

# 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>	Mechanical Engineering 3rd Aug 2021 Shift2
<b>Subject Name :</b>	Mechanical Engineering
<b>Creation Date :</b>	2021-08-03 18:35:31
<b>Duration :</b>	180
<b>Total Marks :</b>	200
<b>Display Marks:</b>	No
<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>	Yes

## Mechanical Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	800894115
<b>Group Maximum Duration :</b>	0

<b>Group Minimum Duration :</b>	180
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	200
<b>Is this Group for Examiner? :</b>	No

## Mathematics

<b>Section Id :</b>	800894446
<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>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	800894512
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 1 Question Id : 80089422856 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

$$\text{If } \begin{pmatrix} x+y & z+y \\ z-y & x-2y \end{pmatrix} = \begin{pmatrix} 12 & 9 \\ -1 & -3 \end{pmatrix} \text{ then } \begin{pmatrix} x & y \\ z & 2z \end{pmatrix} =$$

**Options :**

1. ✘  $\begin{pmatrix} 5 & 7 \\ 4 & 8 \end{pmatrix}$

2. ✔  $\begin{pmatrix} 7 & 5 \\ 4 & 8 \end{pmatrix}$

3. ✘  $\begin{pmatrix} 6 & 7 \\ 3 & 6 \end{pmatrix}$

4. ✘  $\begin{pmatrix} 3 & 6 \\ 6 & 7 \end{pmatrix}$

Question Number : 2 Question Id : 80089422857 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{pmatrix} x & y & z \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$  and  $B = \begin{pmatrix} x & 2 & 3 \\ y & 5 & 6 \\ z & 8 & 9 \end{pmatrix}$  then

Options :

1. ✔  $\det(A - B) = \det A - \det B$

2. ✘  $\det A - \det B = 1$

3. ✘  $\det A + \det B = x + y + z$

4. ✘  $\det A = -\det B$

Question Number : 3 Question Id : 80089422858 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\text{If } \begin{pmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{pmatrix} = Ka^2b^2c^2 \text{ then } K =$$

Options :

1. ✓ 4

2. ✗ 6

3. ✗ 8

4. ✗ 2

Question Number : 4 Question Id : 80089422859 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If the system of equations  $x + 2y - 3z = 0$ ,  $3x - 2y + z = 0$ ,  $kx - 14y + 15z = 0$  has nonzero solutions, then  $k^2 - 2k - 3 =$

Options :

1. ✓ 12

2. ✗ 18

3. ✗ 5

4. ✗ 0

Question Number : 5 Question Id : 80089422860 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The partial fractions of  $\frac{x^2+5x+10}{x+2} - \frac{2+6x+x^2}{x+3} =$

Options :

1. ✓  $\frac{4}{x+2} + \frac{7}{x+3}$

2. ✗  $\frac{4}{x+2} - \frac{7}{x+3}$

3. ✗  $\frac{7}{x+2} - \frac{4}{x+3}$

4. ✗  $\frac{4}{x+3} + \frac{7}{x+2}$

Question Number : 6 Question Id : 80089422861 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If  $4^{\log_9 3} + 9^{\log_2 4} = 5^{\log_x 83}$ , then

Options :

1. ✗  $x^3 + 4x^2 - 4x - 5 = 0$

2. ✗  $x^3 - 4x^2 - 4x + 5 = 0$

3. ✘  $x^3 - 4x^2 + 4x - 5 = 0$

4. ✔  $x^3 - 4x^2 - 4x - 5 = 0$

Question Number : 7 Question Id : 80089422862 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\log_e x + \log_e(1+x) = 0 \Rightarrow x =$$

Options :

1. ✘  $\frac{-1-\sqrt{5}}{2}$

2. ✘ 1

3. ✔  $\frac{-1+\sqrt{5}}{2}$

4. ✘ -2

Question Number : 8 Question Id : 80089422863 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\text{If } \alpha + \beta = \frac{\pi}{2} \text{ and } \beta + \gamma = \alpha, \text{ then } \tan \alpha =$$

Options :

1. ✘  $2(\tan \beta + \tan \gamma)$

2. ✘  $\tan \beta + \tan \gamma$

3. ✘  $2 \tan \beta + \tan \gamma$

4. ✔  $\tan \beta + 2 \tan \gamma$

Question Number : 9 Question Id : 80089422864 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a triangle ABC ,  $a^2 \cos 2B + b^2 \cos 2A + 2ab \cos(A - B) =$

Options :

1. ✘  $a^2$

2. ✘  $b^2$

3. ✔  $c^2$

4. ✘  $(a+b+c)^2$

Question Number : 10 Question Id : 80089422865 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$f(x) = \sin^{-1}x + \cos^{-1}x + \tan^{-1}\frac{1}{x} + \tan^{-1}x$  then the area (in square units) bounded by  $y = f(x)$ , y-axis

and the line  $2y = \pi(x+1)$  is

Options :

1. ✔  $\frac{\pi}{4}$

2. ✘  $\frac{\pi}{2}$

3. ✘  $\frac{\pi}{3}$

4. ✘  $\pi$

Question Number : 11 Question Id : 80089422866 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

$$\left(\frac{1+i}{\sqrt{2}}\right)^8 + \left(\frac{1-i}{\sqrt{2}}\right)^8 =$$

Options :

1. ✘ 16

2. ✘ 8

3. ✘ 4

4. ✔ 2

Question Number : 12 Question Id : 80089422867 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The maximum value of  $|z|$  satisfying the equation  $\frac{1}{12}(z + \bar{z})^2 = 1 - \frac{1}{3}|z|^2$  is

Options :

1. ✘  $\sqrt{2}$



2. ✓  $\sqrt{3}$

3. ✗ 4

4. ✗ 6

Question Number : 13 Question Id : 80089422868 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $n$  is a positive integer, then  $(-i)^{4n+3} =$

Options :

1. ✗  $2i$

2. ✗  $-i$

3. ✓  $i$

4. ✗  $4i$

Question Number : 14 Question Id : 80089422869 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation of the line passing through the point  $(4, 0)$  and having intercepts in the ratio is  $a : b$  is

Options :

1. ✗  $bx + ay = a$

2. ✓  $bx + ay = 4b$

3. ✗  $bx + ay = b$

4. ✗  $bx + ay = 4a$

Question Number : 15 Question Id : 80089422870 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $L_1, L_2$  are the angular bisectors of the acute and obtuse angles between the lines  $x-y+2=0$  and  $7x+y+1=0$  then angle between  $L_1$  and  $L_2$  is

Options :

1. ✗  $\pi$

2. ✗  $\frac{\pi}{3}$

3. ✗  $\frac{\pi}{6}$

4. ✓  $\frac{\pi}{2}$

Question Number : 16 Question Id : 80089422871 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation of the line parallel to the line  $x-2y+5=0$  and passing through the point P(3,5) is

Options :

1. ✘  $x - 2y + 15 = 0$

2. ✘  $x - 2y + 6 = 0$

3. ✘  $x - 2y + 8 = 0$

4. ✔  $x - 2y + 7 = 0$

**Question Number : 17 Question Id : 80089422872 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The equation of the circle which touches the coordinate axes is

**Options :**

1. ✘  $x^2 + y^2 + 2gx + 2fy + c = 0$

2. ✘  $x^2 + y^2 + 2ax + 2ay + a^2 = 0$

3. ✘  $x^2 + y^2 \pm 2gx \pm 2fy + c = 0$

4. ✔  $x^2 + y^2 \pm 2ax \pm 2ay + a^2 = 0$

**Question Number : 18 Question Id : 80089422873 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

If  $\alpha, \beta (\alpha > \beta)$  are roots of the quadratic equation  $4x^2 - 4x - 3 = 0$ , then the equation of the circle with center

$\left(\frac{\alpha}{\beta} + \frac{\beta}{\alpha}, \frac{\alpha}{\beta} - \frac{\beta}{\alpha}\right)$  and radius  $\alpha^2 - \beta^2$  is

**Options :**

1. ✓  $9x^2 + 9y^2 + 60x + 48y + 128 = 0$

2. ✗  $9x^2 + 9y^2 + 60x - 48y - 128 = 0$

3. ✗  $9x^2 + 9y^2 - 60x - 48y + 128 = 0$

4. ✗  $9x^2 + 9y^2 - 60x + 48y - 128 = 0$

**Question Number : 19 Question Id : 80089422874 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The equation of the tangent to the circle  $x^2 + y^2 = 25$  at the point  $P(3,4)$  is

**Options :**

1. ✗  $4x + 3y - 25 = 0$

2. ✗  $4x + 3y + 25 = 0$

3. ✓  $3x + 4y - 25 = 0$

4. ✗  $3x + 4y - 5 = 0$

**Question Number : 20 Question Id : 80089422875 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

For  $x^2 - 9 \neq 0$ , if  $y = \log \left( e^{x/2} \left( \frac{x-3}{x+3} \right)^{4/5} \right)$ , then  $\frac{dy}{dx}$  at  $x = 1$  is equal to

Options :

1. ✘  $\frac{7}{10}$

2. ✘  $\frac{2}{5}$

3. ✔  $\frac{-1}{10}$

4. ✘  $\frac{-1}{5}$

Question Number : 21 Question Id : 80089422876 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For  $f(x) = |x^2 - 3x + 2|$ , then sum of the values of  $\frac{df}{dx}$  at  $x = 1.5$  and at  $x = 2.5$  is

Options :

1. ✔ 2

2. ✘ 6

3. ✘ 4

4. ✘ 8

Question Number : 22 Question Id : 80089422877 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\frac{d^2}{dx^2} \left( \frac{1}{5x+3} \right) =$$

Options :

1. ✘  $\frac{25}{(5x+3)^3}$

2. ✔  $\frac{50}{(5x+3)^3}$

3. ✘  $\frac{125}{(5x+3)^3}$

4. ✘  $\frac{100}{(5x+3)^3}$

Question Number : 23 Question Id : 80089422878 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The curve represented by  $x = t^5 - 5t^3 - 20t + 7, y = 4t^3 - 3t^2 - 18t + 3$  is increasing for all  $t$  in the interval

Options :

1. ✘  $(-2, 2)$

2. ✔  $\left(-1, \frac{3}{2}\right)$

3. ✘  $\left(\frac{3}{2}, 2\right)$

4. ✘ (-1,2)

Question Number : 24 Question Id : 80089422879 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The equation of tangent to the curve  $y^2 = 4x + 5$  at P(-1,1) is

Options :

1. ✘  $2x - y + 9 = 0$

2. ✘  $2x + y - 7 = 0$

3. ✔  $2x - y + 3 = 0$

4. ✘  $x + 2y + 9 = 0$

Question Number : 25 Question Id : 80089422880 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If at  $X = a$ , the maximum value of  $(X^5)(16 - X)^{11}$  is K. Then  $\frac{K}{a} =$

Options :

1. ✔  $11^{11}5^4$

2. ✘  $6^4 10^{11}$

3. ✘  $11^4 5^{11}$

4. ✘  $10^4 6^{11}$

Question Number : 26 Question Id : 80089422881 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $u(x, y) = \text{Sin}^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$  then  $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$

Options :

1. ✘  $\frac{1}{8} \tan u$

2. ✔  $\frac{1}{2} \tan u$

3. ✘  $\frac{1}{4} \tan u$

4. ✘  $\frac{1}{3} \tan u$

Question Number : 27 Question Id : 80089422882 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $\int \frac{2x^{18}+7x^{13}}{(x^7+x^5+1)^3} dx = \frac{x^p}{m(x^7+x^5+1)^n} + c$ , then  $2p - (m+n)^2 =$

Options :

1. ✘ 0



2. ✘ 3

3. ✔ 12

4. ✘ 20

**Question Number : 28 Question Id : 80089422883 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

If  $\int \frac{\sin 2x}{\sin 5x \sin 3x} dx = A \log \sin 3x + B \log \sin 5x + C$ , then  $A + B =$

**Options :**

1. ✘ 2/7

2. ✘ 1/3

3. ✘ -2/5

4. ✔ 2/15

**Question Number : 29 Question Id : 80089422884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

$\int \frac{1}{9x^2 - 4} dx =$

**Options :**

1. ✘

$$\frac{1}{3} \log \left| \frac{3x-2}{3x+2} \right|$$

2. ✘  $\frac{1}{12} \log \left| \frac{x-2}{x+2} \right|$

3. ✔  $\frac{1}{12} \log \left| \frac{3x-2}{3x+2} \right|$

4. ✘  $\frac{1}{2} \log \left| \frac{3x-2}{3x+2} \right|$

Question Number : 30 Question Id : 80089422885 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $I_1 = \int_0^1 a^x dx$ ,  $I_2 = \int_0^1 a^{x^2} dx$  and  $I_3 = \int_0^1 a^{x^3} dx$  then

Options :

1. ✔  $I_1 > I_2 > I_3$  when  $a > 1$

2. ✘  $I_1 < I_2 < I_3$ , when  $a > 1$

3. ✘  $I_1 > I_2 > I_3$ , when  $0 < a < 1$

4. ✘  $I_1 < I_2 < I_3$  for any  $a > 0$

Question Number : 31 Question Id : 80089422886 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The area (in square units) bounded by the curve  $x^2 = 4y$ , the x-axis and the line  $x = 2$  is

Options :

1. ✘  $\frac{1}{3}$

2. ✔  $\frac{2}{3}$

3. ✘  $\frac{5}{3}$

4. ✘  $\frac{7}{3}$

Question Number : 32 Question Id : 80089422887 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\lim_{n \rightarrow \infty} \left( \frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} + \dots + \frac{1}{2n} \right) =$$

Options :

1. ✘ 0

2. ✘  $\frac{1}{2}$

3. ✘  $e^2$

4. ✔  $\log 2$

Question Number : 33 Question Id : 80089422888 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Using Trapezoidal rule with  $h = \frac{1}{2}$ , the value of the integral  $\int_0^1 \frac{1}{3+2x} dx =$

Options :

1. ✘  $\frac{11}{120}$

2. ✘  $\frac{21}{120}$

3. ✔  $\frac{31}{120}$

4. ✘  $\frac{41}{120}$

Question Number : 34 Question Id : 80089422889 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The differential equation representing the family of curves  $y^2 = 2c(x + \sqrt{c})$  ( $c$  is a positive arbitrary Constant) is of

Options :

1. ✘ degree 1

2. ✘ order 2

3. ✓ degree 3

4. ✘ degree 2

Question Number : 35 Question Id : 80089422890 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The general solution of  $\frac{dy}{dx} = \frac{x^2+4x-9}{x+2}$  is

Options :

1. ✓  $y = \frac{(x+2)^2}{2} - 13 \log|x+2| + c$

2. ✘  $y = (x+2)^2 - 5 \log|x+2| + c$

3. ✘  $y = \frac{x^2}{2} + 2x + 13 \log|x+2| + c$

4. ✘  $y = \frac{x^2}{2} + 2x - 5 \log|x+2| + c$

Question Number : 36 Question Id : 80089422891 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation  $x \frac{dy}{dx} = xe^{-\frac{y}{x}} + y$  is

Options :

1. ✘

$$e^{\frac{x}{y}} = \log |cx|$$

2. ✓  $e^{\frac{y}{x}} = \log |cx|$

3. ✗  $e^{\frac{x^2}{y}} = \log |cx|$

4. ✗  $e^{\frac{x}{y^2}} = \log |cx|$

Question Number : 37 Question Id : 80089422892 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$\frac{dy}{dx} = \frac{f(x,y)}{g(x,y)}$  is a homogeneous differential equation. The substitution  $y = Vx$  ( $V$  is a function of  $x$ ) reduces the

given differential equation to  $\frac{dV}{dx} = \frac{1}{x}G(V)$ . Then  $G(V) =$

Options :

1. ✓  $\frac{f(1,V)}{g(1,V)} - V$

2. ✗  $\frac{f(V)}{g(V)} - V$

3. ✗  $\frac{f(1,V)}{g(1,V)} + V$

4. ✗  $\frac{f(V)}{g(V)} + V$

Question Number : 38 Question Id : 80089422893 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation  $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = e^{-x}\sin x$  is

Options :

1. ✘  $y = e^{-x}(A + Bx) + \frac{e^{-x}\sin x}{5}$

2. ✔  $y = e^{-x}(A + Bx - \sin x)$

3. ✘  $y = e^{-x}(A + Bx) + \frac{e^{-x}\cos x}{5}$

4. ✘  $y = e^{-x}(A + B\log x) + \frac{e^{-x}\sin x}{5}$

Question Number : 39 Question Id : 80089422894 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The particular integral of the differential equation  $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$  is

Options :

1. ✔  $-e^x(x \sin x + 2 \cos x)$

2. ✘  $-e^x(x \cos x + 2 \sin x)$

3. ✘  $e^x(x \sin x - 2 \cos x)$

4. ✘  $e^x(x \cos x - 2 \sin x)$

Question Number : 40 Question Id : 80089422895 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $L\{t^2 e^{-2t}\} = f(s)$ , then  $f(4) =$

Options :

1. ✘  $\frac{1}{54}$

2. ✘  $\frac{1}{27}$

3. ✔  $\frac{1}{108}$

4. ✘  $\frac{1}{216}$

Question Number : 41 Question Id : 80089422896 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $L[f(t)] = \frac{9s^2 - 12s + 15}{(s-1)^3}$ , then  $L\left[f\left(\frac{t}{3}\right)\right] =$

Options :

1. ✔  $9 \left[ \frac{27s^2 - 36s + 5}{(3s-1)^3} \right]$

2. ✘  $9 \left[ \frac{s^2 - 4s + 15}{(s-3)^3} \right]$

3. ✘  $3 \left[ \frac{27s^2 - 12s + 5}{(3s-1)^3} \right]$



4. ✘  $27 \left[ \frac{s^2 - 4s + 15}{(s-3)^2} \right]$

Question Number : 42 Question Id : 80089422897 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
 Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\infty} \frac{e^{-5t} - e^{-8t}}{t} dt =$$

Options :

1. ✘  $\log\left(\frac{4}{5}\right)$

2. ✘  $\log\left(\frac{2}{5}\right)$

3. ✔  $\log\left(\frac{8}{5}\right)$

4. ✘  $\log\left(\frac{7}{5}\right)$

Question Number : 43 Question Id : 80089422898 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
 Correct Marks : 1 Wrong Marks : 0

If  $F_a(s) = \mathcal{L}(\sin at)$  then,  $\mathcal{L}\left(\frac{e^{-3t} \sin 2t}{t}\right) =$

Options :

1. ✘  $\int_s^{\infty} F_2(s) ds$

2. ✔  $\int_s^{\infty} F_2(s + 3) ds$

3. ✘  $\int_s^{\infty} \frac{d}{ds} (F_2(s)) ds$

4. ✘  $-\int_s^{\infty} \frac{d}{ds} (F_2(s - 3)) ds$

Question Number : 44 Question Id : 80089422899 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$L^{-1} \left\{ \frac{6s}{s^2 + 2s - 8} \right\}$$

Options :

1. ✘  $4e^{-4t} + 2e^{-2t}$

2. ✘  $4e^{4t} + 2e^{-2t}$

3. ✘  $4e^{4t} + 2e^{2t}$

4. ✔  $4e^{-4t} + 2e^{2t}$

Question Number : 45 Question Id : 80089422900 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

**Correct Marks : 1 Wrong Marks : 0**

If  $L(f(t)) = F(s)$ ,  $L(g(t)) = G(s)$ , then  $L^{-1}(F(s) G(s)) =$

**Options :**

1. ✓  $\int_0^t f(p)g(t-p) dp$

2. ✗  $\int_0^t f(t)g(t) dt$

3. ✗  $\int_0^t f(t)g(t-p) dp$

4. ✗  $\int_0^t f(tp)g(t/p) dt$

**Question Number : 46 Question Id : 80089422901 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

If  $y = y(t)$  satisfies the differential equation  $\frac{d^2y}{dt^2} - 2\frac{dy}{dt} + y = e^t$  together with the conditions  $y(0) = 2, \frac{dy}{dt} = -1$  at  $t = 0$ , then  $y(t) =$

**Options :**

1. ✗  $e^t \left( 2 + 3t + \frac{1}{2}t^2 \right)$

2. ✓  $e^t \left( 2 - 3t + \frac{1}{2}t^2 \right)$

3. ✗  $e^t \left( 2 - 3t - \frac{1}{2}t^2 \right)$

4. ✗  $e^t \left( 2 + 3t - \frac{1}{2}t^2 \right)$

Question Number : 47 Question Id : 80089422902 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{2\pi} \cos^2(5x) dx =$$

Options :

1. ✓  $\pi$

2. ✗  $2\pi$

3. ✗  $4\pi$

4. ✗  $5\pi$

Question Number : 48 Question Id : 80089422903 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Fourier series of  $x-x^2$  in the interval  $(-\pi, \pi)$  contains

Options :

1. ✗ only sine terms

2. ✗ only cosine terms

3. ✓ both sine and cosine terms

negative integral powers of x, but not trigonometric functions

4. ✘

Question Number : 49 Question Id : 80089422904 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $f(x) = x^3$  when  $0 \leq x \leq 4$ ,  $f(x+4) = f(x)$ ,  $\forall x$  and its Fourier series is  $f(x) = \sum_{n=0}^{\infty} (a_n \cos \frac{n\pi x}{2} + b_n \sin \frac{n\pi x}{2})$ ,  
then  $b_1 =$

Options :

1. ✘  $\frac{128}{\pi^2} + \frac{192}{\pi^4}$

2. ✘  $\frac{128}{\pi^2}$

3. ✘  $\frac{192}{\pi^2} + \frac{192}{\pi^4}$

4. ✔  $\frac{96}{\pi^2} - \frac{128}{\pi}$

Question Number : 50 Question Id : 80089422905 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

If  $f(x) = \begin{cases} 0, & -2 \leq x < 0 \\ 1, & 0 \leq x < 2 \end{cases}$ ,  $f(x+4) = f(x)$   $\forall x$  and  $f(x) = \sum_{n=0}^{\infty} (a_n \cos \frac{n\pi x}{2} + b_n \sin \frac{n\pi x}{2})$ , then  $b_2 =$

Options :

1. ✘  $\frac{2}{\pi}$

2. ✘  $\frac{4}{\pi}$

3. ✘  $\frac{3}{\pi}$

4. ✔ 0

## Physics

Section Id :	800894447
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	800894513
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 80089422906 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The Dimensional formula of potential energy is

Options :

1. ✘  $MLT^{-2}$

2. ✔  $ML^2T^{-2}$

3. ✘  $ML^2T^{-1}$

4. ✘  $MLT^{-1}$

**Question Number : 52 Question Id : 80089422907 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In case of a superconductor one among the following statement is incorrect

**Options :**

1. ✘ The resistivity drops suddenly at transition temperature

2. ✔ It is paramagnetic below it's transition temperature

3. ✘ Specific heat discontinuity occurs at transition temperature

4. ✘ It will become diamagnetic below it's transition temperature

**Question Number : 53 Question Id : 80089422908 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements is true regarding super conductors?

**Options :**

1. ✘ super conductors have high resistance at very low temperatures, and they are perfectly diamagnetic

2. ✘ super conductors have high resistance at very low temperatures, and they are perfectly ferro magnetic
3. ✘ super conductors have zero resistance at very low temperatures, and they are perfectly para magnetic
4. ✔ super conductors have zero resistance at very low temperatures, and they are perfectly dia magnetic

**Question Number : 54 Question Id : 80089422909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

If the temperature remains constant the volume of the gas will

**Options :**

1. ✔ Increase with decrease in pressure
2. ✘ Decrease with decrease in pressure
3. ✘ Not change with change in pressure
4. ✘ Increase with increase in pressure

**Question Number : 55 Question Id : 80089422910 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A gas at a pressure of  $150 \text{ Nm}^{-2}$  is compressed to half its original volume. If the expansion is isothermal, the final pressure will be

**Options :**

1. ✘



100 Nm<sup>-2</sup>

2. ✘ 150 Nm<sup>-2</sup>

3. ✘ 200 Nm<sup>-2</sup>

4. ✔ 300 Nm<sup>-2</sup>

**Question Number : 56 Question Id : 80089422911 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The first law of thermodynamics is the law of

**Options :**

1. ✘ Conservation of mass

2. ✘ Conservation of momentum

3. ✔ Conservation of energy

4. ✘ Conservation of temperature

**Question Number : 57 Question Id : 80089422912 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Two equal vectors have a resultant equal to either. The angle between them will be

**Options :**

1. ✘ 30°

2. ✘  $90^\circ$

3. ✔  $120^\circ$

4. ✘  $180^\circ$

**Question Number : 58 Question Id : 80089422913 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The vectors  $\vec{A}$  and  $\vec{B}$  are such that if  $|\vec{A} + \vec{B}| = |\vec{A} - \vec{B}|$  then the angle between  $\vec{A}$  and  $\vec{B}$  will be

**Options :**

1. ✔  $90^\circ$

2. ✘  $0^\circ$

3. ✘  $180^\circ$

4. ✘  $\cos\theta$

**Question Number : 59 Question Id : 80089422914 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The value of  $\lambda$  for which the two vectors:

$3\hat{i} - \hat{j} + \hat{k}$  and  $2\hat{i} + \lambda\hat{j} + 2\hat{k}$  are perpendicular is

**Options :**

1. ✘ -8

2. ✔ 8

3. ✘ 4

4. ✘ 2

**Question Number : 60 Question Id : 80089422915 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In case of an oblique projection, which statement is true with regard to its velocity components?

**Options :**

1. ✘ Vertical and horizontal components change

2. ✘ Vertical and horizontal components do not change

3. ✔ Vertical component changes but horizontal component remains constant

4. ✘ Vertical component remains constant but horizontal component changes

**Question Number : 61 Question Id : 80089422916 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

An insect can jump a maximum horizontal distance of 20 cm. If it spends negligible time on the ground,

with what speed can it travel along the road.

**Options :**

1. ✘ 0.1 m/s

2. ✔ 1.0 m/s

3. ✘ 0.14 m/s

4. ✘ 1.4 m/s

**Question Number : 62 Question Id : 80089422917 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A person holds a book weighing 1 kg between his hands and keeps it from falling by pressing his hands together. If the minimum force exerted by each hand horizontally is 49 N, what will be the coefficient of friction between the book and his hands

**Options :**

1. ✘ 1

2. ✘ 10

3. ✔ 0.1

4. ✘ 0.01

**Question Number : 63 Question Id : 80089422918 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A ball rolled on ice with a velocity of  $8 \text{ ms}^{-1}$  comes to rest after travelling 40 m. If the value of  $g = 9.8 \text{ ms}^{-2}$ , the coefficient of friction is

**Options :**

1. ✘ 0.328
2. ✔ 0.0816
3. ✘ 0.0416
4. ✘ 0.258

**Question Number : 64 Question Id : 80089422919 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which one of the following is not the unit of energy?

**Options :**

1. ✔ Kilowatt
2. ✘ Kilowatt hour
3. ✘ Joule
4. ✘ Newton meter

**Question Number : 65 Question Id : 80089422920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The principle of conservation of energy states that

**Options :**

1. ✓ Sum of all types of energies is conserved
2. ✘ Total mechanical energy is conserved
3. ✘ Total kinetic energy is conserved
4. ✘ Total potential energy is conserved

**Question Number : 66 Question Id : 80089422921 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

For a body moving with simple harmonic motion, the number of cycles per second, is known as its

**Options :**

1. ✘ Oscillation
2. ✘ Amplitude
3. ✘ Periodic time
4. ✓ Frequency

**Question Number : 67 Question Id : 80089422922 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The acceleration of particle executing S.H.M. when it is at mean position is

**Options :**

1. ✘ Infinite
2. ✔ Zero
3. ✘ Maximum
4. ✘ Unity

**Question Number : 68 Question Id : 80089422923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

If the length of a simple pendulum executing simple harmonic motion is increased by 69% then the percentage increases in the time period of the simple pendulum of increased length will be

**Options :**

1. ✔ 30 %
2. ✘ 330 %
3. ✘ 3.0 %
4. ✘ 33 %

**Question Number : 69 Question Id : 80089422924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The longitudinal waves can not

**Options :**

1. ✘ Have a unique wave velocity
2. ✔ Be polarized
3. ✘ Have a unique wavelength
4. ✘ Transmit energy

**Question Number : 70 Question Id : 80089422925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A cinema hall has a volume of  $2800 \text{ m}^3$  and total surface absorption is 225 O.W.U. The reverberation time will be

**Options :**

1. ✘ 1.90 s
2. ✔ 1.99 s
3. ✘ 2.25 s
4. ✘ 2.40 s

**Question Number : 71 Question Id : 80089422926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Stress is



**Options :**

1. ✘ External force
2. ✔ Internal resistive force
3. ✘ Axial force
4. ✘ Radial force

**Question Number : 72 Question Id : 80089422927 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Which of the following statements is false?

**Options :**

1. ✔ Viscosity is independent of the surface area of liquid layers in contact
2. ✘ Viscosity of a fluid changes with temperature
3. ✘ The dimensions of viscosity is same as that of the product of pressure and time
4. ✘ The viscous force is directed opposite to the direction of motion of liquid.

**Question Number : 73 Question Id : 80089422928 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A wire having uniform diameter ( $d$ ) and length ( $l$ ) has a resistance  $R$ . Another wire having same material but having diameter  $2d$  and length  $4l$ , then its resistance will be

**Options :**

1. ✓  $R$

2. ✗  $R/2$

3. ✗  $R/4$

4. ✗  $2R$

**Question Number : 74 Question Id : 80089422929 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a meter bridge experiment, the ratio of the left gap resistance to right gap resistance is 2:3. The balance point from left is

**Options :**

1. ✓ 40 cm

2. ✗ 45 cm

3. ✗ 60 cm

4. ✗ 65 cm

**Question Number : 75 Question Id : 80089422930 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A magnet when placed at right angles to the earth's horizontal magnetic induction  $2 \times 10^{-5} \text{ Wb/m}^2$  experiences a couple of  $2 \times 10^{-5} \text{ Nm}$ . Then, the magnetic moment of magnet is

**Options :**

1. ✓  $1 \text{ Am}^2$
2. ✗  $1.5 \text{ Am}^2$
3. ✗  $5 \text{ Am}^2$
4. ✗  $7.5 \text{ Am}^2$

## Chemistry

Section Id :	800894448
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	800894514
Question Shuffling Allowed :	Yes

**Question Number : 76 Question Id : 80089422931 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

When an electron drops from 4s orbital to 2s orbital in an hydrogen atom, the frequency of radiation emitted belong to which region (Rydberg constant =  $1.097 \times 10^7 \text{ m}^{-1}$ )

**Options :**

1. ✘ Ultraviolet region
2. ✔ Visible region
3. ✘ Infrared region
4. ✘ Microwave region

**Question Number : 77 Question Id : 80089422932 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is true about ionic compounds?

**Options :**

1. ✘ Ionic compounds conduct electricity when dissolved in water
2. ✘ Ionic compounds are not soluble in water.
3. ✘ Ionic compounds are crystalline solids.
4. ✔ Ionic compounds conduct electricity when dissolved in water & Ionic compounds are crystalline solids.

**Question Number : 78 Question Id : 80089422933 Question Type : MCQ Option Shuffling : Yes**

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Oxidation state of Fe in  $\text{Fe}_3\text{O}_4$  is

Options :

1. ✓  $\frac{8}{3}$

2. ✗  $\frac{3}{8}$

3. ✗  $\frac{3}{2}$

4. ✗  $-\frac{3}{8}$

Question Number : 79 Question Id : 80089422934 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a sample of salt water, NaCl would be considered as?

Options :

1. ✗ Solution

2. ✓ Solute

3. ✗ Solvent

4. ✗ Solvation

Question Number : 80 Question Id : 80089422935 Question Type : MCQ Option Shuffling : Yes

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

30 mL of 0.1 M Mohr's salt solution is titrated in acid medium against 0.1M  $K_2Cr_2O_7$  solution taken in the burette. The volume of  $K_2Cr_2O_7$  solution required at the end point after the addition of suitable indicator is

**Options :**

1. ✘ 30 mL

2. ✔ 5 mL

3. ✘ 10 mL

4. ✘ 15 mL

**Question Number : 81 Question Id : 80089422936 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

What volume of 12.6 M HCl must be added to enough water to prepare 5.00 liters of 3.00M HCl?

**Options :**

1. ✘ 21.0 L

2. ✘ 0.840 L

3. ✔ 1.19 L

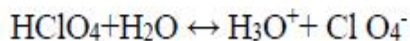
4. ✘ 7.56 L

Question Number : 82 Question Id : 80089422937 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Choose the correct statement from given options below for the equilibrium reaction



Options :

1. ✘  $\text{HClO}_4$  is the conjugate acid of  $\text{H}_2\text{O}$
2. ✘  $\text{H}_3\text{O}^+$  is the conjugate base of  $\text{H}_2\text{O}$
3. ✘  $\text{H}_2\text{O}$  is the conjugate acid of  $\text{H}_3\text{O}^+$
4. ✔  $\text{ClO}_4^-$  is the conjugate base of  $\text{HClO}_4$

Question Number : 83 Question Id : 80089422938 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Three unknown solutions are given with pH value of 6, 8 & 9.5 respectively. Which solution will contain the maximum  $\text{OH}^-$  ion?

Options :

1. ✘ Solution sample-1
2. ✘ Solution sample-2
3. ✔ Solution sample-3
4. ✘ Data are insufficient

Question Number : 84 Question Id : 80089422939 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

An example of acidic buffer solution is a mixture of

Options :

1. ✘  $\text{NH}_4\text{OH}, \text{NH}_4\text{Cl}$
2. ✘  $\text{HCl}, \text{NaCl}$
3. ✘  $\text{CH}_3\text{COOH}, \text{NH}_4\text{OH}$
4. ✔  $\text{CH}_3\text{COOH}, \text{CH}_3\text{COONa}$

Question Number : 85 Question Id : 80089422940 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

A mineral is called an ore if?

Options :

1. ✘ Metal present in mineral is precious
2. ✔ Metal can be extracted profitably from mineral
3. ✘ Metal cannot be extracted
4. ✘ metal has good malleability



Question Number : 86 Question Id : 80089422941 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Concentration of sulphide ore will be done by

Options :

1. ✓ Froath floatation

2. ✗ Roasting

3. ✗ Sedimentation

4. ✗ Smelting

Question Number : 87 Question Id : 80089422942 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

One of the following will be occurred at the anode, during the electrolysis of fused NaCl.

Options :

1. ✗  $\text{Na}^-$  gets reduced

2. ✓  $\text{Cl}^-$  gets oxidized

3. ✗  $\text{Na}^-$  gets oxidized

4. ✗  $\text{Na}^+$  gets oxidized

Question Number : 88 Question Id : 80089422943 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Electrolysis of dilute aqueous NaCl solution was carried out by passing 10 milliamperes current. The time required to liberate 0.01 mol of  $H_2$  gas at the cathode is?

Options :

1. ✘  $9.65 \times 10^4$  s

2. ✘  $28.95 \times 10^4$  s

3. ✔  $19.3 \times 10^4$  s

4. ✘  $38.6 \times 10^4$  s

Question Number : 89 Question Id : 80089422944 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Standard reduction potential value of saturated calomel electrode is

Options :

1. ✘ + 0.268

2. ✘ + 0.6994

3. ✘ + 0.0242

4. ✔ + 0.2415

**Question Number : 90 Question Id : 80089422945 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In the protection of Iron structure by sacrificial anode method , the metal used as anode

**Options :**

1. ✘ Silver
2. ✘ Zinc
3. ✔ Magnesium
4. ✘ Lead

**Question Number : 91 Question Id : 80089422946 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In electrolytic conductors, the conductance is due to

**Options :**

1. ✘ Free movement of electrons
2. ✘ Restricted movement of electrons
3. ✘ Restricted movement of ions
4. ✔ Free movement of ions

**Question Number : 92 Question Id : 80089422947 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Choose the incorrect statement from the following options.

**Options :**

1. ✘ In hard water, the detergent values of soap are decreased
2. ✔ In the presence of dissolved hardness producing salts, the boiling point of water is decreased
3. ✘ The water which does not form lather with soap is called hard water
4. ✘ The hard water consists of calcium and magnesium salts in dissolved state

**Question Number : 93 Question Id : 80089422948 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In high pressure boilers, scale formation can be avoided by adding

**Options :**

1. ✘  $\text{Na}_2\text{CO}_3$
2. ✔ Sodium phosphate
3. ✘  $\text{NaOH}$
4. ✘ Sodium meta Aluminate

**Question Number : 94 Question Id : 80089422949 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The basis of reverse osmosis is

**Options :**

1. ✘ Osmotic pressure is greater than the hydrostatic pressure
2. ✘ Osmotic pressure is equal to the hydrostatic pressure
3. ✔ Hydrostatic pressure is greater than the osmotic pressure
4. ✘ Osmotic pressure does not exist

**Question Number : 95 Question Id : 80089422950 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A thermoplastic is formed by the phenomenon of

**Options :**

1. ✔ Chain polymerization
2. ✘ Condensation polymerization
3. ✘ Chlorination
4. ✘ Nitration

**Question Number : 96 Question Id : 80089422951 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Natural rubber is a polymer of?

**Options :**

1. ✘ 1, 1-Dimethylbutadiene
2. ✔ 2-Methyl-1, 3-butadiene
3. ✘ 2-Chlorobuta-1,3-diene
4. ✘ 2-Chlorobut-2-ene

**Question Number : 97 Question Id : 80089422952 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Identify the correct statement from the following

**Options :**

1. ✘ A good fuel should undergo spontaneous combustion
2. ✘ A good fuel should have high moisture content
3. ✔ A good fuel should have high calorific value
4. ✘ A good fuel should have high content of non-combustible matter

**Question Number : 98 Question Id : 80089422953 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Laboratory gas is obtained by cracking

**Options :**

1. ✘ Coal
2. ✘ Diesel oil
3. ✘ Petrol
4. ✔ Kerosene oil

**Question Number : 99 Question Id : 80089422954 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In sewage when the concentration of decomposable organic matter is large, then

**Options :**

1. ✔ BOD value is high
2. ✔ COD value is high
3. ✘ BOD value is low
4. ✘ COD value is low

**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 : 100 Question Id : 80089422955 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**



From the following options given below, what is the major non-renewable energy usage in India ?

**Options :**

1. ✓ Coal

2. ✗ Petroleum and other liquids

3. ✗ Natural gas

4. ✗ Nuclear

## Mechanical Engineering

<b>Section Id :</b>	800894449
<b>Section Number :</b>	4
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	100
<b>Number of Questions to be attempted :</b>	100
<b>Section Marks :</b>	100
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	800894515
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 101 Question Id : 80089422956 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**



The gouge in carpentry is a type of

**Options :**

1. ✓ Chisel
2. ✗ Hammer
3. ✗ Saw
4. ✗ Screw Driver

**Question Number : 102 Question Id : 80089422957 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A mortise gauge is a

**Options :**

1. ✗ Striking tool.
2. ✗ Single marking point marking tool.
3. ✗ Planning tool.
4. ✓ Two marking point marking tool.

**Question Number : 103 Question Id : 80089422958 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following forging operation is used to increase the cross-sectional area of the stock at the expense of its length ?

**Options :**

1. ✘ Fullering
2. ✘ Punching
3. ✘ Drawing out
4. ✔ Upsetting

**Question Number : 104 Question Id : 80089422959 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The operation of smoothing and squaring the surface around a hole is known as

**Options :**

1. ✘ Trepanning.
2. ✘ Under cutting.
3. ✘ Counter sinking.
4. ✔ Spot facing.

**Question Number : 105 Question Id : 80089422960 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following material will have a recrystallisation temperature below or near to the room temperature?

**Options :**

1. ✓ Tin
2. ✗ Copper
3. ✗ Nickel
4. ✗ Tungsten

**Question Number : 106 Question Id : 80089422961 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The increase in hardness due to cold working, is called

**Options :**

1. ✗ Induction hardening.
2. ✗ Age-hardening.
3. ✓ Work-hardening.
4. ✗ Flame hardening.

**Question Number : 107 Question Id : 80089422962 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The intermediate moulding flask used in sand casting is called

**Options :**

1. ✗ Cope

2. ✘ Drag

3. ✔ Cheek

4. ✘ Core

**Question Number : 108 Question Id : 80089422963 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In pattern making, the shrinkage allowance is provided mainly to compensate

**Options :**

1. ✔ Solid contraction.

2. ✘ Liquid contraction.

3. ✘ thermal expansion

4. ✘ Gasses removal

**Question Number : 109 Question Id : 80089422964 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a vernier calliper, the main scale reads in millimetres with a least count of 0.1 mm. Ten divisions on

the vernier correspond to nine divisions of the main scale. The least count of the calliper is

**Options :**

1. ✘ 0.9 mm

2. ✘ 0.1 mm

3. ✔ 0.01 mm

4. ✘ 0.09 mm

**Question Number : 110 Question Id : 80089422965 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0**

The instrument used for measuring the height of shoulder is

**Options :**

1. ✘ Inside micrometer.

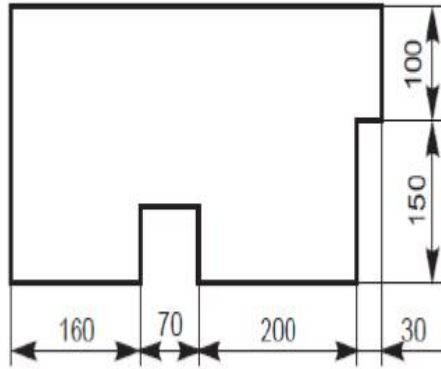
2. ✔ Vernier depth gauge.

3. ✘ Telescopic gauge.

4. ✘ Micrometer calipers.

**Question Number : 111 Question Id : 80089422966 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0**

The arrangement of dimensions on a drawing is as given in the following figure . Name the type of dimensioning. All the dimensions are in mm only



**Options :**

1. ✘ Parallel Dimensioning
2. ✔ Chain Dimensioning
3. ✘ Combined Dimensioning
4. ✘ Co-Ordinated Dimensioning

**Question Number : 112 Question Id : 80089422967 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Castle nut is an example of

**Options :**

1. ✘ Hexagonal nut.
2. ✘ Capstan nut.
3. ✘ Dome nut.

4. ✓ Lock nut.

Question Number : 113 Question Id : 80089422968 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

In a Body-centered Cubic (BCC) structure, total number of atoms per unit cell are

Options :

1. ✓ 2

2. ✗ 4

3. ✗ 8

4. ✗ 12

Question Number : 114 Question Id : 80089422969 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The total area under the stress-strain curve of a mild steel specimen tested up to failure under tension is a measure of

Options :

1. ✗ Ductility

2. ✓ Toughness

3. ✗ Ultimate strength

4. ✘ Stiffness

Question Number : 115 Question Id : 80089422970 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The impurity present in the ore is called as

Options :

1. ✘ Mineral

2. ✘ Flux

3. ✘ Slag

4. ✔ Gangue

Question Number : 116 Question Id : 80089422971 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Austenite is a solid solution of carbon in which of the following ?

Options :

1. ✘ Alpha iron

2. ✔ Gamma iron

3. ✘ Delta iron

4. ✘ Beta iron



**Question Number : 117 Question Id : 80089422972 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In which of the following heat treatment process, a steel part is heated to the maximum temperature

and cooling takes place in the presence of air?

**Options :**

1. ✘ Annealing
2. ✘ Hardening
3. ✔ Normalizing
4. ✘ Spheroidizing

**Question Number : 118 Question Id : 80089422973 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

When carbon content increases in the plain carbon steels, which of the following properties

are raising ?

**Options :**

1. ✘ Ductility and ultimate tensile strength
2. ✔ Tensile strength and hardness
3. ✘ Tensile strength and malleability
4. ✘ Ductility and melting temperature

**Question Number : 119 Question Id : 80089422974 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The sequence of operations involved in the powder metallurgy process is

**Options :**

1. ✓ Blending – Compaction – Sintering - Heat treatment
2. ✗ Compaction - Blending – Sintering - Heat treatment
3. ✗ Blending – Compaction – Heat treatment - Sintering
4. ✗ Blending – Sintering - Compaction – Heat treatment

**Question Number : 120 Question Id : 80089422975 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A stone of mass  $m$  at the end of a string of length  $L$  is whirled in a vertical circle at a constant speed. The tension in the string will be maximum when the stone is

**Options :**

1. ✗ At the top of the circle
2. ✓ At the bottom of the circle
3. ✗ Half-way down from the top
4. ✗ Quarter way down from the top

**Question Number : 121 Question Id : 80089422976 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Five equal forces each of 20 N are acting at a point in the same plane. If the angle between them are

same, then the resultant of these forces is

**Options :**

1. ✘ 100 N

2. ✘ 40 N

3. ✘ 20 N

4. ✔ 0

**Question Number : 122 Question Id : 80089422977 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The area moment of inertia of a square of size 1 unit about its diagonal is

**Options :**

1. ✔ 0.5

2. ✘ 0.33

3. ✘ 0.24

4. ✘ 0.167

Question Number : 123 Question Id : 80089422978 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The D'Alembert's principle

Options :

1. ✘ is equivalent to Newton's first law of motion
2. ✘ explains the conservation of momentum of a system
3. ✔ is used to convert dynamic equilibrium to static equilibrium
4. ✘ Is used only when the inertia force is zero.

Question Number : 124 Question Id : 80089422979 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A bar of length  $L$  uniformly heated from  $0^\circ\text{C}$  to a temperature of  $t^\circ\text{C}$ .  $E$  is the modulus of elasticity and coefficient of linear expansion is  $\alpha$ . The stress in the bar is

Options :

1. ✔  $\alpha tE$
2. ✘  $\alpha tE/2$
3. ✘ Zero
4. ✘  $\alpha tE/L$

Question Number : 125 Question Id : 80089422980 Question Type : MCQ Option Shuffling : Yes

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A cantilever beam of span  $L$  carries a clockwise moment  $M$  at the free end. The shear force is

**Options :**

1. ✓ Zero throughout the span
2. ✗ Uniform throughout the span
3. ✗ Varies linearly from free end to fixed end
4. ✗ Varies linearly from fixed end to free end

**Question Number : 126 Question Id : 80089422981 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The shape of the bending moment diagram for a uniform cantilever beam carrying a uniformly distributed load over its length is

**Options :**

1. ✗ a straight line
2. ✗ a hyperbola
3. ✗ an ellipse
4. ✓ a parabola

**Question Number : 127 Question Id : 80089422982 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A beam said to be loaded in pure bending, if

**Options :**

1. ✘ The shear force varies and bending moment is uniform throughout the span
2. ✘ Both the shear force and bending moment are uniform throughout the span
3. ✔ The shear force is zero and bending moment is uniform throughout the span
4. ✘ Both the shear force and bending moment are zero throughout the span

**Question Number : 128 Question Id : 80089422983 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A steel cantilever 2 m long is to carry a concentrated load of 3 kN at the free end. If the maximum stress due to bending is not to exceed  $120 \text{ N/mm}^2$  and the cross-section of the beam is circular, find its diameter

**Options :**

1. ✘ 10 mm
2. ✘ 20 mm
3. ✘ 40 mm
4. ✔ 80 mm

**Question Number : 129 Question Id : 80089422984 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**



The magnitude of shear stress induced in a circular shaft due to torsion

**Options :**

1. ✓ Varies from zero at the centre to the maximum at the circumference
2. ✗ Varies from Maximum at the centre to the zero at the circumference
3. ✗ Remains constant from the centre to the circumference
4. ✗ Is inversely proportional to torque and angle of twist

**Question Number : 130 Question Id : 80089422985 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A metal pipe of 1 m diameter, contains a fluid having a pressure of  $1 \text{ N/mm}^2$ . If the permissible tensile stress in the material is  $20 \text{ N/mm}^2$ , then the thickness of the metal required for making the pipe would be

**Options :**

1. ✓ 25 mm
2. ✗ 20 mm
3. ✗ 10 mm
4. ✗ 5 mm

**Question Number : 131 Question Id : 80089422986 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a CNC vertical milling machine, for carrying out an operation like end milling the spindle head is to be positioned along the

**Options :**

1. ✘ X-axis
2. ✘ Y-axis
3. ✔ Z-axis
4. ✘ S-axis

**Question Number : 132 Question Id : 80089422987 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is correct for the control unit and panel of NC (Numerical Control) and CNC (Computer Numerical Control) machine tools?

**Options :**

- The control unit of NC machine tool works in ON-line mode and the control unit of
1. ✘ CNC machine tool works in batch processing mode
- The control unit of NC machine tool works in batch processing mode and the control
2. ✔ unit of CNC machine tool works in ON-line mode
  3. ✘ The control units of both NC and CNC machines work in ON-line mode
  4. ✘ The control units of both NC and CNC machines work in batch processing mode

**Question Number : 133 Question Id : 80089422988 Question Type : MCQ Option Shuffling : Yes**



**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a CNC program, the word address format used for preparatory functions is

**Options :**

1. ✘ M

2. ✘ N

3. ✔ G

4. ✘ P

**Question Number : 134 Question Id : 80089422989 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Flexible Manufacturing Systems (FMS) can be better explained as

**Options :**

1. ✘ it moves materials between operations

2. ✘ it moves and manipulates products, parts or tools

3. ✔ it completely manufactures a range of components without significant human intervention during the processing

4. ✘ it co-ordinates the whole process of manufacturing and manufactures a part, component or product

**Question Number : 135 Question Id : 80089422990 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Creep is important factor in the design of

**Options :**

1. ✘ Flywheel of steam engine
2. ✘ Cycle Chain
3. ✘ Cast Iron pipes
4. ✔ Gas Turbine Blades

**Question Number : 136 Question Id : 80089422991 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A bolt which is threaded on both ends can be generally known as

**Options :**

1. ✘ Set Screw
2. ✘ Tap bolt
3. ✘ Through Bolt
4. ✔ Stud Bolt

**Question Number : 137 Question Id : 80089422992 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Self-locking in a power screw is better achieved by increasing the coefficient of friction and

**Options :**

1. ✘ Decreasing the Angle of friction
2. ✘ Increasing the helix angle of screw
3. ✔ Decreasing the helix angle of screw
4. ✘ Increasing the angle of friction

**Question Number : 138 Question Id : 80089422993 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A cold rolled steel shaft designed on the basis of maximum shear stress theory. The principal stresses induced at its critical section are 60 MPa and -60 MPa respectively. If the yield stress for shaft material is 360 MPa, the factor of safety (N) of the design

**Options :**

1. ✘ 2
2. ✔ 3
3. ✘ 4
4. ✘ 6

**Question Number : 139 Question Id : 80089422994 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A key which transmits power through frictional resistance only is

**Options :**

1. ✘ Woodruff key
2. ✔ Saddle key
3. ✘ Kennedy key
4. ✘ Sunk key

**Question Number : 140 Question Id : 80089422995 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Generally for the Sunk key, the standard height in terms of shaft diameter 'd' is given by

**Options :**

1. ✘  $d/2$
2. ✘  $d$
3. ✘  $d/4$
4. ✔  $d/6$

**Question Number : 141 Question Id : 80089422996 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

When the bearing is subjected to large fluctuations of load and heavy impacts, the ratio of bearing characteristic number to the bearing modulus should be

**Options :**

1. ✘ 5
2. ✘ 10
3. ✔ 15
4. ✘ 20

**Question Number : 142 Question Id : 80089422997 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The angle between the direction of follower motion and normal to the pitch curve is known as

**Options :**

1. ✔ Pressure angle
2. ✘ Pitch angle
3. ✘ Prime angle
4. ✘ Base angle

**Question Number : 143 Question Id : 80089422998 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The total slip will occur in a belt drive when

**Options :**

1. ✘ Angle of rest > angle of creep

2. ✘ Angle of creep > angle of rest
3. ✘ Angle of creep is zero
4. ✔ Angle of rest is zero

**Question Number : 144 Question Id : 80089422999 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The relation between circular pitch 'P<sub>c</sub>' and diametral pitch 'P<sub>d</sub>' is given by

**Options :**

1. ✘  $P_d = \frac{1}{P_c}$

2. ✘  $P_c = \frac{2}{P_d}$

3. ✔  $P_d = \frac{\pi}{P_c}$

4. ✘  $P_c = \pi P_d$

**Question Number : 145 Question Id : 80089423000 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In a lathe, taper turning means to produce a \_\_\_\_\_ surface by gradually decreasing the value of diameter from a cylindrical work piece.

**Options :**

1. ✓ conical

2. ✗ flat

3. ✗ Cylindrical

4. ✗ Square

**Question Number : 146 Question Id : 80089423001 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Enlarging an existing circular hole with a rotating single point tool is called

**Options :**

1. ✗ Internal Turning

2. ✓ Boring

3. ✗ Drilling

4. ✗ Reaming

**Question Number : 147 Question Id : 80089423002 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

-----mechanism is used in quick return motion mechanism for shaper

**Options :**

1. ✓ Crank and slotted lever mechanism

2. ✘ Fast pulley mechanism
3. ✘ With worth quick return mechanism
4. ✘ Slow and Loose pulley mechanism

**Question Number : 148 Question Id : 80089423003 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In a shaper machine, the forward stroke is completed in  $240^\circ$ . The value of speed ratio is

**Options :**

1. ✔ 2
2. ✘  $3/2$
3. ✘  $1/2$
4. ✘  $1/3$

**Question Number : 149 Question Id : 80089423004 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The rear teeth of a broach

**Options :**

1. ✔ remove minimum metal.
2. ✘ perform burnishing operation.



3. ✘ remove maximum metal.

4. ✔ remove no metal.

**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 : 150 Question Id : 80089423005 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following processes is used for good surface finish and fine dimensional tolerances?

**Options :**

1. ✘ Boring

2. ✔ Broaching

3. ✘ Drilling

4. ✘ Reaming

**Question Number : 151 Question Id : 80089423006 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The welding set up is said to have straight polarity, when

**Options :**

1. ✔ work is connected to the positive terminal and the electrode holder to the negative terminal.

2. ✘ work is connected to the positive terminal and the electrode holder is earthed.

3. ✘ work is connected to the negative terminal and the electrode holder to the positive terminal.
4. ✘ work is connected to the negative terminal and the electrode holder is earthed.

**Question Number : 152 Question Id : 80089423007 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a welding process, the arc is obtained between two tungsten electrodes rather than between the tungsten electrode and the work piece. Name the welding process.

**Options :**

1. ✘ Plasma arc welding
2. ✘ Gas Tungsten Arc Welding
3. ✘ Stud arc welding
4. ✔ Atomic hydrogen welding

**Question Number : 153 Question Id : 80089423008 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The most important quality of any lubricant is

**Options :**

1. ✘ Specific heat.
2. ✘ Specific gravity.

3. ✓ Viscosity.

4. ✗ Emulsification.

**Question Number : 154 Question Id : 80089423009 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The process used for cutting a gear on a milling machine is called

**Options :**

1. ✗ Hobbing

2. ✓ Forming

3. ✗ Grinding

4. ✗ Burnishing

**Question Number : 155 Question Id : 80089423010 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Honing is used for finishing.

**Options :**

1. ✗ External cylindrical surfaces and flat surfaces

2. ✓ Internal cylindrical surfaces and flat surfaces

3. ✘ Flat surfaces and hexagonal surfaces

4. ✘ External cylindrical surfaces and Internal cylindrical surfaces

**Question Number : 156 Question Id : 80089423011 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following metals cannot be electroplated?

**Options :**

1. ✘ Palladium

2. ✘ Nickel

3. ✘ Silver

4. ✔ Tungsten

**Question Number : 157 Question Id : 80089423012 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement is wrong about ultra-sonic machining?

**Options :**

1. ✘ It cuts materials at very slow speeds.

2. ✔ It removes large amount of material.

3. ✘ It is best suited for machining hard and brittle materials.

4. ✘ It produces good surface finish.

**Question Number : 158 Question Id : 80089423013 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following unconventional machining process uses thermoelectric energy in the material

removal?

**Options :**

1. ✘ Ultrasonic Machining

2. ✔ Electric Discharge Machining

3. ✘ Electrochemical Machining

4. ✘ Abrasive Flow Machining

**Question Number : 159 Question Id : 80089423014 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Temperature of a gas is produced due to

**Options :**

1. ✘ its heating value

2. ✔ kinetic energy of molecules

3. ✘ repulsion of molecules

4. ✖ attraction of molecules

Question Number : 160 Question Id : 80089423015 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A thermodynamic relation in terms of specific volume and temperatures for the polytropic process of perfect

gas is given by

Options :

1. ✖ 
$$\frac{T_2}{T_1} = \left(\frac{V_1}{V_2}\right)^{\frac{n-1}{n}}$$

2. ✔ 
$$\frac{T_2}{T_1} = \left(\frac{V_1}{V_2}\right)^{n-1}$$

3. ✖ 
$$\frac{T_2}{T_1} = \left(\frac{V_1}{V_2}\right)^{\frac{n}{n-1}}$$

4. ✖ 
$$\frac{T_2}{T_1} = \left(\frac{V_1}{V_2}\right)^{\frac{1}{n}}$$

Question Number : 161 Question Id : 80089423016 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A heat engine is supplied with 260 kJ/s of heat at a constant fixed temperature of 260 K and heat rejection takes

place at 110 K temperature. If the engine is reversible, the heat rejected (kJ/s) would be approximately equal to

Options :

1. ✘ 85

2. ✘ 140

3. ✔ 110

4. ✘ 155

**Question Number : 162 Question Id : 80089423017 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a Carnot cycle, heat is transferred at

**Options :**

1. ✘ constant pressure

2. ✔ constant temperature

3. ✘ constant volume

4. ✘ constant entropy

**Question Number : 163 Question Id : 80089423018 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

For the same maximum pressure and maximum temperature, the comparison among the Otto, Diesel and

dual internal combustion engine cycles is given by

**Options :**

1. ✘  $\eta_{otto} > \eta_{dual} > \eta_{diesel}$



2. ✘  $\eta_{dual} > \eta_{diesel} > \eta_{otto}$

3. ✘  $\eta_{otto} > \eta_{diesel} > \eta_{dual}$

4. ✔  $\eta_{diesel} > \eta_{dual} > \eta_{otto}$

**Question Number : 164 Question Id : 80089423019 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Ultimate analysis of fuel is determination of percentage of

**Options :**

1. ✔ carbon, hydrogen, nitrogen, sulphur and moisture

2. ✘ fixed carbon, ash, volatile matter, moisture

3. ✘ higher calorific value

4. ✘ lower calorific value

**Question Number : 165 Question Id : 80089423020 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

If one kg of CO requires  $\frac{4}{7}$  kg of Oxygen for the chemical reaction. Then the mass of carbon dioxide produced is

**Options :**

1. ✘  $\frac{7}{3}$  kg



2. ✘  $8/3$  kg

3. ✘  $11/3$  kg

4. ✔  $11/7$  kg

**Question Number : 166 Question Id : 80089423021 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

An ideal air standard Otto cycle has a compression ratio of 8.5. If the adiabatic index is 1.4, then what is the thermal efficiency in percentage of the Otto cycle

**Options :**

1. ✔ 57.5

2. ✘ 45.7

3. ✘ 52.5

4. ✘ 95

**Question Number : 167 Question Id : 80089423022 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

By providing better lubrication in internal combustion engine, which of the following efficiency will be improved?

**Options :**

1. ✘ Volumetric efficiency
2. ✘ Indicated thermal efficiency
3. ✘ Relative efficiency
4. ✔ Mechanical efficiency

**Question Number : 168 Question Id : 80089423023 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The output of a diesel engine can be increased without increasing the engine revolution or size in following way

**Options :**

1. ✘ feeding more fuel
2. ✘ increasing flywheel size
3. ✔ supercharging
4. ✘ scavenging

**Question Number : 169 Question Id : 80089423024 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A rope brake dynamometer was used to measure the brake power of single cylinder four stroke petrol

engine. It was found that the torque due to brake load is 600 N-m and the engine makes 500 rpm. The brake

power of the engine is

**Options :**

1. ✓ 31.4 kW
2. ✗ 15.7 kW
3. ✗ 62.8 kW
4. ✗ 24.0 kW

**Question Number : 170 Question Id : 80089423025 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

During a Morse test on 4- cylinder engine, the following measurements of brake power were taken at constant speed.

All cylinders firing 3037 kW

1<sup>st</sup> cylinder not firing 2102 kW

2<sup>nd</sup> cylinder not firing 2102 kW

3<sup>rd</sup> cylinder not firing 2100 kW

4<sup>th</sup> cylinder not firing 2098 kW

The mechanical efficiency of the engine is

**Options :**

1. ✗ 91.53%
2. ✗ 85.07%
3. ✓ 81.07%

4. ✘ 61.22%

**Question Number : 171 Question Id : 80089423026 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

During the compression process, the work required is maximum if the thermodynamic process follow

**Options :**

1. ✔ Isentropic process

2. ✘ Isothermal process

3. ✘ Polytropic process

4. ✘ Isochoric process

**Question Number : 172 Question Id : 80089423027 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Optimum intermediate pressure in two stage compressor is

**Options :**

1. ✘ average of suction and delivery pressure

2. ✘ 50% of difference of two pressures

3. ✔ geometric mean of two pressures

4. ✘ one fourth of sum of suction and delivery pressure

**Question Number : 173 Question Id : 80089423028 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a centrifugal compressor, the degree of reaction is being defined as

**Options :**

1. ✓ the ratio of pressure rise in impeller and pressure rise in the compressor
2. ✗ the ratio of pressure rise in the diffuser and pressure rise in the compressor
3. ✗ the ratio of pressure rise in the impeller and pressure rise in the diffuser
4. ✗ the ratio of pressure rise in the diffuser and pressure rise in the impeller

**Question Number : 174 Question Id : 80089423029 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The number of compressors and turbines required for Ramjet engine are \_\_\_\_\_ and \_\_\_\_\_ respectively.

**Options :**

1. ✗ One, Zero
2. ✗ Zero, One
3. ✗ One, One
4. ✓ Zero, Zero

**Question Number : 175 Question Id : 80089423030 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The values of enthalpy of steam at the inlet and outlet of a steam turbine in a Rankine cycle are 3000 kJ/kg and 2000 kJ/kg respectively. Neglect the pump work, the specific steam consumption in kg/kW-hour is

**Options :**

1. ✓ 3.6
2. ✗ 0.36
3. ✗ 0.06
4. ✗ 0.01

**Question Number : 176 Question Id : 80089423031 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Latent heat of steam with increase in pressure

**Options :**

1. ✗ increases
2. ✗ remains same
3. ✓ decreases
4. ✗ behave unpredictably

**Question Number : 177 Question Id : 80089423032 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The component which is used to heat the feed water by using the waste hot gases before

leaving through chimney is known as

**Options :**

1. ✘ Air pre-heater
2. ✘ Re-heater
3. ✘ Super-heater
4. ✔ Economiser

**Question Number : 178 Question Id : 80089423033 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The maximum discharge through a chimney occurs when the height of chimney is

**Options :**

1. ✘ infinitely long
2. ✘ around 200 meters
3. ✔ equal to the height of the hot gas column producing the draught
4. ✘ more than the tallest building nearby

**Question Number : 179 Question Id : 80089423034 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**



**Correct Marks : 1 Wrong Marks : 0**

The total enthalpy drop in the steam nozzle is 100 kJ/kg. If the steam velocity at the entry of the nozzle is neglected, then the velocity at the exit of the steam nozzle is

**Options :**

1. ✘ 100 m/s
2. ✔ 447.2 m/s
3. ✘ 44.72 m/s
4. ✘ 0 m/s

**Question Number : 180 Question Id : 80089423035 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In an impulse turbine, the energy supplied to the blades per kg of steam equals to

**Options :**

1. ✘ work done by steam
2. ✘ sum of kinetic and potential energy at inlet
3. ✘ reaction energy of steam
4. ✔ kinetic energy of steam jet at entrance per kg of steam

**Question Number : 181 Question Id : 80089423036 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**



**Correct Marks : 1 Wrong Marks : 0**

In the velocity triangles of steam turbine, the tangential component of the absolute velocity can be called as

**Options :**

1. ✘ relative velocity
2. ✔ whirl velocity
3. ✘ flow velocity
4. ✘ blade velocity

**Question Number : 182 Question Id : 80089423037 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In surface condenser used in steam power plant

**Options :**

1. ✔ water flows through tubes and steam surrounds tubes
2. ✘ steam flows through tubes and water surrounds tubes
3. ✘ steam and water get mixed
4. ✘ steam simply exhaust to atmosphere

**Question Number : 183 Question Id : 80089423038 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

“The liquids transmit the pressure equally in all directions”. This statement was given by

**Options :**

1. ✘ Archimedes
2. ✘ Boyle
3. ✘ Newton
4. ✔ Pascal

**Question Number : 184 Question Id : 80089423039 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The flow in which the velocity vector is identical in magnitude and direction at every point, for any given instant,

is known as

**Options :**

1. ✘ steady flow
2. ✔ uniform flow
3. ✘ streamline flow
4. ✘ one dimensional flow

**Question Number : 185 Question Id : 80089423040 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The area of pipe at two different sections P and Q are  $10 \text{ mm}^2$  and  $20 \text{ mm}^2$  respectively. If the velocity at section P is  $5 \text{ m/s}$ , then the velocity and discharge at section Q are

**Options :**

1. ✘  $5.0 \text{ m/s}$  and  $100 \times 10^{-6} \text{ m}^3/\text{s}$
2. ✘  $1.25 \text{ m/s}$  and  $25 \times 10^{-6} \text{ m}^3/\text{s}$
3. ✔  $2.5 \text{ m/s}$  and  $50 \times 10^{-6} \text{ m}^3/\text{s}$
4. ✘  $10.0 \text{ m/s}$  and  $10 \times 10^{-6} \text{ m}^3/\text{s}$

**Question Number : 186 Question Id : 80089423041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In Navier-stokes equation, the forces considered are

**Options :**

1. ✘ pressure, viscous and turbulence
2. ✔ gravity, pressure and viscous
3. ✘ gravity, pressure and turbulence
4. ✘ rotational flow

**Question Number : 187 Question Id : 80089423042 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In order to estimate the loss of head due to friction in pipes using Chezy's formula, the hydraulic mean depth is calculated as the ratio of

**Options :**

1. ✓ Area of the flow and wetted perimeter
2. ✗ Wetted perimeter and area of the flow
3. ✗ Area of the flow and diameter of the pipe
4. ✗ Wetted perimeter and diameter of the pipe

**Question Number : 188 Question Id : 80089423043 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A hydraulic turbine develops 1000 kW power for a head of 40 m. If the head is reduced to 20 m, the power developed in kW is

**Options :**

1. ✗ 177.77
2. ✓ 353.55
3. ✗ 500.90
4. ✗ 707.77

**Question Number : 189 Question Id : 80089423044 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The shape of the buckets used in Pelton turbine is \_\_\_\_\_

**Options :**

1. ✘ Semicircular
2. ✔ Hemispherical
3. ✘ Aerofoil
4. ✘ Cylindrical

**Question Number : 190 Question Id : 80089423045 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

If  $D$  is the diameter of Pelton wheel and  $d$  is the diameter of the jet, then number of buckets on the periphery of a

Pelton wheel is equal to

**Options :**

1. ✘  $(D/2d)$
2. ✘  $(D/2d) + 10$
3. ✔  $(D/2d) + 15$
4. ✘  $(D/2d) + 20$

**Question Number : 191 Question Id : 80089423046 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The manometric efficiency ( $\eta_{\text{mano}}$ ) of a centrifugal pump is given by \_\_\_\_\_

where  $H_m$  = manometric head

$g$  = acceleration due to gravity

$V_{w_2}$  = whirl velocity at the exit

$u_2$  = blade velocity at the exit

**Options :**

$$\frac{H_m}{gV_{w_2}u_2}$$

1. ✘

$$\frac{gH_m}{V_{w_2}u_2}$$

2. ✔

$$\frac{V_{w_2}u_2}{gH_m}$$

3. ✘

$$\frac{gV_{w_2}u_2}{H_m}$$

4. ✘

**Question Number : 192 Question Id : 80089423047 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A fast centrifugal pump impeller will have

**Options :**

1. ✘ forwarding facing blades

2. ✘ radial blades

3. ✓ backward facing blades

4. ✗ propeller type blades

**Question Number : 193 Question Id : 80089423048 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following activity is part of the production management?

**Options :**

1. ✓ Inventory and store management

2. ✗ Selection of appropriate sources of funds

3. ✗ Manpower planning

4. ✗ Need recognition and expectation of consumers

**Question Number : 194 Question Id : 80089423049 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The father of principles of management was

**Options :**

1. ✓ Henry Fayol.

2. ✗ Gilbreth.

3. ✗ F.W. Taylor.



4. ✘ Robert Owen.

**Question Number : 195 Question Id : 80089423050 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A firm has demand rate of the material as 40 units per week and lead time of supply of the raw

material is two weeks. The reorder point at the inventory level is

**Options :**

1. ✘ 10 units

2. ✘ 20 units

3. ✘ 40 units

4. ✔ 80 units

**Question Number : 196 Question Id : 80089423051 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

A feasible solution to the linear programming problem should

**Options :**

1. ✘ optimize the objective function.

2. ✘ satisfy the non-negativity restrictions.

3. ✘ satisfy the problem constraints.



4. ✓ satisfy the problem constraints and non-negativity restrictions.

**Question Number : 197 Question Id : 80089423052 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

The cost of training to the employee for quality improvement belongs to

**Options :**

1. ✗ Internal Failure Cost
2. ✗ Appraisal Cost
3. ✓ Prevention Cost
4. ✗ Capital Cost

**Question Number : 198 Question Id : 80089423053 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

Trademarks relate to

**Options :**

1. ✗ Practice and knowledge acquired through experience.
2. ✓ Brand identity.
3. ✗ The right to reproduce own original work.
4. ✗ The protection of proprietary information of commercial value.

**Question Number : 199 Question Id : 80089423054 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

An individual who initiates, creates and manages a new business can be called

**Options :**

1. ✘ A manager
2. ✔ An entrepreneur
3. ✘ A leader
4. ✘ A professional

**Question Number : 200 Question Id : 80089423055 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes Is Question Mandatory : No Option Orientation : Vertical**

**Correct Marks : 1 Wrong Marks : 0**

In a machine shop, a color code “ Blue” is used to represent the source of hazard for

**Options :**

1. ✔ A warning against starting of equipment after repair
2. ✘ Points in machinery that cause potential injury
3. ✘ Radiation hazards
4. ✘ Fire prevention