

# 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>	Electrical and Electronics Engineering 11th May 2019 Shift1
<b>Subject Name:</b>	Electrical and Electronics 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

## Electrical and Electronics Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	89465821
<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>	89465879
<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: 89465889  
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 8946584009 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 : 8946584010 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 : 8946584011 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 : 8946584012 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 : 8946584013 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 : 8946584014 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 : 8946584015 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 : 8946584016 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 : 8946584017 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 : 8946584018 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 : 8946584019 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 : 8946584020 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 : 8946584021 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 : 8946584022 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 : 8946584023 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 : 8946584024 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 : 8946584025 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 : 8946584026 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 : 8946584027 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 : 8946584028 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 : 8946584029 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 : 8946584030 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  $x \frac{\partial U}{\partial x} + y \frac{\partial U}{\partial y} = \underline{\hspace{2cm}}$ .

Options :

1. ✘ 0

2. ✘  $U$

3. ✔  $-U$

4. ✘  $2U$

Question Number : 23 Question Id : 8946584031 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 : 8946584032 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 : 8946584033 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 : 8946584034 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 : 8946584035 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 : 8946584036 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 : 8946584037 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 : 8946584038 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 : 8946584039 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 : 8946584040 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 : 8946584041 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 : 8946584042 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 : 8946584043 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 : 8946584044 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 : 8946584045 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 : 8946584046 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 : 8946584047 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 : 8946584048 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 : 8946584049 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 : 8946584050 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 : 8946584051 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 : 8946584052 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 : 8946584053 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 : 8946584054 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 : 8946584055 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 : 8946584056 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 : 8946584057 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 : 8946584058 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 :	89465880
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:	89465890
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 8946584059 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 : 8946584060 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 : 8946584061 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 : 8946584062 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 : 8946584063 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 : 8946584064 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 : 8946584065 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 : 8946584066 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 : 8946584067 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 : 8946584068 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 : 8946584069 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 : 8946584070 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 : 8946584071 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 : 8946584072 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 : 8946584073 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 : 8946584074 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 : 8946584075 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 : 8946584076 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 : 8946584077 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 : 8946584078 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 : 8946584079 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 : 8946584080 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 : 8946584081 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 : 8946584082 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 : 8946584083 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 :

89465881

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:	89465891
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 8946584084 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 : 8946584085 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 : 8946584086 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 : 8946584087 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 : 8946584088 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 : 8946584089 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 : 8946584090 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 : 8946584091 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 : 8946584092 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 : 8946584093 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 : 8946584094 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 : 8946584095 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 : 8946584096 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 : 8946584097 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 : 8946584098 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 : 8946584099 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 : 8946584100 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 : 8946584101 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 : 8946584102 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 : 8946584103 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 : 8946584104 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 : 8946584105 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 : 8946584106 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 : 8946584107 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 : 8946584108 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

Electrical and Electronics Engineering

Section Id :	89465882
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:	89465892
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 8946584109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Hard magnetic materials are characterized by \_\_\_\_\_.

Options :

1. ✘ high residual magnetism and Low coercive force
2. ✔ high residual magnetism and High coercive force
3. ✘ low residual magnetism and Low coercive force
4. ✘ low residual magnetism and High coercive force

Question Number : 102 Question Id : 8946584110 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 dielectric materials, the dielectric loss angle will be \_\_\_\_\_

Options :

1. ✓ very small
2. ✗ medium
3. ✗ large
4. ✗ exactly  $90^\circ$

Question Number : 103 Question Id : 8946584111 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 suitable material used for heating elements and loading rheostats is \_\_\_\_\_

Options :

1. ✗ tungsten
2. ✓ nichrome
3. ✗ carbon
4. ✗ brass

Question Number : 104 Question Id : 8946584112 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 battery is charged at a potential of 15 volts for 8 hours when the current is 10A. The battery on discharge supplies a current of 5A for 15 hours. The mean terminal voltage during discharge is 14 volts. The watt-hour efficiency of the battery is \_\_\_\_\_.

Options :

1. ✗ 82.5%
2. ✗ 80%
3. ✗ 90%
4. ✓ 87.5%



Question Number : 105 Question Id : 8946584113 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  $v$ ,  $w$  and  $q$  stand for voltage, energy and unit positive charge respectively, then  
' $v$ ' can be expressed as \_\_\_\_\_.

Options :

1. ✘  $v = dq/dw$
2. ✘  $dv = dq/dw$
3. ✔  $v = dw/dq$
4. ✘  $v = dw.dq$

Question Number : 106 Question Id : 8946584114 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 straight parallel conductors are kept horizontally one above the other. If the upper wire suspends in air without any support, then the direction of flow of current in the wires should be \_\_\_\_\_.

Options :

1. ✘ in same direction
2. ✔ in opposite direction
3. ✘ Clock wise direction
4. ✘ Anti clock wise direction

Question Number : 107 Question Id : 8946584115 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 not correct?

Options :

1. ✘ Ohm's law is applicable for ohmic conductors only
2. ✘ KCL is derived from the law of conservation of charge

3. ✓ Superposition theorem is applicable to calculate the power in a circuit

4. ✘ Thevenin's voltage ( $V_{Th}$ ) is an open circuit voltage across the load terminals

Question Number : 108 Question Id : 8946584116 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Same mass of copper is drawn into 2 wires of 1 mm thick and 3 mm thick. Two wires are connected in series and current is passed. Heat produced in the wires is in the ratio of \_\_\_.

Options :

1. ✘ 3:1

2. ✘ 9:1

3. ✓ 81:1

4. ✘ 1:81

Question Number : 109 Question Id : 8946584117 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 current of  $i = 300t$  is suddenly applied to an inductance of 1mH. Find the induced voltage?

Options :

1. ✓ 0.3 V

2. ✘ 3 V

3. ✘ 30 V

4. ✘ 300 V

Question Number : 110 Question Id : 8946584118 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 ideal voltage source of 10 v, an ideal current source of 1A and a pure resistance of  $5\Omega$  are connected in parallel. Find the current flowing through  $5\Omega$  resistance?

Options :



1. ✘ 1 A

2. ✔ 2 A

3. ✘ 3 A

4. ✘ 4 A

Question Number : 111 Question Id : 8946584119 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 resistance of a copper wire is  $R$  ohms. The wire is stretched to its double length. The new resistance is \_\_\_\_\_  $\Omega$ .

Options :

1. ✘ R

2. ✘  $R/2$

3. ✔  $4R$

4. ✘  $2R$

Question Number : 112 Question Id : 8946584120 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  $2 \mu\text{F}$ ,  $400 \text{ V}$  capacitors needed to obtain a capacitance value of  $1.5 \mu\text{F}$  rated for  $1600 \text{ V}$ .

Options :

1. ✔ 12

2. ✘ 8

3. ✘ 6

4. ✘ 4

Question Number : 113 Question Id : 8946584121 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 armature resistance of a 6 pole lap wound d.c machine is  $0.05\Omega$ . If the armature is rewound using a wave winding, then the armature resistance will be \_\_\_\_\_.

Options :

1.   $0.45\Omega$

2.   $0.3\Omega$

3.   $0.15\Omega$

4.   $0.1\Omega$

Question Number : 114 Question Id : 8946584122 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 speed of a d.c motor increases with load torque, then it is a \_\_\_\_\_.

Options :

1.  series motor

2.  permanent magnet motor

3.  differentially compound motor

4.  cumulatively compound motor

Question Number : 115 Question Id : 8946584123 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 d.c series motor is driving a load whose torque varies as square of the speed. When the speed is 250 rpm, the line current is 15 A. If speed is 500 rpm, then the line current is likely to be \_\_\_\_\_.

Options :

1.  15 A

2.  21.2 A

3. ✓ 30 A

4. ✗ 60 A

Question Number : 116 Question Id : 8946584124 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 terminal voltage of a d.c series generator is 150 V when the load current is 5A. Take the combined resistance of armature and series field as  $1\Omega$ . If the load current is increased to 10A for the same generated e.m.f, the terminal voltage will be \_\_\_\_\_

Options :

1. ✓ 145 V

2. ✗ 155 V

3. ✗ 150 V

4. ✗ 210 V

Question Number : 117 Question Id : 8946584125 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 DC machines are tested by Hopkinson test. The rating of each machine is 250 kW. The power input during this test would be around \_\_\_\_\_

Options :

1. ✗ 250 kW

2. ✗ 375 kW

3. ✗ 500 kW

4. ✓ 50 kW

Question Number : 118 Question Id : 8946584126 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 interpole mmf is proportional to \_\_\_\_\_ .

Options :

1. ✓ armature current
2. ✗ field current
3. ✗ product of armature current and field current
4. ✗ ratio of armature current to field current

Question Number : 119 Question Id : 8946584127 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 parallel paths in the armature winding of a four pole, wave connected DC machine having 22 coil side is \_\_\_\_\_.

Options :

1. ✗ 4
2. ✓ 2
3. ✗ 22
4. ✗ 1

Question Number : 120 Question Id : 8946584128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

To have sparkles commutation, the armature reaction effect in a DC machine is neutralized by \_\_\_\_\_

Options :

1. ✓ using compensating winding and commutating poles  
shifting brush axis from the geometrical neutral axis to the magnetic neutral
2. ✓ axis
3. ✗ fixing the brush axis in alignment with the main pole axis

4. ✘ increasing the field excitation

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 : 121 Question Id : 8946584129 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 phase energy meter is operating on 230 V, 50 Hz supply with a load of 20 A for 2 hours at unity power factor. The meter makes 1380 revolutions in that period. The meter constant is \_\_\_\_\_.

Options :

1. ✘ 695 rev/kWh

2. ✔ 150 rev/kWh

3. ✘ 1000 rev/kWh

4. ✘ 1/150 rev/kWh

Question Number : 122 Question Id : 8946584130 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 moving coil instrument gives full scale deflection for 1 mA and has a resistance of 5 ohms. If a resistance of 0.55 ohms is connected in parallel to the instrument, what is the maximum value of current it can measure?

Options :

1. ✘ 100 mA

2. ✘ 50 mA

3. ✔ 10 mA

4. ✘ 5 mA

Question Number : 123 Question Id : 8946584131 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 types of instruments can be used to determine the rms value of AC voltage of high magnitude (10 kV) and of any wave shape?

Options :

1. ✘ moving iron instruments
2. ✘ dynamometer type instruments
3. ✘ induction instruments
4. ✔ electrostatic instruments

Question Number : 124 Question Id : 8946584132 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 materials is used in the fabrication of swamping resistance of a PMMC instrument?

Options :

1. ✘ copper
2. ✘ aluminum
3. ✔ manganin
4. ✘ tungsten

Question Number : 125 Question Id : 8946584133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Permanent magnet moving coil ammeters have uniform scales because \_\_\_\_\_.

Options :

1. ✘ of eddy current damping only
2. ✘ they are spring controlled only
3. ✘ their deflecting torque varies directly as current varies

they are spring controlled and deflecting torque varies directly as current

4. ✓ varies

Question Number : 126 Question Id : 8946584134 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 most efficient form of damping employed in electrical instruments is \_\_\_\_\_.

Options :

1. ✗ air-friction
2. ✗ fluid friction
3. ✓ eddy current
4. ✗ over damping

Question Number : 127 Question Id : 8946584135 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 AC series circuit consisting of a resistance of 6 ohms and an inductive reactance of 8 ohms is connected to a single phase 200 V, 50 Hz AC supply. The current flowing in the circuit would be \_\_\_\_\_.

Options :

1. ✗ 14.3 A
2. ✗ 10 A
3. ✓ 20 A
4. ✗ 25 A

Question Number : 128 Question Id : 8946584136 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 voltage and current in a circuit are given by

$$v = 10 \sin(\omega t - \pi/6), \quad i = 10 \sin(\omega t + \pi/6).$$

The power consumed is given as \_\_\_\_\_.

Options :

1. ✘ 100 W
2. ✘ 50 W
3. ✘ 86.6 W
4. ✔ 25 W

Question Number : 129 Question Id : 8946584137 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 circuit, the voltage and current are given as  $(10 + j5)$  volts and  $(6 + j4)$  amps respectively. The reactive power in the circuit is \_\_\_\_\_.

Options :

1. ✘ 70 VAR
2. ✘ 60 VAR
3. ✘ 10 VAR
4. ✔ -10 VAR

Question Number : 130 Question Id : 8946584138 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 two watt-meter method of measurement of power is used to measure power in a balanced three phase circuit, if one of the wattmeter readings is zero, then \_\_\_\_.

Options :

1. ✘ power consumed in the circuit is zero
2. ✘ power factor of the circuit is zero
3. ✘ power factor is unity

4. ✓ power factor is 0.5

Question Number : 131 Question Id : 8946584139 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 coil having a resistance of 5 ohms and inductance of 0.1 H connected in series with a capacitor of 50  $\mu\text{F}$ . A constant alternating voltage of 200 V is applied to the circuit. The voltage across the coil at resonance is \_\_\_\_\_.

Options :

1. ✗ 200 V

2. ✗ 1788 V

3. ✓ 1800 V

4. ✗ 2000 V

Question Number : 132 Question Id : 8946584140 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 impedances are connected in series. Across each impedance a voltmeter is connected and another voltmeter is connected the combination of two impedances. The phase angle between the voltages across the two impedances when all the three voltmeters read equal value \_\_\_\_\_.

Options :

1. ✗  $30^\circ$

2. ✗  $60^\circ$

3. ✗  $90^\circ$

4. ✓  $120^\circ$

Question Number : 133 Question Id : 8946584141 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 200 / 400 V ratio, single phase transformer has a secondary winding resistance of 0.5  $\Omega$ . The primary resistance is 0.1  $\Omega$ . The total resistance is referred to primary should be \_\_\_\_\_.

Options :

1. ✓ 0.225  $\Omega$
2. ✗ 0.50  $\Omega$
3. ✗ 1  $\Omega$
4. ✗ 2  $\Omega$

Question Number : 134 Question Id : 8946584142 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 regulation of two winding transformer is 5% at full load unity power factor (pf).

At full load 0.8 pf lagging the regulation would be \_\_\_\_\_.

Options :

1. ✗ 5%
2. ✗ less than 5%
3. ✓ more than 5%
4. ✗ 0%

Question Number : 135 Question Id : 8946584143 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 10 KVA, 100/300 V two winding transformer is used as an auto transformer by connecting the two windings in series to supply a 300 V load from a 400 V AC supply. The maximum KVA which can be supplied by an auto transformer is \_\_\_\_\_.

Options :

1. ✗ 10 KVA
2. ✗ Less than 10 KVA

3. ✓ 40 KVA

4. ✗ 100 KVA

Question Number : 136 Question Id : 8946584144 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 three phase transformer is composed of three transformers connected in delta-delta. Its rating is 100 KVA. If one of the units gets damaged and it is operated in open delta, then the rating will be \_\_\_\_\_.

Options :

1. ✗ 100 KVA

2. ✗ 66.6 KVA

3. ✓ 57.7 KVA

4. ✗ 50 KVA

Question Number : 137 Question Id : 8946584145 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 ratio of the primary to secondary voltage of a transformer is 2:1. If an auto transformer is used instead of a two winding transformer, then the saving in terms of weights of a copper required will be \_\_\_\_\_.

Options :

1. ✓ 50 %

2. ✗ 33.33 %

3. ✗ 66.67 %

4. ✗ 97 %

Question Number : 138 Question Id : 8946584146 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 two winding transformer has iron losses and full load copper losses equal to W watts each. It is tested along with another similar transformer for back to back test. The total power input would be \_\_\_\_\_.

Options :

1. ✓ 4 W
2. ✗ 2 W
3. ✗ 1 W
4. ✗ 0.5 W

Question Number : 139 Question Id : 8946584147 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 power factor of an alternator is zero lagging the armature reaction is \_\_\_\_\_

Options :

1. ✓ demagnetizing
2. ✗ magnetizing
3. ✗ cross magnetizing
4. ✗ demagnetizing as well as cross magnetizing

Question Number : 140 Question Id : 8946584148 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 reactive power output of a cylindrical rotor alternator is maximum when \_\_\_\_.

Options :

1. ✗  $\delta = 90^\circ$
2. ✗  $\delta = 45^\circ$
3. ✓  $\delta = 0^\circ$

4. ✘  $\delta$  is slightly less than  $90^\circ$

Question Number : 141 Question Id : 8946584149 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 full pitch coil in a synchronous machine has a span of 18 slots. To eliminate third harmonics, the coil span would be \_\_\_\_\_.

Options :

- 1. ✘ 9 slots
- 2. ✔ 12 slots
- 3. ✘ 15 slots
- 4. ✘ 18 slots

Question Number : 142 Question Id : 8946584150 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 under excited synchronous motor operates at \_\_\_\_\_.

Options :

- 1. ✔ lagging power factor
- 2. ✘ unity power factor
- 3. ✘ leading power factor
- 4. ✘ lagging power factor at low loads and leading power factor at high loads

Question Number : 143 Question Id : 8946584151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Synchronous motors are used in situations where \_\_\_\_\_.

Options :

- 1. ✘ the load is constant

2. ✘ the load is required to be driven at very large speeds
3. ✔ the load is to be driven at constant speed
4. ✘ the starting torque requirement of the load is very high

Question Number : 144 Question Id : 8946584152 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 5 HP, 3-phase, 400 V star connected squirrel cage induction motor meant to drive a milling machine. At starting the machine takes the current about \_\_\_\_\_.

Options :

1. ✔ 40 A
2. ✘ 100 A
3. ✘ 150 A
4. ✘ 200 A

Question Number : 145 Question Id : 8946584153 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 3-phase induction motor has a starting torque of 200 Nm when switched on directly to supply, if an auto transformer with 50% tapping is used for starting. The starting torque would be \_\_\_\_\_.

Options :

1. ✘ 400 Nm
2. ✘ 200 Nm
3. ✘ 100 Nm
4. ✔ 50 Nm



Question Number : 146 Question Id : 8946584154 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 400 V, 50 Hz three phase induction motor rotates at 1440 rpm on full load.

The motor is wound for \_\_\_\_\_.

Options :

1. ✘ 2-poles

2. ✔ 4-poles

3. ✘ 6-poles

4. ✘ 8-poles

Question Number : 147 Question Id : 8946584155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

While starting a three-phase induction motor, a star-delta starter is used to \_\_\_\_\_.

Options :

1. ✔ reduce the starting current

2. ✘ achieve higher starting torque

3. ✘ enable the motor to start in the right direction

4. ✘ be able to reverse the direction of the rotation

of the rotor as and when necessary

Question Number : 148 Question Id : 8946584156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Torque developed by a three-phase 400 V induction motor is 100 Nm. If the applied voltage is reduced by 200 V, then the torque developed is \_\_\_\_\_.

Options :

1. ✘ 50 Nm

2. ✓ 25 Nm

3. ✗ 200 Nm

4. ✗ 62.5 Nm

Question Number : 149 Question Id : 8946584157 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 single-phase supply is connected across a single-phase winding,  
the nature of magnetic field produced is \_\_\_\_\_.

Options :

1. ✓ pulsating in nature

2. ✗ rotating in nature

3. ✗ constant in magnitude but rotating at synchronous speed

4. ✗ constant in magnitude and direction

Question Number : 150 Question Id : 8946584158 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 capacitor start capacitor run motor has two capacitors, then \_\_\_\_\_.

Options :

1. ✗ both the capacitors are in the circuit during the starting and running

one of the capacitors is in the circuit during starting and the other is in the circuit  
during running.

2. ✗

both the capacitors are in the circuit during starting and one of them is during

3. ✓ running.

one of the capacitors is in the circuit during starting and both are in the circuit

4. ✘ during running

Question Number : 151 Question Id : 8946584159 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 order to have a lower cost of power generation, \_\_\_\_\_

Options :

1. ✘ the load factor and diversity factor should be low
2. ✔ the load factor and diversity factor should be high
3. ✘ the load factor and diversity factor should be medium
4. ✘ the load factor should be low and diversity factor should be high

Question Number : 152 Question Id : 8946584160 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 station operates with load factor and plant capacity factor of 0.75 and with a maximum demand of 100 MW. The reserve capacity is \_\_\_\_\_.

Options :

1. ✘ 100 MW
2. ✘ 75 MW
3. ✘ 133.33 MW
4. ✔ 0 MW

Question Number : 153 Question Id : 8946584161 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 hydro power plant supplied by a river with a discharge of  $3000 \text{ m}^3/\text{sec}$  at a head of 30 meters, with a plant efficiency of 79% develops a power nearly \_\_\_\_\_.

Options :

1. ✓ 697.5 MW

2. ✗ 345.2 MW

3. ✗ 823.7 MW

4. ✗ 423.12 MW

Question Number : 154 Question Id : 8946584162 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 industrial consumer has a load of 1500 kW at 0.8 pf (lag) for 12 hours and 1000 kW at u.p.f for 12 hours during the day. The daily load factor is \_\_\_\_\_.

Options :

1. ✓ 0.833

2. ✗ 0.666

3. ✗ 1.500

4. ✗ 0.800

Question Number : 155 Question Id : 8946584163 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 under the daily load curve gives \_\_\_\_\_.

Options :

1. ✗ rated power of a generating station

2. ✓ the energy generated per day

3. ✗ the power consumed per day

4. ✗ the power consumed per year



Question Number : 156 Question Id : 8946584164 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 material used for the fuse must have\_\_\_\_\_.

Options :

1. ✘ low melting point with low specific resistance
2. ✔ low melting point and high specific resistance
3. ✘ low melting point with any specific resistance
4. ✘ high melting point and low specific resistance

Question Number : 157 Question Id : 8946584165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Making capacity of circuit breaker is equal to\_\_\_\_\_.

Options :

1. ✔ 2.55 times symmetrical breaking current
2. ✘ 1.50 times symmetrical breaking current
3. ✘  $\sqrt{2}$  times symmetrical breaking current
4. ✘ 100 times symmetrical breaking current

Question Number : 158 Question Id : 8946584166 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 thyrite lightning arrester, the resistance\_\_\_\_\_.

Options :

1. ✘ varies linearly with the applied voltage
2. ✘ increases with the applied voltage
3. ✘ decreases linearly with the applied voltage

4. ✓ is high at low current and low at high current

Question Number : 159 Question Id : 8946584167 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 use of high-speed breaker \_\_\_\_\_.

Options :

1. ✗ reduces the short-circuit current
2. ✓ improves system stability
3. ✗ decreases system stability
4. ✗ increases the short-circuit current

Question Number : 160 Question Id : 8946584168 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 relay is more susceptible to electromagnetic interference?

Options :

1. ✓ digital relay
2. ✗ electro-mechanical relay
3. ✗ static relay
4. ✗ instantaneous induction cup relay

Question Number : 161 Question Id : 8946584169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Distance relay is the best example of \_\_\_\_\_.

Options :

1. ✗ unit protection scheme
2. ✓ non-unit protection scheme

3. ✘ independent protection scheme

4. ✘ differential protection scheme

Question Number : 162 Question Id : 8946584170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Switching of unloaded transformer during zero crossing of voltage wave generates \_\_\_\_\_.

Options :

1. ✔ maximum amount of magnetizing inrush current

2. ✘ minimum amount of magnetizing inrush current

3. ✘ zero amount of magnetizing inrush current

4. ✘ large harmonics

Question Number : 163 Question Id : 8946584171 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 resistance and reactance of short transmission line are equal. At zero regulation, the load will be \_\_\_\_\_.

Options :

1. ✘ unity power factor

2. ✘ zero power factor

3. ✘ 0.707 (lag)

4. ✔ 0.707 (lead)

Question Number : 164 Question Id : 8946584172 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 presence of earth in case of overhead lines \_\_\_\_\_.

Options :



1.  increases the capacitance
2.  increases the inductance
3.  decreases the capacitance
4.  decreases the inductance

Question Number : 165 Question Id : 8946584173 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 sag for a span of 350m, if the ultimate tensile strength of conductor is 5000 kg, factor of safety is 2 and weight of conductor is 0.550 kg/m is nearly \_\_\_\_\_.

Options :

1.  3.37 m
2.  6.20 m
3.  1.20 m
4.  10.8 m

Question Number : 166 Question Id : 8946584174 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 short line with a reactance of 20 ohms and negligible resistance operates with a sending end voltage of 132 kV and receiving end voltage of 126 kV. The maximum power that can be transmitted with this voltage profile is about \_\_\_\_\_.

Options :

1.  400 MW
2.  832 MW
3.  1000 MW
4.  132 MW

Question Number : 167 Question Id : 8946584175 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 string of six insulators has self capacitances equal to 10 times the pin-to-earth capacitance. The string efficiency will be around \_\_\_\_\_.

Options :

1. ✘ 30%
2. ✔ 58.48%
3. ✘ 40%
4. ✘ 55.55%

Question Number : 168 Question Id : 8946584176 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 propagation constant of a transmission line is  $(0.15 \times 10^{-3} + j 1.5 \times 10^{-3})$ . The wave length of the traveling wave is \_\_\_\_\_.

Options :

1. ✘  $(0.15 \times 10^{-3}) / (2\pi)$
2. ✔  $(2\pi) / (0.15 \times 10^{-3})$
3. ✘  $(0.15 \times 10^{-3}) / \pi$
4. ✘  $\pi / 0.15 \times 10^{-3}$

Question Number : 169 Question Id : 8946584177 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 insulation resistance of a cable of length 10 km is 1 MΩ. For a length 100 km of the same cable, the insulation resistance will be \_\_\_\_\_.

Options :

1. ✘ 1 MΩ
2. ✘ 10 MΩ
3. ✔ 0.1 MΩ
4. ✘ 0.01 MΩ

Question Number : 170 Question Id : 8946584178 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 three phase, 4 wire AC system, if the loads are balanced, then current in the neutral wire is \_\_\_\_\_.

Options :

1. ✘ 1 Amp
2. ✘ 2 Amps
3. ✘ 3 Amps
4. ✔ 0 Amp

Question Number : 171 Question Id : 8946584179 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 combined power and lighting load, the distribution system used is \_\_\_\_\_.

Options :

1. ✔ 3-phase, 4 wire
2. ✔ 1-phase, 2 wire
3. ✘ 3-phase, 3 wire
4. ✘ 2-phase, 2 wire

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 : 172 Question Id : 8946584180 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 an instrument transformer phase angle error occurs due to \_\_\_\_\_.

Options :

1.  secondary current not being  $180^0$  out of phase with the primary current
2.  actual transformation ratio is different from turns ratio
3.  secondary current is being  $180^0$  out of phase with primary current
4.  secondary current is being in phase with primary current

Question Number : 173 Question Id : 8946584181 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 typical active load is \_\_\_\_\_.

Options :

1.  blower
2.  lathe
3.  pump
4.  hoist

Question Number : 174 Question Id : 8946584182 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 True?

Options :

1.  in group drive initial cost is high
2.  at no load, d.c series motor can be started safely

3. ✓ in case of centrifugal pumps, torque varies as the square of the speed

4. ✗ starting torque of a shaded pole motor is very high

Question Number : 175 Question Id : 8946584183 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 locomotive with a mass of 50,000 kg on a track whose coefficient of adhesion is 20% will produce a tractive effort of (around) \_\_\_\_\_.

Options :

1. ✗ 25 KN

2. ✗ 1 KN

3. ✓ 100 KN

4. ✗ 250 KN

Question Number : 176 Question Id : 8946584184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Choose the correct statement from the following?

Options :

1. ✗ distance between stops divided by the actual time of run is called the scheduled speed

2. ✓ series parallel speed control is widely used in electric traction

3. ✗ meta-dyne converter output is constant current and constant voltage

4. ✗ battery electric drive is usually used for urban and sub-urban series

Question Number : 177 Question Id : 8946584185 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 specific energy output of a traction motor is 'X' watt-hour per tonne-km and the efficiency of gear is 0.5 and the efficiency of motor is also 0.5. The value of specific energy consumption is \_\_\_\_\_.

Options :

1. ✘ 2X
2. ✘ X
3. ✔ 4X
4. ✘ 8X

Question Number : 178 Question Id : 8946584186 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 characteristic of main line service in electric traction?

Options :

1. ✔ the operation involves over long distances within frequent stops
2. ✘ the operating speeds are low
3. ✘ accelerating and braking periods are relatively important
4. ✘ the distance between the stops is about 6 kms

Question Number : 179 Question Id : 8946584187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Electric braking through plugging without any additional corrective measure is possible for \_\_\_\_\_.

Options :

1. ✔ 3 -  $\Phi$  induction motor
2. ✘ 3 -  $\Phi$  Synchronous motor



3. ✘ d.c series motor

4. ✘ repulsion motor

Question Number : 180 Question Id : 8946584188 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 electric drive consists of \_\_\_\_\_

Options :

1. ✔ motor, transmitting shaft and control equipment

2. ✘ motor and load

3. ✘ motor, control equipment and load

4. ✘ motor, supply system and load

Question Number : 181 Question Id : 8946584189 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 commonly used AC motor is \_\_\_\_\_.

Options :

1. ✘ synchronous motor

2. ✘ slip ring induction motor

3. ✔ squirrel cage induction motor

4. ✘ AC commutator motor

Question Number : 182 Question Id : 8946584190 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 60 W lamp gives a luminous flux of 1500 lumen. Its efficiency is \_\_\_\_\_

Options :

1. ✘ 1500 lumen/watt

- 2. ✘ 250 lumen/watt
- 3. ✔ 25 lumen/watt
- 4. ✘ 2.5 lumen/watt

Question Number : 183 Question Id : 8946584191 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 size of wire for wiring a 15 Amps socket outlet in kitchen should be \_\_\_\_\_.

Options :

- 1. ✔ 4 mm<sup>2</sup> aluminum conductor single core
- 2. ✘ 6 mm<sup>2</sup> aluminum conductor single core
- 3. ✘ 1.5 mm<sup>2</sup> aluminum conductor single core
- 4. ✘ 8 mm<sup>2</sup> aluminum conductor single core

Question Number : 184 Question Id : 8946584192 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 size of continuous earth wire used with cables in domestic installation should not be less than \_\_\_\_\_ in any case.

Options :

- 1. ✘ 8 S. W. G
- 2. ✘ 6 S. W. G
- 3. ✘ 12 S. W. G
- 4. ✔ 14 S. W. G

Question Number : 185 Question Id : 8946584193 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 minimum clearance above ground of the lowest conductor of an overhead line for high voltage lines upto 11 KV erected along a street is \_\_\_\_\_.

Options :

1. ✘ 6.1 m
2. ✘ 5.2 m
3. ✔ 5.8 m
4. ✘ 4.0 m

Question Number : 186 Question Id : 8946584194 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 load on each power sub-circuit should be normally restricted to \_\_\_\_\_.

Options :

1. ✘ 800 watts
2. ✔ 3000 watts
3. ✘ 2000 watts
4. ✘ 1000 watts

Question Number : 187 Question Id : 8946584195 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 advantage of looping in system of wiring is \_\_\_\_\_.

Options :

1. ✘ tappings are taken directly from the mains
2. ✔ no tappings are taken directly from the mains
3. ✘ joint boxes are used

4. ✘ the length of wire required is more

Question Number : 188 Question Id : 8946584196 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 CRO by changing the time base, the following can be changed?

Options :

1. ✘ amplitude of saw tooth voltage
2. ✔ frequency of saw tooth voltage
3. ✘ gain of saw tooth voltage waveform
4. ✘ intensity of saw tooth voltage

Question Number : 189 Question Id : 8946584197 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 monostable multivibrator is also called \_\_\_\_\_

Options :

1. ✘ a flip-flop
2. ✘ a clock
3. ✔ one shot multivibrator
4. ✘ a free running multivibrator

Question Number : 190 Question Id : 8946584198 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 master-slave JK flip-flop is an example of \_\_\_\_\_.

Options :

1. ✘ level-triggered device

2. ✘ positive edge-triggered device
3. ✘ negative edge-triggered device
4. ✔ pulse-triggered device

Question Number : 191 Question Id : 8946584199 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-input XNOR gate gives HIGH output \_\_\_\_\_.

Options :

1. ✘ when one input is HIGH and other is LOW
2. ✘ only when both the inputs are LOW
3. ✔ when both the inputs are the same
4. ✘ only when both the inputs are HIGH

Question Number : 192 Question Id : 8946584200 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 loss versus device current characteristic of a Power MOSFET  
is best approximated by a/an \_\_\_\_\_.

Options :

1. ✔ parabola
2. ✘ straight line
3. ✘ rectangular hyperbola
4. ✘ experimentally decaying function

Question Number : 193 Question Id : 8946584201 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 step-up chopper is used to feed a load of 400 V d.c from a 250V d.c source. The induction current is continuous if the off time of the switch is  $20\mu\text{s}$ . The switching frequency of the chopper in KHz is \_\_\_\_\_.

Options :

1. ✓ 31.2 KHz
2. ✗ 50 KHz
3. ✗ 1 KHz
4. ✗ 314 KHz

Question Number : 194 Question Id : 8946584202 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 voltage wave form of a three phase square-wave inverter contains \_\_\_\_\_.

Options :

1. ✗ only even harmonics
2. ✗ both odd and even harmonics
3. ✓ any odd harmonics
4. ✗ only triple harmonics

Question Number : 195 Question Id : 8946584203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Microcontroller 8051 has \_\_\_\_\_ bits of the data bus.

Options :

1. ✗ 16
2. ✓ 8
3. ✗ 32



4. ✘ 64

Question Number : 196 Question Id : 8946584204 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 voltage source  $200 \sin(314t)$  is applied to a thyristor controlled half wave rectifier with resistive load of 50 ohms. If the firing angle is  $30^\circ$  with respect to supply voltage waveform, the average power in the load is \_\_\_\_\_

Options :

1. ✘ 90.6 Watts

2. ✘ 86.3 Watts

3. ✘ 60.8 Watts

4. ✔ 70.6 Watts

Question Number : 197 Question Id : 8946584205 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 phase AC regulator with an inductive load has the following details:  
source voltage = 230V, frequency = 50 Hz and  $\omega L = 5$  ohms. The control range of the firing angle ( $\alpha$ ) is \_\_\_\_\_.

Options :

1. ✘  $0 < \alpha < \pi$

2. ✔  $\pi/2 \leq \alpha \leq \pi$

3. ✘  $0 < \alpha < \pi/2$

4. ✘  $\pi > \alpha > \pi/2$

Question Number : 198 Question Id : 8946584206 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 bipolar junction transistor is operating in the saturation mode, which of the following statements is true about the state of its collector-base (CB) and the base-emitter (BE) junction?

Options :

1. ✘ the CB junction is forward biased and the BE junction is reverse biased
2. ✔ both CB and E junctions are forward biased
3. ✘ the CB junction is reverse biased and the BE junction is forward biased
4. ✘ the CB junction is reverse biased and the BE junction is reverse biased

Question Number : 199 Question Id : 8946584207 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 increasing order of speed of data access for the following device is:

- |                  |                         |
|------------------|-------------------------|
| i. Cache Memory  | ii. CD-ROM              |
| iii. Dynamic RAM | iv. Processor Registers |
| v. Magnetic Tape |                         |

Options :

1. ✘ (v), (ii), (iii), (iv), (i)
2. ✔ (v), (ii), (iii), (i), (iv)
3. ✘ (ii), (i), (iii), (iv), (v)
4. ✘ (v), (ii), (i), (iii), (iv)

Question Number : 200 Question Id : 8946584208 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 octal equivalent of the HEX number AB.CD is \_\_\_\_\_.

Options :

1. ✘ 253.314

2. ✔ 253.632

3. ✘ 526.314

4. ✘ 526.632