

# Telangana State Council 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.

|   |  |
|---|--|
| <b>Question Paper Name:</b>                   | Electronics and Instrumentation Engineering 11th May 2019 Shift1 |
| <b>Subject Name:</b>                          | Electronics and Instrumentation Engineering                      |
| <b>Creation Date:</b>                         | 2019-05-11 13:35:19  |
| <b>Duration:</b>                              | 180  |
| <b>Total Marks:</b>                           | 200  |
| <b>Display Marks:</b>                         | No   |
| <b>Share Answer Key With Delivery Engine:</b> | Yes  |
| <b>Actual Answer Key:</b>                     | Yes  |
| <b>Calculator:</b>                            | None   |
| <b>Magnifying Glass Required?:</b>            | No   |
| <b>Ruler Required?:</b>                       | No   |
| <b>Eraser Required?:</b>                      | No   |
| <b>Scratch Pad Required?:</b>                 | No   |
| <b>Rough Sketch/Notepad Required?:</b>        | No   |
| <b>Protractor Required?:</b>                  | No   |
| <b>Show Watermark on Console?:</b>            | Yes  |
| <b>Highlighter:</b>                           | No   |
| <b>Auto Save on Console?:</b>                 | No   |

## Electronics and Instrumentation Engineering

|                                    |          |
|------------------------------------|----------|
| <b>Group Number :</b>              | 1        |
| <b>Group Id :</b>                  | 89465815 |
| <b>Group Maximum Duration :</b>    | 0        |
| <b>Group Minimum Duration :</b>    | 180      |
| <b>Revisit allowed for view? :</b> | No       |
| <b>Revisit allowed for edit? :</b> | No       |
| <b>Break time:</b>                 | 0        |
| <b>Group Marks:</b>                | 200      |

## Mathematics

|   |           |
|---|-----------|
| <b>Section Id :</b>                         | 89465856  |
| <b>Section Number :</b>                     | 1         |
| <b>Section type :</b>                       | Online    |
| <b>Mandatory or Optional:</b>               | Mandatory |
| <b>Number of Questions:</b>                 | 50        |
| <b>Number of Questions to be attempted:</b> | 50        |
| <b>Section Marks:</b>                       | 50        |
| <b>Display Number Panel:</b>                | Yes       |
| <b>Group All Questions:</b>                 | No        |

Sub-Section Number: 1  
Sub-Section Id: 89465861  
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 8946582805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Let  $M = (a_{ij})$  be a  $10 \times 10$  matrix such that  $a_{ij} = \begin{cases} 1, & \text{if } i+j=11 \\ 0, & \text{otherwise} \end{cases}$ . Then, the determinant of  $M$  is \_\_\_\_\_.

Options :

1. ✘ 0
2. ✘ 1
3. ✔ -1
4. ✘ 11

Question Number : 2 Question Id : 8946582806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Let  $A$  and  $B$  be two square matrices of order  $n$ . If  $AB = A$ ,  $BA = B$  then  $A^2 + B^2 = \underline{\hspace{2cm}}$ .

Options :

1. ✘  $AB$
2. ✘  $A - B$
3. ✘ 0
4. ✔  $A + B$

Question Number : 3 Question Id : 8946582807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Consider the system of linear equations  $x + y + z = 3$ ,  $x - y - z = 4$ ,  $x - 5y + \alpha z = 6$ . Then, the value of  $\alpha$  for which this system has an infinite number of solutions is \_\_\_\_\_.

Options :

1. ✓ -5

2. ✗ 5

3. ✗ 3

4. ✗ 1

Question Number : 4 Question Id : 8946582808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $A(\alpha, \beta) = \begin{pmatrix} \cos \alpha & \sin \alpha & 0 \\ -\sin \alpha & \cos \alpha & 0 \\ 0 & 0 & e^\beta \end{pmatrix}$ , then the inverse of the matrix  $A(\alpha, \beta)$  is \_\_\_\_\_.

Options :

1. ✗  $A(\alpha, \beta)$

2. ✗  $A(\alpha, -\beta)$

3. ✓  $A(-\alpha, -\beta)$

4. ✗  $A(-\alpha, \beta)$

Question Number : 5 Question Id : 8946582809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The rational fraction  $\frac{x^2 + 1}{(x^2 + 4)(x - 2)}$  is equal to \_\_\_\_\_

Options :

1. ✗  $\frac{3x + 6}{8(x^2 + 4)} + \frac{5}{4(x - 2)}$

2. ✗  $\frac{3x + 6}{4(x^2 + 4)} + \frac{5}{8(x - 2)}$

3. ✓  $\frac{3x+6}{8(x^2+4)} + \frac{5}{8(x-2)}$

4. ✗  $\frac{3x+6}{(x^2+4)} + \frac{5}{(x-2)}$

Question Number : 6 Question Id : 8946582810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\log_2 3 = a, \log_3 5 = b, \log_7 2 = c$ , then  $\log_{140} 63 =$  \_\_\_\_\_.

Options :

1. ✗  $\frac{1-2ac}{2c+abc+1}$

2. ✗  $\frac{1-2ac}{2c-abc-1}$

3. ✗  $\frac{1+2ac}{2c-abc-1}$

4. ✓  $\frac{1+2ac}{2c+abc+1}$

Question Number : 7 Question Id : 8946582811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\cos \frac{2\pi}{7} + \cos \frac{4\pi}{7} + \cos \frac{6\pi}{7} = \text{_____}.$$

Options :

1. ✗ 1

2. ✗  $\frac{1}{2}$

3. ✓  $\frac{-1}{2}$

4. ✘ 0

Question Number : 8 Question Id : 8946582812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the angles  $A, B$  and  $C$  of a triangle are in an arithmetic progression and if  $a, b$  and  $c$  denote the lengths of the sides opposite to  $A, B$  and  $C$  respectively, then the value of the

expression  $\frac{a}{c} \sin 2C + \frac{c}{a} \sin 2A$  is  $\underline{\hspace{1cm}}$ .

Options :

1. ✔  $\sqrt{3}$

2. ✘  $\frac{\sqrt{3}}{2}$

3. ✘ 1

4. ✘  $\frac{1}{2}$

Question Number : 9 Question Id : 8946582813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\sin x + \sin y = \frac{1}{4}$  and  $\cos x + \cos y = \frac{1}{3}$ , then  $\cot(x + y) = \underline{\hspace{2cm}}$ .

Options :

1. ✔  $\frac{7}{24}$

2. ✘  $\frac{24}{7}$

3. ✘  $\frac{3}{4}$

4. ✘ 1

Question Number : 10 Question Id : 8946582814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\sin(x^\circ + 28^\circ) = \cos(3x^\circ - 78^\circ)$  and  $0^\circ < x^\circ < 90^\circ$ , then, which of the following is the value of  $x^\circ$ ?

Options :

1. ✘  $50^\circ$

2. ✘  $30^\circ$

3. ✘  $16^\circ$

4. ✔  $8^\circ$

Question Number : 11 Question Id : 8946582815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $x = \tan\left(\operatorname{Cosec}^{-1}\frac{65}{63}\right)$  and  $y = \sec^2\left(\operatorname{Cot}^{-1}\frac{1}{2}\right) + \operatorname{cosec}^2\left(\operatorname{Tan}^{-1}\frac{1}{3}\right)$ , then  $(x, y) = \underline{\hspace{2cm}}$ .

Options :

1. ✔  $\left(\frac{63}{16}, 15\right)$

2. ✘  $\left(\frac{16}{63}, 15\right)$

3. ✘  $\left(\frac{63}{16}, 5\right)$

4. ✘  $\left(\frac{16}{63}, 5\right)$

Question Number : 12 Question Id : 8946582816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation  $\tan^{-1}\left(\frac{x+1}{x-1}\right) + \tan^{-1}\left(\frac{x-1}{x}\right) = \tan^{-1}(-7)$  has \_\_\_\_\_.

Options :

1. ✓ unique solution  $x = 2$
2. ✗ two solutions  $x = 1, 2$
3. ✗ no solution
4. ✗ infinite number of solutions

Question Number : 13 Question Id : 8946582817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a triangle  $ABC$ , let  $a, b$  and  $c$  denote the lengths of the sides opposite to

$A, B$  and  $C$  respectively. If  $\frac{1}{a+c} + \frac{1}{b+c} = \frac{3}{a+b+c}$ , then the angle  $C$  is \_\_\_\_\_.

Options :

1. ✗  $30^\circ$
2. ✗  $90^\circ$
3. ✓  $60^\circ$
4. ✗  $45^\circ$

Question Number : 14 Question Id : 8946582818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\sin hx = 3$  then  $x =$  \_\_\_\_\_.

Options :

1. ✓  $\log(3 + \sqrt{10})$
2. ✗  $\log(3 - \sqrt{10})$

3. ✘  $\log(6 + \sqrt{10})$

4. ✘ 1

Question Number : 15 Question Id : 8946582819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT true for the complex numbers  $z_1$  and  $z_2$  ?

Options :

1. ✘  $\frac{z_1}{z_2} = \frac{z_1 \bar{z}_2}{|z_2|^2}$

2. ✘  $|z_1 + z_2| \leq |z_1| + |z_2|$

3. ✔  $|z_1 + z_2| \leq ||z_1| - |z_2||$

4. ✘  $|z_1 + z_2|^2 + |z_1 - z_2|^2 = 2|z_1|^2 + 2|z_2|^2$

Question Number : 16 Question Id : 8946582820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a complex number  $z = \frac{\sqrt{3}}{2} + i\frac{1}{2}$ , then  $z^4$  is \_\_\_\_\_.

Options :

1. ✘  $2\sqrt{2} + 2i$

2. ✔  $\frac{-1}{2} + i\frac{\sqrt{3}}{2}$

3. ✘  $\frac{\sqrt{3}}{2} - i\frac{1}{2}$

4. ✘  $\frac{\sqrt{3}}{8} - i\frac{1}{8}$



Question Number : 17 Question Id : 8946582821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation of the straight line which makes intercepts  $r$  and  $s$  on the coordinate axes

such that  $r + s = 5$  and  $rs = 6$  is  $ax + by + c = 0$ , then  $a + b + c = \underline{\hspace{2cm}}$ .

Options :

1. ✘ 11

2. ✘ 5

3. ✘ -7

4. ✔ -1

Question Number : 18 Question Id : 8946582822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a straight line  $ax + by + \sqrt{5} = 0$  touches the circle  $x^2 + y^2 = 5$ , then which of the

following is TRUE?

Options :

1. ✘  $5(a^2 + b^2) = 1$

2. ✘  $a^2 + b^2 = \sqrt{5}$

3. ✔  $a^2 + b^2 = 1$

4. ✘  $\sqrt{a^2 + b^2} = 5$

Question Number : 19 Question Id : 8946582823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a chord of length 12 cm is at a distance of  $4\sqrt{10}$  cm from the centre of the circle, then

the radius of the circle is \_\_\_\_\_.

Options :

1. ✓ 14 cm

2. ✗  $\sqrt{304}$  cm

3. ✗ 4 cm

4. ✗  $\sqrt{124}$  cm

Question Number : 20 Question Id : 8946582824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The 2019<sup>th</sup> derivative of the function  $(x-1)e^{-x}$  is \_\_\_\_\_

Options :

1. ✗  $\frac{x-2019}{e^x}$

2. ✗  $\frac{2019-x}{e^x}$

3. ✗  $\frac{x-2020}{e^x}$

4. ✓  $\frac{2020-x}{e^x}$

Question Number : 21 Question Id : 8946582825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $z = f(x+ct) + \varphi(x-ct)$ , then  $\frac{\partial^2 z}{\partial t^2} =$  \_\_\_\_\_.

Options :

1. ✓  $c^2 \frac{\partial^2 z}{\partial x^2}$

2. ✘  $-c^2 \frac{\partial^2 z}{\partial x^2}$

3. ✘  $\frac{1}{c^2} \frac{\partial^2 z}{\partial x^2}$

4. ✘  $-\frac{1}{c^2} \frac{\partial^2 z}{\partial x^2}$

Question Number : 22 Question Id : 8946582826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If  $x = r \cos \theta$ ,  $y = r \sin \theta$  and  $U = \frac{f(\theta)}{r}$  then  $x \frac{\partial U}{\partial x} + y \frac{\partial U}{\partial y} =$  \_\_\_\_\_.

Options :

1. ✘ 0

2. ✘  $U$

3. ✔  $-U$

4. ✘  $2U$

Question Number : 23 Question Id : 8946582827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Let  $f(x+y) = f(x)f(y)$ ,  $\forall x, y$  and  $f'(0) = 5$ ,  $f(2019) = 15$ . Then the value of  $f'(2019)$  is \_\_\_\_\_.

Options :

1. ✘ 3

2. ✔ 75

3. ✘  $\frac{1}{3}$

4. ✘  $\frac{1}{75}$

Question Number : 24 Question Id : 8946582828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The set of values of  $x$  for which the function  $f(x) = 2x^3 - 9x^2 + 12x + 4$  is increasing is \_\_\_\_\_.

Options :

1. ✘  $1 < x < 2$

2. ✘ all  $x \in \mathbb{R}$

3. ✔  $\mathbb{R} - [1, 2]$

4. ✘  $x \geq 2$

Question Number : 25 Question Id : 8946582829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$\lim_{x \rightarrow \infty} x \left( \log \left( 1 + \frac{x}{2} \right) - \log \left( \frac{x}{2} \right) \right) = \text{_____}.$

Options :

1. ✘  $e^2$

2. ✘  $\infty$

3. ✘ 1

4. ✔ 2

Question Number : 26 Question Id : 8946582830 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $f(x, y, z) = x^3 + xz^2 + y^3 + xyz$ ,  $x = e^t$ ,  $y = \cos t$ ,  $z = t^3$  then  $\frac{df}{dt}$  at  $t = 0$  is \_\_\_\_\_.

Options :

1. ✘ 2

2. ✘ 4

3. ✘ e

4. ✔ 3

Question Number : 27 Question Id : 8946582831 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is the value of  $5050 \times \frac{\int_0^1 (1 - (1-x)^{50})^{100} x^{49} dx}{\int_0^1 (1-x^{50})^{101} x^{49} dx}$ ?

Options :

1. ✔ 5100

2. ✘ 1

3. ✘ 5050

4. ✘  $\frac{1}{2}$

Question Number : 28 Question Id : 8946582832 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$\int_0^1 \max \left\{ x, \frac{1}{2} - x \right\} dx = \underline{\hspace{2cm}}$ .

Options :

1. ✘ 0

2. ✘  $\frac{1}{2}$

3. ✔  $\frac{9}{16}$

4. ✘  $\frac{9}{8}$

Question Number : 29 Question Id : 8946582833 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\lim_{n \rightarrow \infty} \frac{1}{n^6} \sum_{k=1}^n k^5 = \underline{\hspace{2cm}}.$$

Options :

1. ✔  $\frac{1}{6}$

2. ✘  $\frac{1}{5}$

3. ✘ 1

4. ✘ 6

Question Number : 30 Question Id : 8946582834 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\int_{-1}^1 \frac{x^{15} (1-x^2)^{12}}{(1+x^2)^8} dx = \underline{\hspace{2cm}}.$$

Options :

1. ✘ 0

2. ✔  $\frac{22}{7} - \pi$

3. ✘  $\frac{2}{105}$

4. ✘  $\frac{71}{15} - \frac{3\pi}{4}$

Question Number : 31 Question Id : 8946582835 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The area of the region bounded by the curves  $y = 2 - x^2$  and  $y = -x$  is \_\_\_\_\_.

Options :

1. ✘ 1
2. ✘  $\frac{8}{19}$
3. ✘  $\frac{35}{4}$
4. ✔  $\frac{27}{6}$

Question Number : 32 Question Id : 8946582836 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The volume of the solid obtained by revolving the region bounded by the curves  $y = x^3$ ,  $y = 8$  and  $x = 0$  about the  $y$ -axis is \_\_\_\_\_

Options :

1. ✘  $\frac{96}{5}$
2. ✔  $\frac{96\pi}{5}$
3. ✘  $\frac{32\pi}{5}$
4. ✘  $\frac{32}{5}$

Question Number : 33 Question Id : 8946582837 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of  $\int_0^{\pi} \theta \sin^2 \theta \cos^4 \theta d\theta$  is \_\_\_\_\_.

Options :

1. ✔  $\frac{\pi^2}{32}$

2. ✘  $\frac{\pi}{32}$

3. ✘  $\frac{\pi^2}{16}$

4. ✘  $\frac{\pi}{16}$

Question Number : 34 Question Id : 8946582838 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The average value of the function  $f(x) = 4 - x^2$  over the interval  $[-1, 3]$  is \_\_\_\_\_.

Options :

1. ✘ 5

2. ✘  $\frac{20}{3}$

3. ✔  $\frac{5}{3}$

4. ✘ 1

Question Number : 35 Question Id : 8946582839 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The differential equation  $x \frac{dy}{dx} = y + x^2$ ,  $x > 0$  satisfying  $y(0) = 0$  has \_\_\_\_\_.

Options :

1. ✔ infinitely many solutions

2. ✘ no solution

3. ✘ a unique solution

4. ✘ exactly two solutions



Question Number : 36 Question Id : 8946582840 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The differential equation  $(axy^3 + y \cos x)dx + (x^2y^2 + b \sin x)dy = 0$  is an exact differential equation for \_\_\_\_\_.

Options :

1. ✘  $a = 1, b = \frac{3}{2}$

2. ✘  $a = \frac{3}{2}, b = 1$

3. ✔  $a = \frac{2}{3}, b = 1$

4. ✘  $a = 1, b = \frac{2}{3}$

Question Number : 37 Question Id : 8946582841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\sin x$  is a solution of the differential equation  $\frac{d^4y}{dx^4} + 2\frac{d^3y}{dx^3} + 6\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 5y = 0$ ,

then the general solution is \_\_\_\_\_.

Options :

1. ✔  $y = c_1 \sin x + c_2 \cos x + e^{-x}(c_3 \sin 2x + c_4 \cos 2x)$

2. ✘  $y = c_1 \sin x + c_2 \cos x + c_3 \sin 2x + c_4 \cos 2x$

3. ✘  $y = c_1 \sin x + c_2 \cos x + c_3 e^{-3x} + c_4 e^{-2x}$

4. ✘  $y = c_1 \sin x + c_2 \cos x + c_3 e^{3x} + c_4 e^{2x}$

Question Number : 38 Question Id : 8946582842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $D \equiv \frac{d}{dx}$ , then  $\frac{1}{D^2 - 4D + 13}(6e^{2x} \sin 3x)$  is \_\_\_\_\_.

Options :

1. ✓  $-xe^{2x} \cos 3x$

2. ✗  $xe^{2x} \cos 3x$

3. ✗  $-xe^{2x} \sin 3x$

4. ✗  $xe^{2x} \sin 3x$

Question Number : 39 Question Id : 8946582843 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The general solution of  $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right) \frac{dx}{dy} = 1$  is \_\_\_\_\_.

Options :

1. ✗  $y = e^{2\sqrt{x}} (2\sqrt{x} + c)$

2. ✗  $y = 2\sqrt{x} e^{2\sqrt{x}} + c$

3. ✗  $y = 2\sqrt{x} e^{-2\sqrt{x}} + c$

4. ✓  $y = e^{-2\sqrt{x}} (2\sqrt{x} + c)$

Question Number : 40 Question Id : 8946582844 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Let  $y$  be the solution of the differential equation  $\frac{dy}{dx} + y = x$ ,  $x \in \mathbb{R}$  and  $y(-1) = 0$ .

Then,  $y(1)$  is equal to \_\_\_\_\_.

Options :

1. ✘  $\frac{2}{e} - \frac{2}{e^2}$

2. ✔  $2e^{-2}$

3. ✘  $2 - \frac{2}{e}$

4. ✘  $2 - 2e$

Question Number : 41 Question Id : 8946582845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the substitution  $x = X + h$ ,  $y = Y + k$  transforms the differential equation  $(y - x + 1)dy - (y + x + 2)dx = 0$  into a homogeneous equation, then the value of  $(h, k)$  is \_\_\_\_\_.

Options :

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

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

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

4. ✘  $\left(\frac{-3}{2}, \frac{-1}{2}\right)$

Question Number : 42 Question Id : 8946582846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The general solution of  $\frac{dy}{dx} - y = y^2(\sin x + \cos x)$  is \_\_\_\_\_.

Options :

1. ✘  $y = \frac{1}{ce^x - \sin x}$

2. ✘  $y = ce^{-x} - e^x \sin x$

3. ✘  $y = ce^{-x} - \sin x$

4. ✔  $y = \frac{1}{ce^{-x} - \sin x}$

Question Number : 43 Question Id : 8946582847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the function  $f(t) = \begin{cases} \sin t, & \text{for } 0 \leq t \leq \pi \\ 0, & \text{for } t > \pi \end{cases}$

is \_\_\_\_\_.

Options :

1. ✘  $\frac{1}{(1+s^2)}$  for all  $s > 0$

2. ✘  $\frac{1}{(1+s^2)}$  for all  $s < \pi$

3. ✔  $\frac{(1+e^{-\pi s})}{(1+s^2)}$  for all  $s > 0$

4. ✘  $\frac{e^{-\pi s}}{(1+s^2)}$  for all  $s > 0$

Question Number : 44 Question Id : 8946582848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The inverse Laplace transform of  $\frac{5}{s} - \frac{3e^{-3s}}{s} - \frac{2e^{-7s}}{s}$  is \_\_\_\_\_.

Options :

1. ✘  $f(x) = \begin{cases} 5, & 0 < x < 3 \\ 0, & 3 < x < 7 \\ 2, & x > 7 \end{cases}$

2. ✘  $f(x) = \begin{cases} 5, & 0 < x < 7 \\ 2, & x > 7 \end{cases}$

3. ✔  $f(x) = \begin{cases} 5, & 0 < x < 3 \\ 2, & 3 < x < 7 \\ 0, & x > 7 \end{cases}$

4. ✘  $f(x) = \begin{cases} 5, & 0 < x < 7 \\ 0, & x > 7 \end{cases}$

Question Number : 45 Question Id : 8946582849 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical  
 Correct Marks : 1 Wrong Marks : 0

The Laplace transform of a function  $f(x)$  is  $F(s) = \frac{1}{s^3 + 2s^2 + 2s}$  Then,  $\lim_{x \rightarrow 0} f(x) =$

\_\_\_\_\_.

Options :

1. ✔ 0

2. ✘ 3

3. ✘  $\infty$

4. ✘  $\frac{1}{2}$

Question Number : 46 Question Id : 8946582850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical  
 Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the solution of the differential equation  $\frac{dy}{dx} - 2y = e^{5x}$  with the

initial condition  $y(0) = 3$  is \_\_\_\_\_.

Options :

1. ✘  $\frac{1}{3(s-2)} + \frac{1}{3(s-5)}$

2. ✘  $\frac{8}{3(s-2)} + \frac{1}{s-5}$

3. ✔  $\frac{8}{3(s-2)} + \frac{1}{3(s-5)}$

4. ✘  $\frac{8}{s-2} + \frac{1}{3(s-5)}$

Question Number : 47 Question Id : 8946582851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $L(y(x)) = Y(s)$  and  $y(x) = x^3 + \int_0^x \sin(x-t)y(t)dt$  then  $\frac{1}{6}Y(s) =$  \_\_\_\_\_.

Options :

1. ✔  $\left(\frac{1}{s^4} + \frac{1}{s^6}\right)$

2. ✘  $\left(\frac{1}{s^3} + \frac{1}{s^5}\right)$

3. ✘  $\left(\frac{1}{s^3} + \frac{1}{s^7}\right)$

4. ✘  $\left(\frac{1}{s} + \frac{1}{s^3}\right)$

Question Number : 48 Question Id : 8946582852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For  $x > 0$ ,  $\int_0^{\infty} \frac{\sin xt}{t} dt$  is \_\_\_\_\_.

Options :

1. ✘ 0

2. ✘  $\frac{\pi}{2x}$

3. ✘  $\frac{1}{x}$

4. ✔  $\frac{\pi}{2}$

Question Number : 49 Question Id : 8946582853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $f(x) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)$  is the Fourier series of the function

$$f(x) = \begin{cases} 0, & -\pi \leq x < 0 \\ \pi, & 0 \leq x \leq \pi \end{cases} \text{ then, which of the following is TURE?}$$

Options :

1. ✘  $a_n = 0$ , for all  $n \geq 0$

2. ✘  $a_0 = \frac{\pi}{2}$  and  $a_n = 0$ , for all  $n \geq 1$

3. ✘  $b_n \neq 0$ , for all  $n \geq 1$

4. ✔  $a_0 = \pi$  and  $a_n = 0$ , for all  $n \geq 1$

Question Number : 50 Question Id : 8946582854 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A function  $f(x)$  is such that  $f(x + 2\pi) = f(x)$  and  $f(x) = x$ ,  $-\pi \leq x \leq \pi$ . The Fourier series of  $f(x)$  is \_\_\_\_\_.

Options :

1. ✓  $2(\sin x - \frac{1}{2}\sin 2x + \frac{1}{3}\sin 3x - \dots)$

2. ✗  $2(\sin x + \frac{1}{2}\sin 2x + \frac{1}{3}\sin 3x + \dots)$

3. ✗  $2(\cos x - \frac{1}{2}\cos 2x + \frac{1}{3}\cos 3x - \dots)$

4. ✗  $2(\cos x + \frac{1}{2}\cos 2x + \frac{1}{3}\cos 3x + \dots)$

Physics

|                                      |           |
|--------------------------------------|-----------|
| Section Id :                         | 89465857  |
| Section Number :                     | 2         |
| Section type :                       | Online    |
| Mandatory or Optional:               | Mandatory |
| Number of Questions:                 | 25        |
| Number of Questions to be attempted: | 25        |
| Section Marks:                       | 25        |
| Display Number Panel:                | Yes       |
| Group All Questions:                 | No        |

|                              |          |
|------------------------------|----------|
| Sub-Section Number:          | 1        |
| Sub-Section Id:              | 89465862 |
| Question Shuffling Allowed : | Yes      |

Question Number : 51 Question Id : 8946582855 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The dimensional formula for gravitational constant is \_\_\_\_\_.

Options :

1. ✓  $L^3T^{-2}M^{-1}$

2. ✗  $L^3T^2M^{-1}$

3. ✗  $L^2T^3M^{-2}$

4. ✗  $L^3T^1M^{-3}$



Question Number : 52 Question Id : 8946582856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The dimensions of the quantities in one of the following pairs are same. Identify the pairs.

Options :

1. ✓ torque and work
2. ✗ angular momentum and work
3. ✗ energy and Young's modules
4. ✓ light year and wavelength

Note: For this question, ambiguity is found in question/answer. Candidate will get full marks for this question if any of the correct options are chosen.

Question Number : 53 Question Id : 8946582857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is not correct?

Options :

1. ✗  $j \times i = -k$
2. ✗  $k \times j = -i$
3. ✗  $i \times k = -j$
4. ✓  $k \times i = -j$

Question Number : 54 Question Id : 8946582858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $0.5 i + 0.8 j + c k$  is a unit vector then  $c$  is \_\_\_\_\_.

Options :

1. ✗  $\sqrt{0.89}$
2. ✗ 0.2
3. ✗ 0.3

4. ✓  $\sqrt{0.11}$

Question Number : 55 Question Id : 8946582859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which of the following is correct?

Options :

1. ✗  $A.B \neq B.A$

2. ✓  $A.(B+C) = A.B + C.A$

3. ✗  $A.B = A.B - A.C$

4. ✗  $A.B = -B.A$

Question Number : 56 Question Id : 8946582860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The acceleration due to gravity on the surface of the earth is given by \_\_\_\_\_

Options :

1. ✗  $G$

2. ✓  $GM/R^2$

3. ✗  $GM/R$

4. ✗  $GM$

Question Number : 57 Question Id : 8946582861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The value of  $g$  is maximum at \_\_\_\_\_.

Options :

1. ✗ equator

2. ✓ Pole

3. ✘ higher altitudes

4. ✘ at the centre of the earth

Question Number : 58 Question Id : 8946582862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

When the speed of rotation of earth increases your weight \_\_\_\_\_

Options :

1. ✘ increases

2. ✔ decreases

3. ✘ remains constant

4. ✘ becomes zero

Question Number : 59 Question Id : 8946582863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The value of G is zero at \_\_\_\_\_

Options :

1. ✔ nowhere

2. ✘ the centre of the earth

3. ✘ surface of the earth

4. ✘ pole

Question Number : 60 Question Id : 8946582864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If the linear momentum is increased by 50%, the kinetic energy will be increased  
by \_\_\_\_\_

Options :

1. ✘ 50%

2. ✘ 100%

3. ✔ 125%

4. ✘ 25%

Question Number : 61 Question Id : 8946582865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A metallic block slides down a smooth inclined plane when released from the top, while the other falls freely from the same point, then \_\_\_\_\_

Options :

1. ✔ both will reach the ground with the same velocity

2. ✘ both will reach the ground together

3. ✘ both will reach the ground travelling with same acceleration

4. ✘ the block sliding down the plane will strike earlier

Question Number : 62 Question Id : 8946582866 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A long spring is stretched by 2 cm and its potential energy is  $u$ . If the spring is stretched by 10 cm, then the potential energy stored in it will be \_\_\_\_\_.

Options :

1. ✘  $u/24$

2. ✘  $u/5$

3. ✘  $5u$

4. ✔  $25u$

Question Number : 63 Question Id : 8946582867 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Two masses of 1 gm and 4 gm are moving with equal kinetic energies. The ratio of the magnitudes of their linear momentum is \_\_\_\_\_

Options :

1. ✘ 4:1

2. ✘  $\sqrt{2}:1$

3. ✔ 1:2

4. ✘ 1:16

Question Number : 64 Question Id : 8946582868 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A body is dropped from rest at height 0.5 m. What will be its velocity when it just strikes the ground?

Options :

1. ✘ 7 m/s

2. ✘ 9.8 m/s

3. ✘ 4.9 m/s

4. ✔  $\sqrt{9.8}$  m/s

Question Number : 65 Question Id : 8946582869 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A particle moves such that its acceleration  $a$  is given by  $a = -bx$  where  $x$  is the displacement from equilibrium and  $b$  is a constant. The period of Oscillation is \_\_\_\_\_ .

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1.  $2\pi b$

2.  $2\pi\sqrt{b}$

3.  $2\pi/b$

4.  $2\sqrt{\pi}/b$

Question Number : 66 Question Id : 8946582870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A particle is vibrating in simple harmonic motion with amplitude of 4 cm. At what displacement from the equilibrium position is its energy half potential and half kinetic?

Options :

1. ✘ 1 cm

2. ✘  $\sqrt{2}$  cm

3. ✘ 2 cm

4. ✔  $2\sqrt{2}$  cm

Question Number : 67 Question Id : 8946582871 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When a star approaches the earth, the waves are shifted towards \_\_\_\_\_

Options :

1. ✘ green colour

2. ✘ yellow colour

3. ✔ blue end

4. ✘ red end

Question Number : 68 Question Id : 8946582872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If a tuning fork of frequency 90 is sounded and moved towards an observer with a velocity equal to one tenth the velocity of sound, then the note heard by the observer will have frequency\_\_\_\_\_.

Options :

1. ✓ 100
2. ✗ 90
3. ✗ 80
4. ✗ 900

Question Number : 69 Question Id : 8946582873 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the most important factor which helps to recognise a person by his/her voice alone\_\_\_\_\_

Options :

1. ✓ quality
2. ✗ pitch
3. ✗ intensity
4. ✗ quality, pitch and intensity

Question Number : 70 Question Id : 8946582874 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The quality of tone\_\_\_\_\_

Options :

1. ✗ decreases with loudness
2. ✗ varies inversely as amplitude
3. ✗ varies directly as pitch

4. ✓ depends on the overtones present

Question Number : 71 Question Id : 8946582875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The conduction of heat from hot body to cold body is an example of \_\_\_\_\_.

Options :

1. ✗ reversible process

2. ✓ irreversible process

3. ✗ isothermal process

4. ✗ isobaric process

Question Number : 72 Question Id : 8946582876 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

From the isothermal drawn from Andrews experiment, it can be inferred that \_\_\_\_\_

Options :

1. ✗ CO<sub>2</sub> is a perfect gas

2. ✓ there is continuity of state

3. ✗ there is discontinuity of state

4. ✗ gases like CO<sub>2</sub> and H<sub>2</sub> cannot be liquefied

Question Number : 73 Question Id : 8946582877 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A diesel cycle works at \_\_\_\_\_

Options :

1. ✗ constant volume

2. ✓ constant pressure



3. ✘ constant temperature

4. ✘ both constant volume and constant temperature

Question Number : 74 Question Id : 8946582878 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The transition temperature of most low temperature superconducting elements is in the  
range of \_\_\_\_\_

Options :

1. ✔ zero to 10 k

2. ✘ 10 k to 20 k

3. ✘ 20 k to 50 k

4. ✘ 50 k alone

Question Number : 75 Question Id : 8946582879 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Propagation of light through fiber core is due to \_\_\_\_\_

Options :

1. ✘ diffraction

2. ✘ interference

3. ✔ total internal reflection

4. ✘ reflection

Chemistry

Section Id :

89465858

Section Number :

3

Section type :

Online

Mandatory or Optional:

Mandatory

Number of Questions:

25

Number of Questions to be attempted:

25

|                       |     |
|-----------------------|-----|
| Section Marks:        | 25  |
| Display Number Panel: | Yes |
| Group All Questions:  | No  |

|                              |          |
|------------------------------|----------|
| Sub-Section Number:          | 1        |
| Sub-Section Id:              | 89465863 |
| Question Shuffling Allowed : | Yes      |

Question Number : 76 Question Id : 8946582880 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which of the following energy orders is correct?

Options :

1.  $6s < 4f < 5d < 6p$
2.  $4f < 5d < 6s < 6p$
3.  $4f < 6s < 6p < 5d$
4.  $6s < 6p < 5d < 4f$

Question Number : 77 Question Id : 8946582881 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

An element A of atomic number 11 combines with an element B of atomic number 17. The compound formed is \_\_\_\_\_.

Options :

1. Covalent AB
2. Ionic AB
3. Covalent AB<sub>2</sub>
4. Ionic AB<sub>2</sub>

Question Number : 78 Question Id : 8946582882 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The oxidation number of 'S' in S<sub>8</sub>, S<sub>2</sub>F<sub>2</sub>, H<sub>2</sub>S respectively are \_\_\_\_\_.

Options :

1. ✓ 0, +1 and -2
2. ✗ +2, +1 and -2
3. ✗ 0, +1 and +2
4. ✗ -2, +1 and -2

Question Number : 79 Question Id : 8946582883 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The elements A, B, C and D have the following electronic configurations:

A:  $1S^2, 2S^2, 2P^1$

B:  $1S^2, 2S^2, 2P^6, 3S^2, 3P^1$

C:  $1S^2, 2S^2, 2P^6, 3S^2, 3P^3$

D:  $1S^2, 2S^2, 2P^6, 3S^2, 3P^5$

The elements that belong to same group are \_\_\_\_\_.

Options :

1. ✗ A and C
2. ✗ C and D
3. ✗ A and D
4. ✓ A and B

Question Number : 80 Question Id : 8946582884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

4.9 gm of  $H_2SO_4$  is present in 2 lit of its solution. The molarity of the solution is

\_\_\_\_\_.

Options :

1. ✘ 0.1 M

2. ✔ 0.025 M

3. ✘ 0.25 M

4. ✘ 0.01 M

Question Number : 81 Question Id : 8946582885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The molecular weight of  $\text{H}_3\text{PO}_4$  is 98. The equivalent weight is \_\_\_\_\_ gram / equivalents.

Options :

1. ✘ 98

2. ✘ 49

3. ✔ 32.66

4. ✘ 24.5

Question Number : 82 Question Id : 8946582886 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is the Bronsted acid?

Options :

1. ✘  $\text{Cl}^-$

2. ✘  $\text{NH}_2^-$

3. ✘  $\text{CH}_3\text{COO}^-$

4. ✔  $\text{NH}_4^+$

Question Number : 83 Question Id : 8946582887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The pH of 1 M KOH is \_\_\_\_\_.

Options :

1. ✘ 12

2. ✘ 11

3. ✔ 14

4. ✘ 13

Question Number : 84 Question Id : 8946582888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Froth floatation process is used for the \_\_\_\_\_.

Options :

1. ✘ Oxide ores

2. ✔ Sulphide ores

3. ✘ Chloride ores

4. ✘ Oxide ores and Chloride ores

Question Number : 85 Question Id : 8946582889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The composition of brass is \_\_\_\_\_.

Options :

1. ✔ Cu and Zn

2. ✘ Cu and Ni

3. ✘ Cu and Mn

4. ✘ Cu and Fe

Question Number : 86 Question Id : 8946582890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is correct?

Options :

1. ✘ Cathode is positive terminal in an electrolytic cell
2. ✘ Cathode is negative terminal in a galvanic cell
3. ✔ Reduction occurs at cathode in either of cells
4. ✘ Oxidation occurs at cathode in either of cells

Question Number : 87 Question Id : 8946582891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the electrolysis of  $\text{CuCl}_2$  solution using copper electrode, if 2.5 gm of Cu is deposited at cathode, then at anode \_\_\_\_\_.

Options :

1. ✘ 890 mL of  $\text{Cl}_2$  at STP is liberated
2. ✘ 445 mL of  $\text{O}_2$  at STP is liberated
3. ✘ 2.5 gm of copper is deposited
4. ✔ a decrease of 2.5 gm of mass takes place

Question Number : 88 Question Id : 8946582892 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The unit of resistivity is \_\_\_\_\_.

Options :

1. ✘  $\Omega$
2. ✔  $\Omega \text{ m}$

3. ✘  $\Omega / m$

4. ✘  $\Omega m^2$

Question Number : 89 Question Id : 8946582893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following metals provide cathodic protection to iron?

Options :

1. ✘ Cu and Ni

2. ✔ Al and Zn

3. ✘ Al and Cu

4. ✘ Co and Ni

Question Number : 90 Question Id : 8946582894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The chemical composition of rust is \_\_\_\_\_.

Options :

1. ✘  $Fe_3O_4$

2. ✘  $Fe_3O_3$

3. ✔  $Fe_2O_3 \cdot nH_2O$

4. ✘  $Fe_3O_3 \cdot xH_2O$

Question Number : 91 Question Id : 8946582895 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

1 ppm of hardness of water is equal to \_\_\_\_\_.

Options :

1. ✔ 1 part of  $CaCO_3$  hardness in  $10^6$  parts of water

2. ✘ 1 part of  $\text{CaCO}_3$  hardness in  $10^8$  parts of water
3. ✘ 1 part of  $\text{CaCO}_3$  hardness in  $10^7$  parts of water
4. ✘ 1 part of  $\text{CaCO}_3$  hardness in  $10^5$  parts of water

Question Number : 92 Question Id : 8946582896 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The temporary hardness of water is due to the presence of \_\_\_\_\_.

Options :

1. ✘  $\text{MgCl}_2$  and  $\text{CaCl}_2$
2. ✘  $\text{Ca}(\text{NO}_3)_2$  and  $\text{Mg}(\text{NO}_3)_2$
3. ✘  $\text{CaSO}_4$  and  $\text{MgSO}_4$
4. ✔  $\text{Ca}(\text{HCO}_3)_2$  and  $\text{Mg}(\text{HCO}_3)_2$

Question Number : 93 Question Id : 8946582897 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The basic buffer solution is a mixture of \_\_\_\_\_.

Options :

1. ✔  $\text{NH}_3 + \text{NH}_4\text{Cl}$
2. ✘  $\text{HCl} + \text{NH}_4\text{Cl}$
3. ✘  $\text{NaCl} + \text{NH}_4\text{Cl}$
4. ✘  $\text{KOH} + \text{NH}_4\text{Cl}$

Question Number : 94 Question Id : 8946582898 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following polymers has amide linkage?

Options :



1. ✘ Terylene
2. ✘ Bakelite
3. ✔ Nylon
4. ✘ PVC

Question Number : 95 Question Id : 8946582899 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The monomer of natural rubber is \_\_\_\_\_.

Options :

1. ✘ Butadiene
2. ✘ Chloroprene
3. ✘ 2-methyl 1,2 butadiene
4. ✔ 2-methyl 1,3 butadiene

Question Number : 96 Question Id : 8946582900 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is a thermo setting?

Options :

1. ✔ Bakelite
2. ✘ Polyethylene
3. ✘ Nylon-6
4. ✘ Natural rubber

Question Number : 97 Question Id : 8946582901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The composition of water gas is \_\_\_\_\_.

Options :

1. ✓ CO and H<sub>2</sub> are combustible gases and CO<sub>2</sub> and N<sub>2</sub> are non-combustible gases
2. ✗ CO + CO<sub>2</sub> are combustible gases and H<sub>2</sub>O and N<sub>2</sub> non-combustible gases
3. ✗ CO + N<sub>2</sub> are combustible gases and H<sub>2</sub>O and H<sub>2</sub> are non-combustible gases
4. ✗ N<sub>2</sub>+H<sub>2</sub> are combustible gases and CO + H<sub>2</sub>O are non-combustible gases

Question Number : 98 Question Id : 8946582902 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Earth is protected from UV radiation by \_\_\_\_\_.

Options :

1. ✗ Nitrogen layer
2. ✓ Ozone layer
3. ✗ Carbon dioxide layer
4. ✗ Oxygen layer

Question Number : 99 Question Id : 8946582903 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of following statements is not correct?

Options :

1. ✗ CO is the main air pollutant
2. ✗ All pollutants are not wastes
3. ✓ Water is polluted by dissolved Oxygen
4. ✗ Lichens are pollution indicators

Question Number : 100 Question Id : 8946582904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Minamata disease is caused due to the presence of \_\_\_\_\_.

Options :

1. ✘ Cd
2. ✘ Pb
3. ✘ As
4. ✔ Hg

Electronics and Instrumentation Engineering

|                                      |           |
|--------------------------------------|-----------|
| Section Id :                         | 89465859  |
| Section Number :                     | 4         |
| Section type :                       | Online    |
| Mandatory or Optional:               | Mandatory |
| Number of Questions:                 | 100       |
| Number of Questions to be attempted: | 100       |
| Section Marks:                       | 100       |
| Display Number Panel:                | Yes       |
| Group All Questions:                 | No        |

|                              |          |
|------------------------------|----------|
| Sub-Section Number:          | 1        |
| Sub-Section Id:              | 89465864 |
| Question Shuffling Allowed : | Yes      |

Question Number : 101 Question Id : 8946582905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$R_1 = 36 \Omega$  and  $R_2 = 75 \Omega$ , each having tolerance of  $\pm 5\%$  are connected in series.

The value of resultant resistance is

Options :

1. ✘  $111 \pm 0 \Omega$ .
2. ✘  $111 \pm 2.77 \Omega$ .
3. ✔  $111 \pm 5.55 \Omega$ .
4. ✘  $111 \pm 7.23 \Omega$ .

Question Number : 102 Question Id : 8946582906 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Pick the incorrect statement among the following

Options :

1. ✘ inductor is a passive element
2. ✘ current source is an active element
3. ✘ resistor is a passive element
4. ✔ voltage source is a passive element

Question Number : 103 Question Id : 8946582907 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Thevenin impedance  $Z_{Th}$  is found

Options :

1. ✘ by short-circuiting the given two terminals
2. ✘ between any two open terminals
3. ✘ by removing voltage sources along with the internal resistances
4. ✔ between same open terminals as for  $V_{Th}$

Question Number : 104 Question Id : 8946582908 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which among the following is also regarded as 'Dual of Thevenin's Theorem'?

Options :

1. ✔ Norton's Theorem
2. ✘ Superposition Theorem
3. ✘ Millman's Theorem
4. ✘ Maximum Power Transfer Theorem

Question Number : 105 Question Id : 8946582909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In A.C generator increasing number of turns in coil

Options :

1. ✘ Decreases the EMF
2. ✔ Increases the EMF
3. ✘ EMF remains same
4. ✘ EMF becomes zero

Question Number : 106 Question Id : 8946582910 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Most seven-segment displays are driven with an encoder that converts a binary encoded nibble into a \_\_\_\_\_ .

Options :

1. ✘ binary number
2. ✔ numeric number
3. ✘ octal number
4. ✘ hexadecimal number

Question Number : 107 Question Id : 8946582911 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Phototransistor produces more current than a photodiode because

Options :

1. ✘ the phototransistor can be more heavily doped than the photodiode
2. ✘ the photo transistor accepts a wider spectrum of light than the photodiode
3. ✔ the current produced by photons is amplified by the  $h_{fe}$  of the transistor
4. ✘ the photodiode is normally used in low light conditions

Question Number : 108 Question Id : 8946582912 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For which of the following, the parameters spatial-peak, temporal-average and pulse-average must be considered when expressing values for ultrasound?

Options :

1. ✓ intensity
2. ✗ absorption
3. ✗ velocity
4. ✗ pulse rate

Question Number : 109 Question Id : 8946582913 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The current density of a photo voltaic cell ranges from

Options :

1. ✗  $10 - 20 \text{ mA/cm}^2$
2. ✓  $40 - 50 \text{ mA/cm}^2$
3. ✗  $20 - 40 \text{ mA/cm}^2$
4. ✗  $60 - 100 \text{ mA/cm}^2$

Question Number : 110 Question Id : 8946582914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a second order system, the time constant  $t$  of exponential envelopes depends

Options :

1. ✗ only on damping factor
2. ✗ only on natural frequency
3. ✗ both on damping factor and natural frequency
4. ✓ neither on damping factor nor on natural frequency

Question Number : 111 Question Id : 8946582915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If poles are added to the system, where will the system tend to shift the root locus?

Options :

1. ✘ to the left of an imaginary axis
2. ✔ to the right of an imaginary axis
3. ✘ at the center
4. ✘ no shifting takes place

Question Number : 112 Question Id : 8946582916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the unity feedback system is given by the open loop transfer function

$G(s) = ks^2 / [(1 + 0.3s)(1 + 0.05s)]$ , what would be the initial slope of magnitude plot?

Options :

1. ✘ 20 dB/decade
2. ✔ 40 dB/decade
3. ✘ 60 dB/decade
4. ✘ unpredictable

Question Number : 113 Question Id : 8946582917 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A system has the characteristic equation  $s^3 + 4Ks^2 + (5+K)s + 10 = 0$  The range of K for a stable system is:

Options :

1. ✘  $0 < K < 0.46$
2. ✘  $K < 0$
3. ✔  $K > 0.46$
4. ✘ unstable for all K

Question Number : 114 Question Id : 8946582918 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Utilizing the Routh-Hurwitz criterion, determine whether the following poly-nomials are stable or unstable:  $p_1(s)=s^2+10s+5=0$ ,  $p_2(s)=s^4+s^3+5s^2+20s+10=0$

Options :

1. ✘  $p_1(s)$  is unstable,  $p_2(s)$  is stable
2. ✔  $p_1(s)$  is stable,  $p_2(s)$  is unstable
3. ✘  $p_1(s)$  is unstable,  $p_2(s)$  is unstable
4. ✘  $p_1(s)$  is stable,  $p_2(s)$  is stable

Question Number : 115 Question Id : 8946582919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The following statements are made

- A. Use no derivative action if the process signal is “noisy”
- B. Use proportional action sparingly if the process signal is “noisy”

Options :

1. ✘ A is true B is False
2. ✘ A is false and B is true
3. ✔ A is true and B is true
4. ✘ A is False and B also False

Question Number : 116 Question Id : 8946582920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The step error coefficient of a system  $G(s) = 1/(s+6)(s+1)$  with unity feedback is

Options :

1. ✔  $1/6$
2. ✘  $\infty$
3. ✘  $0$



4. ✘ 1

Question Number : 117 Question Id : 8946582921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A diode is operating in forward region and the forward voltage and current are  $v = 3 + 0.3 \sin wt$  volts and  $i = 5 + 0.2 \sin wt$  mA. The average power dissipated is

Options :

- 1. ✘ 20 mW
- 2. ✔ about 15 mW
- 3. ✘ about 1.5 mW
- 4. ✘ 150 mW

Question Number : 118 Question Id : 8946582922 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A bimetallic thermometer essentially consists of a bimetallic strip made up of two strips of \_\_\_\_\_ welded together

Options :

- 1. ✔ different metals
- 2. ✘ same metals
- 3. ✘ one metal and one insulator
- 4. ✘ one semiconductor and one metal

Question Number : 119 Question Id : 8946582923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Derivative control action is effective

Options :

- 1. ✘ only during steady state periods

2. ✓ only during transient state periods
3. ✗ during both steady state and transient state periods
4. ✗ either during steady state or transient state periods

Question Number : 120 Question Id : 8946582924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a bipolar transistor \_\_\_\_\_.

Options :

1. ✓  $\beta_{dc} = \alpha_{dc} / 1 - \alpha_{dc}$
2. ✗  $\beta_{dc} = \alpha_{dc} / 1 + \alpha_{dc}$
3. ✗  $\beta_{dc} = 1 - \alpha_{dc} / \alpha_{dc}$
4. ✗  $\beta_{dc} = 1 + \alpha_{dc} / \alpha_{dc}$

Question Number : 121 Question Id : 8946582925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A transistor has a current gain ( $\beta$ ) of 150. Find the emitter current if base current ( $I_B$ ) is  $10\mu\text{A}$ .

Options :

1. ✗ 1.50 mA
2. ✗ 1.1 mA
3. ✗ 1.0 mA
4. ✓ 1.51 mA

Question Number : 122 Question Id : 8946582926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is the total phase shift requirement, around the feedback loop, for a phase-shift oscillator?

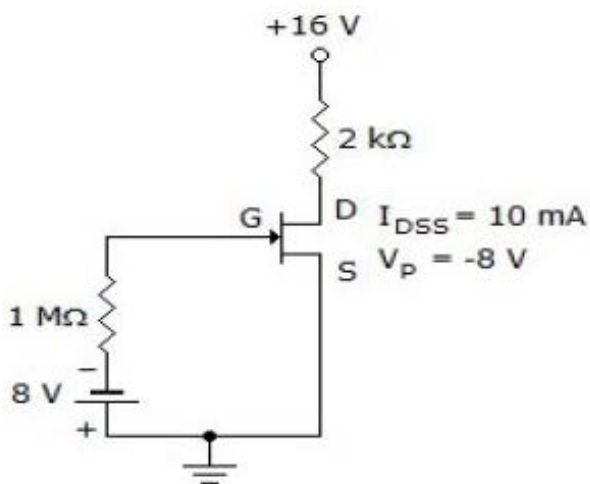
Options :

1. ✘ 90
2. ✘ 180
3. ✘ 270
4. ✔ 360

Question Number : 123 Question Id : 8946582927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the value of the  $V_{DS}$  in the circuit shown below



Options :

1. ✘ 10 V
2. ✘ 8 V
3. ✘ 4.75 V
4. ✔ 16 V

Question Number : 124 Question Id : 8946582928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The gain of an amplifier without feedback is 100 dB. If a negative feedback of 3 dB is applied, the gain of the amplifier will become

Options :

1. ✘ 5dB
2. ✘ 300dB
3. ✘ 103dB
4. ✔ 97dB

Question Number : 125 Question Id : 8946582929 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the efficiency of a class B amplifier for a supply voltage of 20 V and peak voltage of 10V.

Options :

1. ✘ 50%
2. ✔ 39.27 %
3. ✘ 29.37%
4. ✘ 61.73%

Question Number : 126 Question Id : 8946582930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the analysis of a common emitter amplifier, which of the following may be neglected?

Options :

1. ✔  $h_{re}$
2. ✘  $h_{ve}$
3. ✘  $h_{fe}$
4. ✘  $h_{ie}$

Question Number : 127 Question Id : 8946582931 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Express the 72.45 decimal number in octal number?

Options :

1. ✘ 109.24

2. ✔ 110.34

3. ✘ 111.54

4. ✘ 112.43

Question Number : 128 Question Id : 8946582932 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Add +64 and -29 numbers using 2's complement method

Options :

1. ✔ 0010 0011

2. ✘ 0110 1100

3. ✘ 1101 1001

4. ✘ 1001 0110

Question Number : 129 Question Id : 8946582933 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Simplify the expression  $ABC + \bar{A}BC + A\bar{B}C + AB\bar{C} + A\bar{B}\bar{C} + \bar{A}B\bar{C} + \bar{A}\bar{B}\bar{C}$

Options :

1. ✘  $A + \bar{B}\bar{C}$

2. ✘  $\bar{A} + \bar{B} + \bar{C}$

3. ✘  $\bar{A}B + C$

4. ✔  $A + B + \bar{C}$

Question Number : 130 Question Id : 8946582934 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Obtain the canonical sum of products of  $f = x_1x_2x_3 + x_1x_3x_4 + x_1x_2x_4$

Options :

1. ✘  $f = x_1\bar{x}_2x_3x_4 + x_1x_2x_3\bar{x}_4 + x_1x_2\bar{x}_3x_4 + x_1\bar{x}_2x_3x_4$

2. ✔  $f = x_1x_2x_3x_4 + x_1x_2x_3\bar{x}_4 + x_1x_2\bar{x}_3x_4 + x_1\bar{x}_2x_3x_4$

3. ✘  $f = x_1\bar{x}_2x_3x_4 + x_1\bar{x}_2x_3\bar{x}_4 + x_1x_2\bar{x}_3x_4 + x_1\bar{x}_2x_3x_4$

4. ✘  $f = \bar{x}_1x_2x_3x_4 + x_1x_2x_3\bar{x}_4 + x_1x_2\bar{x}_3x_4 + x_1\bar{x}_2x_3\bar{x}_4$

Question Number : 131 Question Id : 8946582935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Apply De Morgan's theorem to  $\overline{(\bar{A} + B + C + D) + \overline{A\bar{B}\bar{C}D}}$

Options :

1. ✘  $\bar{A}\bar{B}\bar{C}\bar{D}$

2. ✘  $\bar{A}BC\bar{D}$

3. ✔  $A\bar{B}\bar{C}D$

4. ✘  $ABCD$

Question Number : 132 Question Id : 8946582936 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Using K-map, obtain the minimum product of sum for

$$f(w, x, y, z) = \sum(1,3,4,5,6,7,9,12,13)$$

Options :

1. ✔  $f = (\bar{w} + \bar{y})(x + z)$

2. ✘  $f = (\bar{x} + \bar{z})(x + z)$

3. ✘  $f = (x + \bar{y})(x + z)$

4. ✘  $f = (\bar{x} + z)(x + z)$

Question Number : 133 Question Id : 8946582937 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When the output of an AND gate is HIGH with three inputs, A, B, and C.

Options :

1. ✘  $A = 1, B = 1, C = 0$

2. ✘  $A = 0, B = 0, C = 0$

3. ✔  $A = 1, B = 1, C = 1$

4. ✘  $A = 1, B = 0, C = 1$

Question Number : 134 Question Id : 8946582938 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 2-input NOR gate is equivalent to a \_\_\_\_\_

Options :

1. ✘ negative-OR gate

2. ✔ negative-AND gate

3. ✘ negative-NAND gate

4. ✘ negative-NOR gate

Question Number : 135 Question Id : 8946582939 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The output of an exclusive-OR gate is LOW if \_\_\_\_\_

Options :

1. ✔ the inputs are equal

2. ✘ one input is HIGH and the other input is LOW

3. ✘ it is independent of inputs

4. ✘ one input is LOW and the other output is HIGH

Question Number : 136 Question Id : 8946582940 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For the minterm designation  $Y = \sum m (1, 3, 5, 7)$  the complete expression is \_\_\_\_\_

Options :

1. ✘  $Y = \bar{A} \bar{B} C + A \bar{B} C$

2. ✘  $Y = \bar{A} \bar{B} C + A \bar{B} C + A B C + \bar{A} B C$

3. ✘  $Y = \bar{A} \bar{B} C + A \bar{B} C + \bar{A} B C + A \bar{B} C$

4. ✔  $Y = \bar{A} \bar{B} \bar{C} + A B C + \bar{A} \bar{B} C + A \bar{B} C$

Question Number : 137 Question Id : 8946582941 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a clocked NAND latch, race around condition occurs when \_\_\_\_\_

Options :

1. ✘ R and S are high and CLK is low

2. ✘ R and CLK are high and S is low

3. ✔ R, CLK, S are high

4. ✘ R, CLK, S are low

Question Number : 138 Question Id : 8946582942 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Latches constructed with NOR and NAND gates tend to remain in the latched condition due to which configuration feature?

Options :

1. ✘ low input voltages



2. ✘ synchronous operation

3. ✘ gate impedance

4. ✔ cross coupling

Question Number : 139 Question Id : 8946582943 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Characteristic equation of the S-R latch is \_\_\_\_\_

Options :

1. ✘  $Q_{n+1} = (S + R)Q_n$

2. ✔  $Q_{n+1} = (S + Q_n \bar{R})$

3. ✘  $Q_{n+1} = (\bar{S} + R)Q_n$

4. ✘  $Q_{n+1} = Q_n$

Question Number : 140 Question Id : 8946582944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the output of two-bit asynchronous binary up counter using T flip flops is '00' at reset condition, then what output will be generated after the fourth negative clock edge?

Options :

1. ✔ 00

2. ✘ 01

3. ✘ 10

4. ✘ 11

Question Number : 141 Question Id : 8946582945 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

What is toggle condition in J-K flip flop ?

Options :

1. ✘ J=0, K=0
2. ✘ J=0, K=1
3. ✘ J=1, K=0
4. ✔ J=1, K=1

Question Number : 142 Question Id : 8946582946 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is correct for a gated D-type flip-flop?

Options :

1. ✔ the Q output is either SET or RESET as soon as the D input goes HIGH or LOW
2. ✘ the output complement follows the input when enabled
3. ✘ only one of the inputs can be HIGH at a time
4. ✘ the output toggles if one of the inputs is held HIGH

Question Number : 143 Question Id : 8946582947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

How many IC74154 (4 to 16 decoder) IC's are necessary to decode a six digit binary number?

Options :

1. ✔ 4
2. ✘ 3
3. ✘ 2
4. ✘ 1

Question Number : 144 Question Id : 8946582948 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The expression  $Y(A,B,C) = \sum m(1,3,5,6)$  is to be realized using a multiplexer. Then

Options :

1. ✘ Use 8 : 1 multiplexer and ground input lines 1, 3, 5, 6
2. ✔ Use 8 : 1 multiplexer and ground input lines 0, 2, 4, 7
3. ✘ Use 8 : 1 multiplexer and ground input lines 0, 1, 2, 3
4. ✘ Use 8 : 1 multiplexer and ground input lines 4, 5, 6, 7

Question Number : 145 Question Id : 8946582949 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Determine the limiting error (in percent) in case of an instrument reading of 83 V with a 0-150 V voltmeter having a guaranteed accuracy of 1% full scale reading.

Options :

1. ✔ 1.81 %
2. ✘ 18.1 %
3. ✘ 0.18 %
4. ✘ 11.1 %

Question Number : 146 Question Id : 8946582950 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the maximum percentage error in the sum and difference of two voltage measurements when  $V_1=100V\pm 1\%$  and  $V_2=80V\pm 5\%$ .

Options :

1. ✘  $180V\pm 2.2\%$ ,  $20V\pm 22\%$
2. ✘  $180V\pm 2.4\%$ ,  $20V\pm 23\%$
3. ✘  $180V\pm 2.6\%$ ,  $20V\pm 24\%$
4. ✔  $180V\pm 2.8\%$ ,  $20V\pm 25\%$

Question Number : 147 Question Id : 8946582951 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If carrier power is 'P' and amplitude modulation index is 'm', then the total power after modulation is \_\_\_\_\_

Options :

1. ✘ P
2. ✘ mP
3. ✘  $P(1+m)$
4. ✔  $P(1 + \frac{m^2}{2})$

Question Number : 148 Question Id : 8946582952 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A 0-1 mA meter has a sensitivity of \_\_\_\_\_

Options :

1. ✔ 1 Kw/V
2. ✘ 1 mA
3. ✘ 1 Kw
4. ✘ 1000 A

Question Number : 149 Question Id : 8946582953 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Moving iron instruments can be used as \_\_\_\_\_

Options :

1. ✘ Standard instruments for calibration of other instruments.
2. ✘ Transfer type instruments.
3. ✔ Indicator type instruments as on panels

4. ✘ PID

Question Number : 150 Question Id : 8946582954 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In D'Arsonval galvanometer, an iron core is usually used between the permanent magnet pole faces. This is used so that \_\_\_\_\_

Options :

1. ✔ flux density in the air gap becomes high thereby a large deflecting torque is produced
2. ✘ the effect of stray magnetic fields is reduced.
3. ✘ moment of inertia of moving parts becomes smaller.
4. ✘ the effect of stray magnetic fields is increased

Question Number : 151 Question Id : 8946582955 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The value of resistance as measured by a Wheatstone bridge is  $10.0 \text{ k } \Omega$  by using a voltage source of  $10.0 \text{ V}$ . The value of resistance measured by the same bridge by using  $15.0 \text{ V}$  is \_\_\_\_\_.

Options :

1. ✘  $15.0 \text{ k } \Omega$
2. ✔  $10.0 \text{ k } \Omega$
3. ✘  $16.0 \text{ k } \Omega$
4. ✘  $15.5 \text{ k } \Omega$

Question Number : 152 Question Id : 8946582956 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The reading of high impedance voltmeter V in the bridge circuit shown in given Fig.1 is \_\_\_\_\_

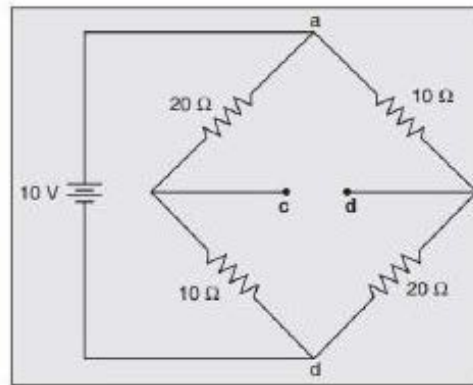


Fig.1

Options :

- 1. ✘ 0 V
- 2. ✔ 3.33 V
- 3. ✘ 4.20 V
- 4. ✘ 6.66 V

Question Number : 153 Question Id : 8946582957 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The current through a pure capacitor is \_\_\_\_\_

Options :

- 1. ✔ displacement current
- 2. ✘ conduction current
- 3. ✘ partly displacement current and Partly conduction current
- 4. ✘ either conduction current or displacement current

Question Number : 154 Question Id : 8946582958 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Maxwell inductance capacitance bridge is used for measurement of inductance of \_\_\_\_\_

Options :

1. ✘ low Q coils
2. ✔ medium Q coils
3. ✘ high Q coils
4. ✘ low and medium Q coils

Question Number : 155 Question Id : 8946582959 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Frequency can be measured by using \_\_\_\_\_

Options :

1. ✘ Maxwell bridge
2. ✘ Schering bridge
3. ✘ Heaviside Campbell bridge
4. ✔ Wien bridge

Question Number : 156 Question Id : 8946582960 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Wagner earth in AC bridge circuits is used to eliminate the effect of \_\_\_\_\_

Options :

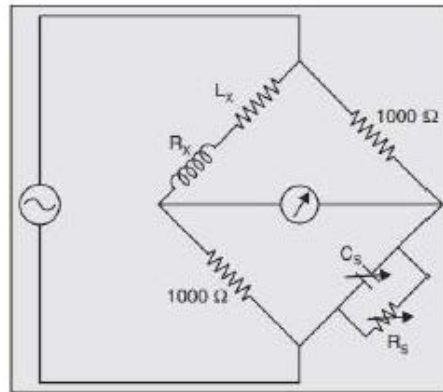
1. ✘ Stray electrostatic fields
2. ✘ Stray electromagnetic fields
3. ✔ Parasitic capacitance to earth
4. ✘ Inter-component capacitances

Question Number : 157 Question Id : 8946582961 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the bridge circuit shown in the following Fig., at balance condition, the value of  $C_s = 0.5 \mu\text{F}$  and  $R_s = 1000\Omega$ ,

The values of inductance  $L_X$  and resistance  $R_X$  are \_\_\_\_\_.



Options :

1. ✓  $L_X=0.5\text{H}, R_X=1000\Omega$
2. ✗  $L_X=0.25\text{H}, R_X=2000 \Omega$
3. ✗  $L_X=0.5\text{H}, R_X=3000 \Omega$
4. ✗  $L_X=0.25\text{H}, R_X=500 \Omega$

Question Number : 158 Question Id : 8946582962 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The source of emission of electrons in a CRT is \_\_\_\_\_

Options :

1. ✗ PN junction diode
2. ✓ A barium and strontium oxide coated cathode
3. ✗ Accelerating anodes
4. ✗ Post-accelerating anodes

Question Number : 159 Question Id : 8946582963 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which one of the following is the correct statement? Active probe used in a CRO \_\_\_\_\_

Options :



1. ✘ is bulk than passive ones
2. ✘ cannot measure small signals
3. ✔ cannot couple high frequency signals
4. ✘ can attenuate more

Question Number : 160 Question Id : 8946582964 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The X and Y inputs to a CRO are respectively  $10 \cos (100t + \theta)$  and  $10 \sin (wt + \theta)$  the resulting Lissajous pattern is

Options :

1. ✘ a straight line inclined at an angle  $\theta$
2. ✘ a horizontal line
3. ✘ an ellipse with axis making an angle  $\theta$
4. ✔ a circle

Question Number : 161 Question Id : 8946582965 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which one of the following transducers requires power supply for its operation \_\_\_\_\_

Options :

1. ✘ Thermocouple
2. ✘ Photovoltaic Cell
3. ✘ Piezoelectric Crystal
4. ✔ Thermistor

Question Number : 162 Question Id : 8946582966 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

An LVDT produces an rms output voltage of 2.6 V for displacement of 0.4  $\mu\text{m}$ . Calculate the sensitivity of LVDT

Options :

1.  6.5 V/ $\mu\text{m}$
2.  7.5 V/ $\mu\text{m}$
3.  8.5 V/ $\mu\text{m}$
4.  9.5 V/ $\mu\text{m}$

Question Number : 163 Question Id : 8946582967 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Radiation of pyrometer is used to measure temperature in the range of \_\_\_\_\_

Options :

1.   $-200^{\circ}\text{C}$  to  $500^{\circ}\text{C}$
2.   $-100^{\circ}\text{C}$  to  $-150^{\circ}\text{C}$
3.   $501^{\circ}\text{C}$  to  $1150^{\circ}\text{C}$
4.   $1200^{\circ}\text{C}$  to  $2500^{\circ}\text{C}$

Question Number : 164 Question Id : 8946582968 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Hydrometer is employed for determination of \_\_\_\_\_

Options :

1.  relative humidity
2.  specific gravity of liquids
3.  fluid level
4.  sensitivity

Question Number : 165 Question Id : 8946582969 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In optical pyrometer temperature is measured by\_\_\_\_\_

Options :

1. ✘ thermocouple effect
2. ✘ photocell principle
3. ✔ comparison of brightness of the source with that of a standard source
4. ✘ change in resistance

Question Number : 166 Question Id : 8946582970 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a piezoelectric transducer, the output voltage is given by\_\_\_\_\_

Options :

1. ✘  $V = 4 gtp$
2. ✘  $V = 2 gtp$
3. ✔  $V = gtp$
4. ✘  $V = 2 gp$

Question Number : 167 Question Id : 8946582971 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The main objective of a process control is \_\_\_\_\_

Options :

1. ✔ to control physical parameters
2. ✘ to control mechanical parameters
3. ✘ to control optical parameters
4. ✘ to control electrical parameters

Question Number : 168 Question Id : 8946582972 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

As per BIS, the number of accuracy classes of instruments is \_\_\_\_\_.

Options :

1. ✘ 5

2. ✘ 6

3. ✘ 7

4. ✔ 8

Question Number : 169 Question Id : 8946582973 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The integral controller \_\_\_\_\_

Options :

1. ✘ increases the steady state error

2. ✔ decreases the steady state error

3. ✘ increases the noise and stability

4. ✘ decreases the damping coefficient

Question Number : 170 Question Id : 8946582974 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The number of operational amplifiers required for designing the electronic PID controller  
is \_\_\_\_\_

Options :

1. ✘ 1

2. ✘ 2

3. ✔ 3

4. ✘ 4

Question Number : 171 Question Id : 8946582975 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a PID controller, the offset has been increased. The integral time constant has to be \_\_\_\_\_  
so as to reduce offset.

Options :

1. ✘ reduced
2. ✔ increased
3. ✘ exactly zero
4. ✘ no change

Question Number : 172 Question Id : 8946582976 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which controller has the potential to eliminate/overcome the drawback of offset in  
proportional controllers?

Options :

1. ✔ P-I controller
2. ✘ P-D controller
3. ✘ I-D controller
4. ✘ PID controller

Question Number : 173 Question Id : 8946582977 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which time is responsible for introducing an error in the temperature regulation of  
applications associated with ON-OFF controllers?

Options :

1. ✘ rise time
2. ✔ dead time
3. ✘ switching time
4. ✘ decay time

Question Number : 174 Question Id : 8946582978 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The basic function of the spring in a control valve is to \_\_\_\_\_

- Options :
1. ✘ characterize flow
  2. ✔ oppose the diaphragm so as to position the valve according to signal pressure
  3. ✘ close the valve if air failure occurs
  4. ✘ open the valve if air failure occurs

Question Number : 175 Question Id : 8946582979 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A single seated globe valve containing a plug  $1 \frac{1}{2}$  inches in diameter is used in a line  
pressurized to 500 psi. What actuator force is required for tight Shutoff?

- Options :
1. ✘ 884 pounds
  2. ✘ 2,000 pounds
  3. ✔ depends upon direction of flow through the valve
  4. ✘ independent of direction of flow through the valve

Question Number : 176 Question Id : 8946582980 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following gauges can measure the lowest vacuum pressure?

Options :

1. ✘ Mc Lead gauge
2. ✘ Pirani gauge
3. ✔ Ionization gauge
4. ✘ Strain gauge

Question Number : 177 Question Id : 8946582981 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The light emitting region is available in lengths from \_\_\_\_\_

Options :

1. ✘ 1.5 mm to 2.5 mm
2. ✔ 2.5 mm to 25 mm
3. ✘ 0.1 mm to 1.5 mm
4. ✘ 25 mm to 50 mm

Question Number : 178 Question Id : 8946582982 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following should be incorporated in RTD to make a temperature sensing bridge most sensitive to temperature?

Options :

1. ✘ Platinum
2. ✘ Nickel
3. ✔ Thermistor
4. ✘ Copper

Question Number : 179 Question Id : 8946582983 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Non-contact type temperature sensor is \_\_\_\_\_

Options :

1. ✘ Thermocouple
2. ✔ Radiation pyrometer
3. ✘ Thermistor
4. ✘ SCR

Question Number : 180 Question Id : 8946582984 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A message signal  $m(t) = \frac{1}{3} \cos(\omega_1 t) - \frac{1}{2} \cos(\omega_2 t)$  is amplitude modulated with a carrier of frequency  $\omega_c$  to generate  $s(t) = [1 + m(t)] \cos(\omega_c t)$ . The power efficiency achieved by this AM scheme is \_\_\_\_\_

Options :

1. ✔ 8%
2. ✘ 12%
3. ✘ 16%
4. ✘ 25%

Question Number : 181 Question Id : 8946582985 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The angle modulated signal is given by  $s(t) = 10 \cos(2\pi \cdot 2 \times 10^8 t + 1000 \cos(2000\pi t))$ . The average power of  $s(t)$  is \_\_\_\_\_

Options :

1. ✘ 100 W



2. ✘ 1000 W

3. ✔ 50 W

4. ✘ 500 W

Question Number : 182 Question Id : 8946582986 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A signal  $x(t) = 10\cos(400\pi t)$  is ideally sampled with a sampling period of  $40 \mu\text{s}$  and passed through ideal low pass filter with a cut off frequency  $1\text{KHz}$ . Which of the following frequencies is present at the output of the filter?

Options :

1. ✘ 2000 Hz

2. ✘ 1000 Hz

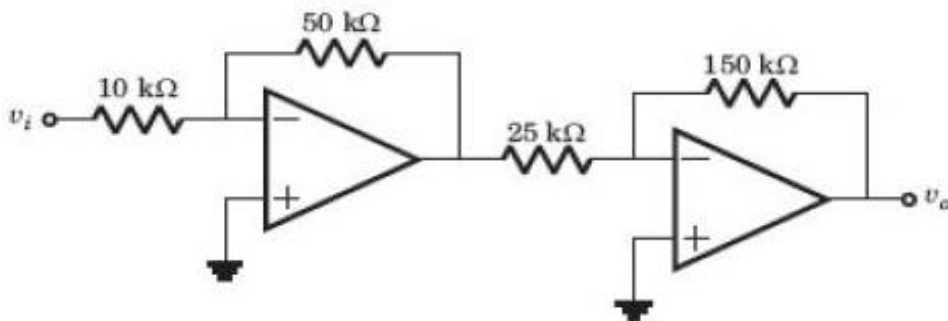
3. ✘ 1500 Hz

4. ✔ 500 Hz

Question Number : 183 Question Id : 8946582987 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In the circuit shown in figure the input voltage  $V_i = 0.2\text{V}$ . The output voltage  $V_o = ?$



Options :

1. ✘ 6V

2. ✔ -6V

3. ✘ 8V

4. ✘ -8V

Question Number : 184 Question Id : 8946582988 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a CE amplifier, the output voltage is equal to the product of \_\_\_\_\_.

(Where AC is alternating current)

Options :

1. ✔ AC collector current and AC collector resistance

2. ✘ AC base current and AC collector resistance

3. ✘ AC emitter current and AC emitter resistance

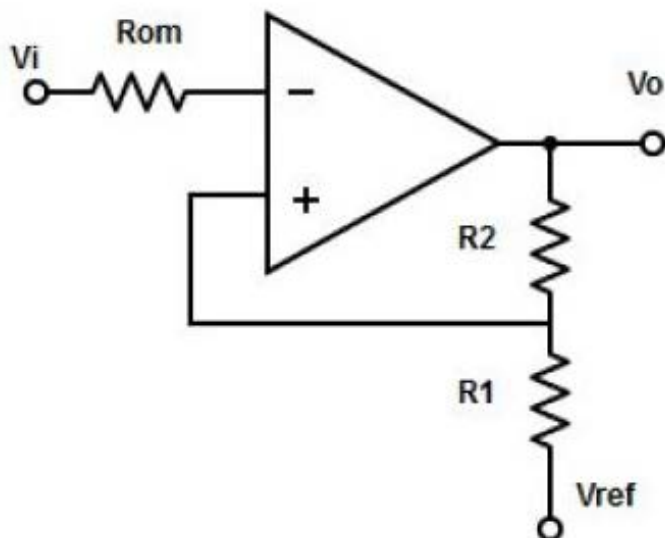
4. ✘ AC collector current and source resistance

Question Number : 185 Question Id : 8946582989 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Calculate the hysteresis voltage for the Schmitt trigger from the given specification:

$$R_2 = 56 \text{ K}\Omega, R_1 = 100 \text{ }\Omega, V_{\text{ref}} = 0 \text{ V} \text{ \& } V_{\text{sat}} = \pm 14 \text{ V.}$$



Options :

1. ✘ 0 mV

2. ✘ 25 mV

3. ✔ 50 mV

4. ✘ -25 mV

Question Number : 186 Question Id : 8946582990 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Alpha rays have a/an \_\_\_\_\_ velocity and a/an \_\_\_\_\_ range for each radioactive nuclide.

Options :

1. ✔ definite, definite

2. ✘ different, different,

3. ✘ increasing, increasing

4. ✘ decreasing, decreasing

Question Number : 187 Question Id : 8946582991 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Winemakers test grape juice before, during and after fermentation with which of the following instruments?

Options :

1. ✘ a refractometer

2. ✘ a speedometer

3. ✔ a hydrometer

4. ✘ a gyrometer

Question Number : 188 Question Id : 8946582992 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Energy passing through unit area is \_\_\_\_\_

Options :

1. ✓ intensity of x-ray
2. ✗ frequency of x-ray
3. ✗ wavelength of x-ray
4. ✗ amplitude of x-ray

Question Number : 189 Question Id : 8946582993 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Normal EEG frequency range is \_\_\_\_\_.

Options :

1. ✗ 50-500 Hz
2. ✓ 0.5-50 HZ
3. ✗ 0.05-5 Hz
4. ✗ 0.01 – 0.05 Hz

Question Number : 190 Question Id : 8946582994 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

In new spectrometers, each ion hits a/an \_\_\_\_\_.

Options :

1. ✓ detector
2. ✗ ionizer
3. ✗ collector
4. ✗ graph

Question Number : 191 Question Id : 8946582995 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The direction of induced emf is given by \_\_\_\_\_.

Options :

1. ✓ Fleming's right hand rule
2. ✗ Cork screw rule
3. ✗ Kirchoff's current law
4. ✗ Kirchoff's voltage law

Question Number : 192 Question Id : 8946582996 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Due to which phenomena, sound is heard at longer distances in nights than in day?

Options :

1. ✗ reflection
2. ✓ refraction
3. ✗ interference of sound
4. ✗ diffraction of sound

Question Number : 193 Question Id : 8946582997 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Which of the following is the chopping frequency used for industrial analyzers in the simple infrared analyzer for gas analysis?

Options :

1. ✓ 2-10 Hz
2. ✗ 11-20 Hz
3. ✗ 21-30 Hz
4. ✗ 31-40 Hz

Question Number : 194 Question Id : 8946582998 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The movement of diaphragm in simple infrared analyzer for gas analysis results in which of the following?

Options :

1. ✘ variable resistance
2. ✘ variable inductance
3. ✔ variable capacitance
4. ✘ variable conductance

Question Number : 195 Question Id : 8946582999 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Nitrogen oxide cannot be directly analyzed using UV and Visible analyzers due to which of the following reasons?

Options :

1. ✘ less accuracy
2. ✘ very low range
3. ✘ it leads to contamination of the sample
4. ✔ it is transparent in UV visible regions

Question Number : 196 Question Id : 8946583000 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

8051 microcontroller is called 8 bit since \_\_\_\_\_ .

Options :

1. ✘ it has 8 address lines
2. ✘ it has 8 data lines
3. ✘ it has 8 bit registers

4. ✓ it has 8 bit ALU

Question Number : 197 Question Id : 8946583001 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

How many 16 bit registers are there in 8051 series ?

Options :

1. ✓ 2

2. ✗ 3

3. ✗ 1

4. ✗ 0

Question Number : 198 Question Id : 8946583002 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

How is the status of the carry, auxiliary carry and parity flag affected if the instruction is written as

MOV A, #9C

ADD A, #64H

Options :

1. ✗ CY=0, AC=0, P=0

2. ✗ CY=1, AC=1, P=0

3. ✗ CY=0, AC=1, P=0

4. ✓ CY=1, AC=1, P=1

Question Number : 199 Question Id : 8946583003 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

In 8255, if  $A_1=0$ ,  $A_0=1$  then the input read cycle is performed from\_\_\_\_\_.

Options :

1. ✘ port A to data bus
2. ✔ port B to data bus
3. ✘ port C to data bus
4. ✘ CWR to data bus

Question Number : 200 Question Id : 8946583004 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

How many inputs and outputs are there in a Medium PLC?

Options :

1. ✘ 100 and 200
2. ✘ 1000 and 4000
3. ✘ 2000 and 4000
4. ✔ 4000 and 8000