction to be executed

3. ✖ Data of the previous instruction executed

4. ✖ Data of the next instruction to be executed

**Question Number : 155 Question Id : 7225445556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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Which instruction is used to reading data from code memory in 8051 microcontrollers

**Options :**

1. ✔ MOV C

2. ✖ MOV X

3. ✖ MOV

4. ✖ XCH

**Question Number : 156 Question Id : 7225445557 Display Question Number : Yes Is Question Mandatory : No Calculator : None**
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

How many timers/counter 8051 have

**Options :**

1. ✔ 2

2. ✖ 3

3. ✖ 4

4. ✖ 8



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**Question Number : 157 Question Id : 7225445558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which instruction move the contents of register to accumulator

**Options :**

1. ✗ PUSH

2. ✗ POP

3. ✓ MOV

4. ✗ XCHG

**Question Number : 158 Question Id : 7225445559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Number of pins in a 8-bit microcontroller

**Options :**

1. ✗ 24

2. ✗ 30

3. ✗ 32



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4. ✓ 40

**Question Number : 159 Question Id : 7225445560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

DMA stands for

**Options :**

1. ✗ Direct memory address

2. ✓ Direct memory access

3. ✗ Data memory address

4. ✗ Data memory access

**Question Number : 160 Question Id : 7225445561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

How many interrupt signals are there in 8051.

**Options :**

1. ✗ 2

2. ✗ 4



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3. ✓ 5

4. ✗ 8

**Question Number : 161 Question Id : 7225445562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which register is responsible for enabling and disabling the interrupt?

**Options :**

1. ✗ IP Register

2. ✓ IE Register

3. ✗ TCON Register

4. ✗ Timers

**Question Number : 162 Question Id : 7225445563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Positive displacement flowmeters are

**Options :**

1. ✗ Variable area flowmeters



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2. ✔ Quantity flow meters

3. ✖ Steady flow of gases

4. ✖ Variable head type flowmeters

**Question Number : 163 Question Id : 7225445564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Rotameter is a

**Options :**

1. ✖ Variable head type flowmeter

2. ✔ variable area type flowmeter

3. ✖ Positive displacement type flowmeter

4. ✖ mass flow meter

**Question Number : 164 Question Id : 7225445565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The term connected with the amount of water vapour present in air or gas.



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**Options :**

1. ✓ Moisture

2. ✗ humidity

3. ✗ viscosity

4. ✗ density

**Question Number : 165 Question Id : 7225445566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Optical sensors used for the displacement measurement works on the principal

**Options :**

1. ✗ Intensity of light increases with distance

2. ✓ Intensity of light decreases with distance

3. ✗ Intensity of  light remains constant with distance

4. ✗ Intensity of light increases with time

**Question Number : 166 Question Id : 7225445567 Display Question Number : Yes Is Question Mandatory : No Calculator : None**



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**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The ionization gauge an instrument used for the measurement of

**Options :**

1. ✔ Very low pressure

2. ✖ Medium pressure

3. ✖ High pressure

4. ✖ Very high pressure

**Question Number : 167 Question Id : 7225445568 Display Question Number : Yes Is Question Mandatory : No Calculator : None**
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The displacement measuring instruments is

**Options :**

1. ✖ Potentiometer only

2. ✖ LVDT only

3. ✖ RVDT only



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4. ✓ Potentiometer, LVDT and RVDT

**Question Number : 168 Question Id : 7225445569 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What is the output of a thermocouple

**Options :**

1. ✓ Voltage

2. ✗ Current

3. ✗ Resistance

4. ✗ Change in capacitance

**Question Number : 169 Question Id : 7225445570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Thermistor has a

**Options :**

1. ✗ Positive temperature coefficient of resistance



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2. ✓ Negative temperature coefficient of resistance

3. ✗ Zero Temperature Coefficient of Resistance

4. ✗ Temperature Coefficient of 10

**Question Number : 170 Question Id : 7225445571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Boiler drum level can be measured by

**Options :**

1. ✗ Venturi tube

2. ✗ Orifice meter

3. ✓ Ultrasonic level switch

4. ✗ Rotameter

**Question Number : 171 Question Id : 7225445572 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The device used to measure the moisture content in air



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**Options :**

1. ✗ PH Meter

2. ✓ Hygrometer

3. ✗ Hydrometer

4. ✗ Viscometer

**Question Number : 172 Question Id : 7225445573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Hot wire anemometer is used for the measurement of

**Options :**

1. ✓ Flow

2. ✗ Temperature

3. ✗ Pressure

4. ✗ Composition



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**Question Number : 173 Question Id : 7225445574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The draw back of the proportional control is

**Options :**

1. ✓ Offset

2. ✗ Lag

3. ✗ Lead

4. ✗ Oscillations

**Question Number : 174 Question Id : 7225445575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Highest settling time is observed in

**Options :**

1. ✓ Integral Control

2. ✗ Proportional control

3. ✗ Derivative control



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P+D control

4. ✖

**Question Number : 175 Question Id : 7225445576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Feed forward control can be used only

**Options :**

If the disturbance variable is measured

1. ✔

If the disturbance variable is manipulated

2. ✖

If the disturbance variable is ignored

3. ✖

If a regulatory control is needed

4. ✖

**Question Number : 176 Question Id : 7225445577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A pneumatic actuator converts

**Options :**

The pneumatic signal into electrical signal

1. ✖



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2. ✓ The pneumatic signal into position

3. ✗ The pneumatic signal into pressure

4. ✗ mechanical signal into electrical signal

**Question Number : 177 Question Id : 7225445578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

I/P Converter converts

**Options :**

1. ✓ (4-20)mA to (3-15)psi

2. ✗ (0 – 4) mA to (3 – 15) psi

3. ✗ (4-20)mV to (3-15)psi

4. ✗ (0 – 4) mV to (3 – 15) psi

**Question Number : 178 Question Id : 7225445579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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If Proportional band increases $K_p$

**Options :**

1. ✖ Increases

2. ✔ decreases

3. ✖ constant

4. ✖ PB and $K_p$ are not related

**Question Number : 179 Question Id : 7225445580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Cascade control is recommended only if

**Options :**

1. ✖ The overall process is fast to respond

2. ✖ The process is in the steady state

3. ✔ The overall process is slow to respond



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4. ✗ There is no relation between process variables

**Question Number : 180 Question Id : 7225445581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

For temperature process control the following controller is not recommended

**Options :**

1. ✗ Derivative control

2. ✗ P+D

3. ✓ P+I

4. ✗ P + I + D

**Question Number : 181 Question Id : 7225445582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

IAE, ITAE, ISE are the

**Options :**

1. ✓ Performance Indices

2. ✗ Types of errors



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3. ✗ Tuning parameters

4. ✗ process parameters

**Question Number : 182 Question Id : 7225445583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A transducer converts

**Options :**

1. ✗ Physical quantity to mechanical quantity

2. ✓ Physical quantity to electrical quantity

3. ✗ Electrical quantity to mechanical quantity

4. ✗ Electrical quantity to physical quantity

**Question Number : 183 Question Id : 7225445584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which of the following is a desirable characteristic of an instrument

**Options :**



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1. ✗ High drift

2. ✓ High fidelity

3. ✗ High measuring lag

4. ✗ Poor reproducibility

**Question Number : 184 Question Id : 7225445585 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

A Magnetic flow meter is

**Options :**

1. ✓ Based on the principle of Faradays law

2. ✗ Used for non conducting fluids

3. ✗ Based on the non linear relation between flow rate and EMF

4. ✗ used for measuring flow of gases



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**Question Number : 185 Question Id : 7225445586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Principle of radiation pyrometer is based on

**Options :**

1. ✗ Kirchoff's law

2. ✗ Seeback Effect

3. ✓ Stefan Boltzman law

4. ✗ Peltier effect

**Question Number : 186 Question Id : 7225445587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Load cells are used for the measurement of

**Options :**

1. ✓ Weight

2. ✗ Stress

3. ✗ Strain



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Pressure

4. ✖

**Question Number : 187 Question Id : 7225445588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

PH meter has

**Options :**

One cell

1. ✖

Two cells

2. ✔

Three cells

3. ✖

No cell

4. ✖

**Question Number : 188 Question Id : 7225445589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which is the most suitable instrument to calibrate the pressure gauges

**Options :**

Ionization guage

1. ✖



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Bourdon Guage

2. ✗

Mc Leod guage

3. ✗

Dead weight tester

4. ✓

**Question Number : 189 Question Id : 7225445590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which thermocouple can be used to measure $1500^0$C temperature

**Options :**

Copper constaton

1. ✗

Chromel alumel

2. ✗

Platinum platinum rhodium

3. ✓

Iron constanton

4. ✗

**Question Number : 190 Question Id : 7225445591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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ECG is the electrical activity of

**Options :**

1. ✔ heart

2. ✖ brain

3. ✖ muscle

4. ✖ eye

**Question Number : 191 Question Id : 7225445592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Phonocardiography is listening to

**Options :**

1. ✖ arm muscle sound

2. ✖ lungs sound

3. ✔ heart sound



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respiration sound

4. ✗

**Question Number : 192 Question Id : 7225445593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

EMG Instrument is used to monitor

**Options :**

cardiovascular function

1. ✗

neuro muscular function

2. ✓

nervous function

3. ✗

immune function

4. ✗

**Question Number : 193 Question Id : 7225445594 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Spirometer is an instrument used to measure

**Options :**

heart rate

1. ✗



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heart sounds

2. ✖

lung parameters

3. ✔

blood flow

4. ✖

**Question Number : 194 Question Id : 7225445595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

PPG is used to measure

**Options :**

pulse rate

1. ✔

ECG

2. ✖

lung volume

3. ✖

EEG

4. ✖

**Question Number : 195 Question Id : 7225445596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**



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Zirconia analyzer is used to measure

**Options :**

1. ✔ oxygen

2. ✖ nitrogen

3. ✖ CO

4. ✖ carbon dioxide

**Question Number : 196 Question Id : 7225445597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which device is used to isolate the radiation of the desired wavelength from wavelength of the continuous spectra ?

**Options :**

1. ✖ source

2. ✖ detector

3. ✔ monochromator



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entrance and exit slits

4. ✗

**Question Number : 197 Question Id : 7225445598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

What is the principle of IR spectroscopy

**Options :**

absorption

1. ✓

emission

2. ✗

adsorption

3. ✗

AAS

4. ✗

**Question Number : 198 Question Id : 7225445599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Which method is used to separation of thermally stable and volatile substance ?

**Options :**

NMR

1. ✗



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2. ✗ Mass spectroscopy

3. ✗ HPLC

4. ✓ Gas chromatography

**Question Number : 199 Question Id : 7225445600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

The detector used for X-Ray Spectroscopy

**Options :**

1. ✓ scintillation counter

2. ✗ FID

3. ✗ ECD

4. ✗ TCD

**Question Number : 200 Question Id : 7225445601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

In a PLC, the scan time refers to the amount of time in which

**Options :**



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1. ✖ the technician enters the program

2. ✖ timers and counters are indexed by processor

3. ✖ one "rung" of ladder logic takes to complete

4. ✔ the entire program takes to execute

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