Andhra Pradesh State Council of Higher Education

Notations :

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

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

Question Paper Name :	Mechanical Engineering 20th June 2023 Shift 2
Duration :	180
Total Marks :	200
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No

Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Mathematics

Section Id :	418099384
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	50
Section Marks :	50
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 41809919203 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A\begin{bmatrix}0 & 1\\2 & -1\end{bmatrix}=\begin{bmatrix}2 & 1\\-1 & 0\end{bmatrix}$, where A is a square matrix of order 2 then A =

Options :

1. ✖ $\begin{bmatrix}2 & 1\\0 & 0\end{bmatrix}$

2. ✖ $\begin{bmatrix}0 & 1\\2 & -1\end{bmatrix}$

3. ✖ $\begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$

4. ✔ $\begin{bmatrix} 2 & 1 \\ -1/2 & -1/2 \end{bmatrix}$

Question Number : 2 Question Id : 41809919204 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the matrix $A = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$ is expressed as the sum of a symmetric and a skew symmetric. Then the symmetric matrix is

Options :

1. ✖ $\begin{bmatrix} 2 & 1 \\ 2 & 4 \end{bmatrix}$

2. ✖ $\begin{bmatrix} 2 & 4 \\ 4 & 1 \end{bmatrix}$

3. ✔ $\begin{bmatrix} 2 & 4 \\ 4 & -1 \end{bmatrix}$

4. ✖ $\begin{bmatrix} 4 & 2 \\ 2 & -1 \end{bmatrix}$

Question Number : 3 Question Id : 41809919205 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If A is any square matrix of order n, then $|adj\ A|$ is equal to

Options :

1. ✔ $|A|^{n-1}$

2. ✖ $|A|^{n}$

3. ✖ $|A|$

4. ✖ $\frac{1}{|A|}$

Question Number : 4 Question Id : 41809919206 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A-B=\begin{bmatrix}1 & 0\\ 0 & -1\end{bmatrix}$, $A+B=\begin{bmatrix}3 & 4\\ 2 & 5\end{bmatrix}$ then AB =

Options :

1. ✔ $\begin{bmatrix}4 & 10\\ 3 & 8\end{bmatrix}$

2. ✖ $\begin{bmatrix}4 & 3\\ 10 & 8\end{bmatrix}$

3. ✖ $\begin{bmatrix}4 & -10\\ -3 & 8\end{bmatrix}$

4. ✖ $\begin{bmatrix}4 & 10\\ -3 & 8\end{bmatrix}$

Question Number : 5 Question Id : 41809919207 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -1

2. ✔ 0

3. ✖ 2

4. ✖ 1

Question Number : 6 Question Id : 41809919208 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{x+4}{(x^2-4)(x+1)} = \frac{A}{(x-2)} + \frac{B}{(x+2)} + \frac{C}{(x+1)}$ then $A + B - C =$

Options :

1. ✖ -1

2. ✖ 0

3.

✔ 2

4. ✖ 1

Question Number : 7 Question Id : 41809919209 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{x^2-10x+1}{(x^2-5x+6)(x-1)} = \frac{A}{(x-1)} + \frac{B}{(x-2)} + \frac{-4}{(x-3)}$ then A + B

Options :

1. ✖ -2

2. ✖ 3

3. ✔ 5

4. ✖ 4

Question Number : 8 Question Id : 41809919210 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\frac{\sec x+1-\tan x}{\tan x-\sec x+1} =$

Options :

1. ✖ $\frac{1-\cos x}{\sin x}$

2. ✔ $\frac{1+\cos x}{\sin x}$

3. ✖ $\frac{1+\sin x}{\cos x}$

4. ✖ $\frac{1-\sin x}{\cos x}$

Question Number : 9 Question Id : 41809919211 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The least value of $2\sin^2\theta + 3\cos^2\theta$ is

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 5

Question Number : 10 Question Id : 41809919212 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The value of $tan\ 10^o + tan\ 70^o - tan\ 50^o$ is

Options :

1. ✖ $-\sqrt{3}$

2. ✔ $\sqrt{3}$

3. ✖ $\frac{1}{\sqrt{2}}$

4. ✖ $-\frac{1}{\sqrt{2}}$

Question Number : 11 Question Id : 41809919213 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $tan\ 3A - tan\ 2A - tan\ A$ is equal to

Options :

1. ✔ $tan\ 3A\ \tan 2A\ \tan A$

2. ✖ $-\ tan\ 3A\ \tan 2A\ \tan A$

3. ✖ $\tan A\ \tan 2A - \tan 2A\ \ tan3A - tan3A\ tanA$

4. ✖ $\tan A\ \tan 2A + \tan 2A\ \ tan3A - tan3A\ tanA$

Question Number : 12 Question Id : 41809919214 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $sin\ \frac{\pi}{14}\ sin\ \frac{3\pi}{14}\ sin\ \frac{5\pi}{14}$ is

Options :

1. ✖ $\frac{1}{16}$

2. ✔ $\frac{1}{8}$

3. ✖ $\frac{1}{2}$

4. ✖ 1

Question Number : 13 Question Id : 41809919215 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $tan^2\theta + \sec\theta = 5$ then the value of $\cos\theta$ is

Options :

1. ✔ $\frac{-1}{3}\ or\ \frac{1}{2}$

2. ✖ $\frac{-11}{12}$ or $\frac{1}{2}$

3. ✖ $\frac{13}{12}$ or $\frac{1}{3}$

4. ✖ $\frac{5}{4}$ or $\frac{1}{2}$

Question Number : 14 Question Id : 41809919216 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of solutions of the equation tan x + sec x = 2 cos x lying in the interval [0, 2π] is

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

4. ✔ 3

Question Number : 15 Question Id : 41809919217 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

If $\cos\theta = \frac{1}{2}\left(a + \frac{1}{a}\right)$ then $cos3\theta = K(a^3 + \frac{1}{a^3})$ where K is equal to

Options :

1. ✔ $\frac{1}{2}$

2. ✖ $-\frac{1}{2}$

3. ✖ 1

4. ✖ $\frac{3}{2}$

Question Number : 16 Question Id : 41809919218 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $Sin\,\theta + Sin\,3\theta + Sin\,5\theta = 0, 0 \leq \theta \leq \frac{\pi}{2}$ then $\theta =$

Options :

1. ✔ $0, \frac{\pi}{3}$

2. ✖ $0, \frac{\pi}{2}$

3. ✖ $1, \frac{\pi}{2}$

4. ✖ $2, \frac{\pi}{3}$

Question Number : 17 Question Id : 41809919219 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $sin^{-1}\frac{12}{13} + cos^{-1}\frac{4}{5} + tan^{-1}\frac{63}{16}$ is

Options :

1. ✖ $-\pi$

2. ✔ π

3. ✖ $tan^{-1}\frac{4}{5}$

4. ✖ $-tan^{-1}\frac{4}{5}$

Question Number : 18 Question Id : 41809919220 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $2 + i\sqrt{3}$ is a root of the equation $x^2 + px + q = 0$ where p and q are real, the (p, q) =

Options :

1. ✖ (-3, 7)

2. ✖ (-4, 9)

3. ✔ (-4, 7)

4. ✖ (-3, 9)

Question Number : 19 Question Id : 41809919221 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $i^2 + i^4 + i^6 + \ldots (2n+1)\ terms =$

Options :

1. ✖ 1

2. ✔ -1

3. ✖ 0

4. ✖ i

Question Number : 20 Question Id : 41809919222 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The locus of the point equidistant from the points $(a,\ b)$ and $(b,\ a)$ is ___

Options :

1. ✖ $bx - ay = 0$

2. ✖ $bx + ay = 0$

3. ✖ $ax - by = 0$

4. ✔ $x - y = 0$

Question Number : 21 Question Id : 41809919223 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The point $(-1,0)$ lies on the circle $x^2 + y^2 - 4x + 8y + k = 0$. The radius of the circle is

Options :

1. ✖ 4

2. ✔ 5

3. ✖ 3

4. ✖ 2

Question Number : 22 Question Id : 41809919224 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equation of the circle whose centre is the point (1, -3) and touches the line $2x - y - 4 = 0$ is

Options :

1. ✖ $x^2 + y^2 - 4x + 8y + \frac{49}{5} = 0$

2. ✖ $x^2 + y^2 - 2x + 8y + \frac{49}{5} = 0$

3. ✔ $x^2 + y^2 - 2x + 6y + \frac{49}{5} = 0$

4. ✖ $x^2 + y^2 + 2x + 6y + \frac{49}{5} = 0$

Question Number : 23 Question Id : 41809919225 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The line $y = mx + 1$ is a tangent to the parabola $y^2 = 4x$ if

Options :

1. ✔ $m = 1$

2. ✖ $m = 2$

3. ✖ $m = 3$

4. ✖ $m = 4$

Question Number : 24 Question Id : 41809919226 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The angle between the tangents drawn from the origin to the parabola $y^2 = 4a(x - a)$ is

Options :

1. ✖ 30^o

2. ✖ 45^o

3. ✖ 60^o

4. ✔ 90^o

Question Number : 25 Question Id : 41809919227 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of the latus rectum and eccentricity of the ellipse $25x^2 + 16y^2 = 400$ is

Options :

1. ✔ $(\frac{32}{5}, \frac{3}{5})$

2. ✖

$(\frac{32}{5}, \frac{-3}{5})$

3. ✖ $(\frac{-32}{5}, \frac{3}{5})$

4. ✖ $(\frac{-32}{5}, \quad \frac{-3}{5})$

Question Number : 26 Question Id : 41809919228 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = tan^{-1}\frac{\cos x}{1+\sin x}$ then $\frac{dy}{dx} =$

Options :

1. ✖ $\frac{1}{2}$

2. ✔ $\frac{-1}{2}$

3. ✖ 0

4. ✖ 1

Question Number : 27 Question Id : 41809919229 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = 10^{\log \sin x} + \tan h^{-1}(\sqrt{x})$ then $\frac{dy}{dx} =$

Options :

1. ✔ $10^{\log \sin x} \log_e 10 \cot x + \frac{1}{2\sqrt{x}} \sec h^2(\sqrt{x})$

2. ✖ $10^{\log \sin x} \log_e 10 \cot x - \frac{1}{2\sqrt{x}} \sec h^2(\sqrt{x})$

3. ✖ $10^{\log \sin x} \log_e 10 \tan x + \frac{1}{2\sqrt{x}} \sec h^2(\sqrt{x})$

4. ✖ $10^{\log \sin x} \log_e 10 \tan t x - \frac{1}{2\sqrt{x}} \sec h^2(\sqrt{x})$

Question Number : 28 Question Id : 41809919230 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = \begin{cases} 3^x \cdot 4, & for\ x < 0 \\ 2a + x, & for\ x \geq 0 \end{cases}$ is continuous at $x = 0$ then a =

Options :

1. ✖ 0

2. ✔ 2

3. ✖ 1

4. ✖ 3

Question Number : 29 Question Id : 41809919231 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x = a(\cos\theta + \theta \sin\theta), y = a(\sin\theta - \theta \cos\theta)$ then the value of $\frac{dy}{dx}$ $at\ \theta = \frac{\pi}{4}$ is

Options :

1. ✖ 0

2. ✖ $\frac{1}{\sqrt{3}}$

3. ✔ 1

4. ✖ $\sqrt{3}$

Question Number : 30 Question Id : 41809919232 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = \frac{x^3+y^3}{x-y}$ and if $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = ku, then\ k = \_\_$

Options :

1. ✖ 3

2. ✖ -3

3. ✔ 2

4. ✖ -1

Question Number : 31 Question Id : 41809919233 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum value of $\frac{logx}{x}, 0 < x < \infty$ is

Options :

1. ✖ e

2. ✔ $\frac{1}{e}$

3. ✖ 1

4. ✖ $e+1$

Question Number : 32 Question Id : 41809919234 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum value of the function $2x^3 - 3x^2 - 12x + 4$ is

Options :

1. ✖ 13

2. ✖ 12

3. ✔ 11

4. ✖ 10

Question Number : 33 Question Id : 41809919235 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = f(x + ay) + g(x - ay)$, then $\frac{\partial^2 u}{\partial y^2}$ is equal to

Options :

1. ✖ $\frac{\partial^2 u}{\partial x^2}$

2. ✖ $a\frac{\partial^2 u}{\partial x^2}$

3. ✔ $a^2\frac{\partial^2 u}{\partial x^2}$

4. ✖ $\frac{\partial^2 u}{\partial x \partial y}$

Question Number : 34 Question Id : 41809919236 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the curves $y^2 = 4(x+1)$ and $y^2 = k(9-x)$ cut orthogonally at (1, 1), then k =

Options :

1. ✔ 1

2. ✖ - 1

3. ✖ 2

4. ✖ 9

Question Number : 35 Question Id : 41809919237 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The stationary point and the corresponding stationary value of the function $f(x) = x^3 - 3x^2 - 9x + 22$ is

Options :

1. ✖ (1, 27)

2. ✔ (-1, 27)

3. ✖ (-1, 29)

4. ✖ (-1, 25)

Question Number : 36 Question Id : 41809919238 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int e^x \left(\frac{2+\sin 2x}{1+\cos 2x}\right) dx =$$

Options :

1. ✖ $e^x \sec x + c$

2. ✔ $e^x \tan x + c$

3. ✖ $e^x \cot x + c$

4. ✖ $e^x \operatorname{cosec} x + c$

Question Number : 37 Question Id : 41809919239 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int_0^{\pi} \frac{1}{5+4\cos x} dx =$$

Options :

1. ✖ $\frac{\pi}{2}$

2. ✔ $\frac{\pi}{3}$

3. ✖ $\frac{\pi}{4}$

4. ✖ π

Question Number : 38 Question Id : 41809919240 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of the arc of the curve $y = \log \sec x$ from $x = 0$ to $x = \frac{\pi}{3}$ is

Options :

1. ✔ $\log(2+\sqrt{3})$

2. ✖ $\log(2-\sqrt{3})$

3. ✖ $\log(1+\sqrt{3})$

4. ✖ $\log(1-\sqrt{3})$

Question Number : 39 Question Id : 41809919241 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{20}{3}$

2. ✖ $-\frac{20}{3}$

3. ✖ $\frac{10}{3}$

4. ✖ $\frac{15}{3}$

Question Number : 40 Question Id : 41809919242 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\int \frac{1}{e^x+e^{-x}}\,dx =$

Options :

1. ✖ $\log(e^x + e^{-x}) + C$

2. ✔ $tan^{-1}e^x + C$

3. ✖ $\frac{1}{e^x+e^{-x}} + C$

4. ✖ $cot^{-1}e^x + C$

Question Number : 41 Question Id : 41809919243 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\int \frac{x^3}{\sqrt{(x^2+1)}}\,dx = A\,(x^2+1)^{\frac{3}{2}} - B\,(x^2+1)^{\frac{1}{2}} + c$ then A + B =

Options :

1. ✖ $-\frac{3}{4}$

2. ✖ $\frac{2}{3}$

3. ✔ $\frac{4}{3}$

4. ✖ $\frac{5}{4}$

Question Number : 42 Question Id : 41809919244 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $S_n = \int_0^{\pi/2} \frac{\sin(2n-1)x}{\sin x}\,dx$ and n is an integer then $S_{n+1} - S_n$ =

Options :

1. ✖ $-\frac{\pi}{2}$

2. ✔ 0

3. ✖ 1

4. ✖ $\frac{\pi}{2}$

Question Number : 43 Question Id : 41809919245 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = \begin{cases} x^2, & for \quad 0 \le x < 1 \\ \sqrt{x}, & for \quad 1 < x \le 2 \end{cases}$, then $\int_0^2 f(x)\, dx =$

Options :

1. ✖ $\left(\frac{4\sqrt{2}+1}{3}\right)$

2. ✖ $\left(\frac{-4\sqrt{2}+1}{3}\right)$

3. ✔ $\left(\frac{4\sqrt{2}-1}{3}\right)$

4. ✖ $\left(\frac{-4\sqrt{2}-1}{3}\right)$

Question Number : 44 Question Id : 41809919246 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of arbitrary constants in a general solution of second order differential equation contains

Options :

1. ✖ Zero

2. ✖ One

3. ✔ Two

4. ✖ Three

Question Number : 45 Question Id : 41809919247 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of $\frac{x\,dx+y\,dy}{x^2+y^2} = 0$ is

Options :

1. ✖ $\log(x+y) = c$

2. ✔ $\log(x^2+y^2) = c$

3. ✖ $\log(xy) = c$

4. ✖ $\log(x-y) = c$

Question Number : 46 Question Id : 41809919248 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The integrating factor for the differential equation $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)^2$ is _____

Options :

1. ✔ $\frac{1}{x+1}$

2. ✖ $x+1$

3. ✖ $\frac{1}{x^2+1}$

4. ✖ x^2+1

Question Number : 47 Question Id : 41809919249 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Particular Integral of $(D^2 - 2D + 1)y = \cos hx$ is

Options :

1. ✔ $\frac{x^2e^x}{4} + \frac{e^{-x}}{8}$

2. ✖ $\frac{x^2e^{-x}}{4} + \frac{e^x}{8}$

3. ✖ $\frac{x^2e^x}{4} - \frac{e^{-x}}{8}$

4. ✖

$\frac{x^2e^{-x}}{4} - \frac{e^x}{8}$

Question Number : 48 Question Id : 41809919250 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$ under the condition that $y = 1$ when $x = 1$ is

Options :

1. ✖ $4xy = x^3 + 3$

2. ✔ $4xy = x^4 + 3$

3. ✖ $4xy = y^3 + 3$

4. ✖ $4xy = y^4 + 3$

Question Number : 49 Question Id : 41809919251 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of the differential equation $\frac{d^4y}{dx^4} + 2\frac{d^2y}{dx^2} + y = 0$ is

Options :

1. ✔ $y = (c_1 + c_2x)\sin x + (c_3 + c_4x)\cos x$

2. ✖ $y = (c_1 \sin x + c_2 \cos x + x \sin x + x \cos x)$

3. ✖ $y = (c_1 \sin x + c_2 \cos x + c_3 \tan x + c_4 \cot x)$

4. ✖ $y = (c_1 \sin x + c_2 \cos x + c_3 x + c_4)$

Question Number : 50 Question Id : 41809919252 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of $(D^2 - 4)y = \sin 3x$ is

Options :

1. ✖ $c_1 e^{-2x} + c_2 e^{2x} + \frac{1}{13}\sin 3x$

2. ✔ $c_1 e^{-2x} + c_2 e^{2x} - \frac{1}{13}\sin 3x$

3. ✖ $c_1 e^{-2x} + c_2 e^{2x} - \frac{1}{5}\sin 3x$

4. ✖ $c_1 e^{-2x} + c_2 e^{2x} + \frac{1}{5}\sin 3x$

Physics

Section Id :	418099385
Section Number :	2
Mandatory or Optional :	Mandatory
Number of Questions :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 51 Question Id : 41809919253 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the force (F), velocity (V) and time (T) are taken as fundamental units,

then the dimensions of mass are

Options :

1. ✔ $[FV^{-1}T]$

2. ✖ $[FVT^{-1}]$

3. ✖ $[FV^{-1}T^{-1}]$

4. ✖ $[FVT^{-2}]$

Question Number : 52 Question Id : 41809919254 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the units of force and velocity are doubled, then the units of power will

Options :

1. ✖ be halved

2. ✖ be doubled

3. ✔ be quadrupled

4. ✖ remain unaffected.

Question Number : 53 Question Id : 41809919255 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnitude of vector $3i+2j+12k$ is given by

Options :

1. ✔ $\sqrt{157}$

2. ✖ $\sqrt{112}$

3. ✖ $\sqrt{213}$

4. ✖ $9\sqrt{3}$

Question Number : 54 Question Id : 41809919256 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vector makes equal angle with the positive direction of all the three coordinate axes. Then each angle is equal to

Options :

1. ✖ $Cos^{-1}(-1/3)$

2. ✖ $Cos^{-1}(-2/3)$

3. ✔ $Cos^{-1}(1/\sqrt{3})$

4. ✖ $Cos^{-1}(2/3)$

Question Number : 55 Question Id : 41809919257 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Four bodies P, Q, R& S are projected with equal velocities having angle of projection 15 ,30 ,45 &60 with the horizontal plane respectively. The body having low horizontal range is

Options :

1. ✖

Q

2. ✔ P

3. ✖ S

4. ✖ R

Question Number : 56 Question Id : 41809919258 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Co-efficient of rolling friction is _____ Co-efficient of sliding friction.

Options :

1. ✖ Equal to

2. ✖ Greater than

3. ✔ Smaller than

4. ✖ Some times greater and some times smaller than

Question Number : 57 Question Id : 41809919259 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A body is thrown horizontally from the top of a tower of 20 m height. It touches the ground at a distance of 10 m from the foot of the tower. The initial velocity of the body is($g=10ms^{-2}$)

Options :

1. ✖ $2.5\ ms^{-1}$

2. ✔ $5\ ms^{-1}$

3. ✖ $10\ ms^{-1}$

4. ✖ $20\ ms^{-1}$

Question Number : 58 Question Id : 41809919260 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 10 Newton force is applied on a body produce in it an acceleration of $2\ ms^{-2}$. The mass of the body is given by

Options :

1. ✖ 15 kg

2. ✖ 20 kg

3. ✖ 10 kg

4. ✔ 5 kg

Question Number : 59 Question Id : 41809919261 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The horizontal range and maximum height of a projectile are equal. The angle of projection of particle is given by

Options :

1. ✔ $\theta = \tan^{-1} 4$

2. ✖ $\theta = \tan^{-1}(1/4)$

3. ✖ $\theta = \tan^{-1} 2$

4. ✖ $\theta = 45^0$

Question Number : 60 Question Id : 41809919262 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The displacement of a particle moving in a straight line is given by

$x=2t^2+t+5$, where x is expressed in meter and t in seconds. The acceleration

at t=2s is

Options :

1. ✖ $10ms^{-2}$

2. ✖ $8ms^{-2}$

3. ✔ $4ms^{-2}$

4. ✖ $15ms^{-2}$

Question Number : 61 Question Id : 41809919263 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A position-dependant force, $F = 8 – 4x + 3x^2$ N acts on a body of mass 2 kg,

and displaces it from x = 0 to x = 5 m. The work done is

Options :

1. ✔ 115 J

2. ✖ 110 J

3. ✖ 250 J

4. ✖ 270 J

Question Number : 62 Question Id : 41809919264 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An object of mass 5 kg falls from rest through a vertical distance of 20 m and attains a velocity of 10 ms^{-1}. How much work is done by the resistance of air on the object? (Consider acceleration due to gravity, g= 10 ms^{-2}).

Options :

1. ✖ -250 J

2. ✔ -750 J

3. ✖ -500 J

4. ✖ -300 J

Question Number : 63 Question Id : 41809919265 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the heart pushes 1 cc of blood in one second under pressure 19500 Nm^{-2}, the power of heart is

Options :

1. ✔ 0.0195 W

2. ✖ 0.1950 W

3. ✖ 19.50 W

4. ✖ 9.50 W

Question Number : 64 Question Id : 41809919266 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a necessary condition for simple harmonic motion?

Options :

1. ✖ proportionality between acceleration and velocity

2. ✔ proportionality between restoring force and displacement

3. ✖ constant time period

4. ✖ constant acceleration

Question Number : 65 Question Id : 41809919267 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The phase, at a given time 't', of a particle undergoing simple harmonic motion describes

Options :

1. ✖ only the direction of motion of the particle at time t

2. ✖ only the position of the particle at time t

3. ✔ both the position and direction of the particle at time t

4. ✖ only about the wavelength of the particle at time t

Question Number : 66 Question Id : 41809919268 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of a second's pendulum at the surface of the earth is

Options :

1. ✔ 100 cm

2. ✖ 98 cm

3. ✖ 98 m

4. ✖ 100 m

Question Number : 67 Question Id : 41809919269 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The reverberation time of a room is one second. What will be the reverberation time for another room having all the dimensions double that of the first room

Options :

1. ✖ $\frac{1}{2}$ Sec

2. ✔ 2 Sec

3. ✖ $\frac{1}{4}$ Sec

4. ✖ 4 Sec

Question Number : 68 Question Id : 41809919270 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Calculate the beat frequency if the interfering wave frequencies are 500Hz and 1000Hz respectively.

Options :

1. ✖ 1500 Hz

2. ✖ 250 Hz

3. ✖ 750 Hz

4. ✔ 500 Hz

Question Number : 69 Question Id : 41809919271 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Every gas behaves as an ideal gas at

Options :

1. ✖ high temperature and high pressure

2. ✖ Low temperature and low pressure

3. ✔ High temperature and low pressure

4. ✖

High pressure and low temperature

Question Number : 70 Question Id : 41809919272 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A perfect Carnot engine utilizes an ideal gas and works between the temperatures 227°C and 127°C. If the work output of the engines is 10^4 J, then the amount of heat received from the source will be

Options :

1. ✖ $1x10^4 J$

2. ✖ $3x10^4 J$

3. ✔ $5x10^4 J$

4. ✖ $4x10^4 J$

Question Number : 71 Question Id : 41809919273 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an adiabatic process of an ideal gas, the value of $\frac{dp}{p}$ is equal to

Options :

1. ✔

$-\gamma\frac{dv}{v}$

2. ✖ $-\gamma\frac{v}{dv}$

3. ✖ $\frac{dv}{v}$

4. ✖ $-\gamma^2\frac{dv}{v}$

Question Number : 72 Question Id : 41809919274 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A system is given 400 calories of heat and 1000 joule of work is done by the system, then the change in internal energy of the system will be

Options :

1. ✔ 680 Joule

2. ✖ 680 erg

3. ✖ 860 Joule

4. ✖

-860 Joule

Question Number : 73 Question Id : 41809919275 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A perfect gas at 27°c is heated at constant pressure, so as to triple its volume. The temperature of the gas is

Options :

1. ✖ 627 K

2. ✔ 900 K

3. ✖ 300 K

4. ✖ 427 K

Question Number : 74 Question Id : 41809919276 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Work function of a metal is 10 eV. Photons of 20 eV are bombarded on it. The photoelectric threshold frequency will be

Options :

1. ✔ equal to $\frac{10}{h}$

2. ✖ greater than $\frac{10}{h}$

3. ✖ less than $\frac{10}{h}$

4. ✖ greater than or equal to $\frac{10}{h}$

Question Number : 75 Question Id : 41809919277 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Superconducting material exhibits

Options :

1. ✖ zero conductivity & diamagnetism

2. ✖ zero resistivity & paramagnetism

3. ✖ infinite conductivity & paramagnetism

4. ✔ zero resistivity & diamagnetism

Chemistry

Section Id :	418099386
Section Number :	3
Mandatory or Optional :	Mandatory
Number of Questions :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 76 Question Id : 41809919278 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a hydrogen atom, if the energy of an electron in the ground state is 13.6 eV, then that in the 2nd excited state is

Options :

1. ✔ 1.51 eV

2. ✖ 3.02 eV

3. ✖ 6.04 eV

4. ✖ 1.36 eV

Question Number : 77 Question Id : 41809919279 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following sets of quantum numbers is correct for an electron present in 4f orbital?

Options :

1. ✖ $n = 4, l = 4, m = -4, s = -½$

2. ✖ $n = 3, l = 2, m = -2, s = +½$

3. ✖ $n = 4, l = 3, m = +4, s = -½$

4. ✔ $n = 4, l = 3, m = +1, s = +½$

Question Number : 78 Question Id : 41809919280 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following statements in relation to the hydrogen atom is true?

Options :

1. ✖ 3s and 3p orbitals are of lower energy than 3d orbital

2. ✔ 3s, 3p and 3d orbitals all have the same energy

3. ✖ 3p orbital is lower in energy than 3d orbital

4. ✖ 3s orbital is lower in energy than 3p orbital

Question Number : 79 Question Id : 41809919281 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Variable valency is shown by

Options :

1. ✖ s-block elements

2. ✖ s- and p- block elements

3. ✔ p- and d-block elements

4. ✖ All elements

Question Number : 80 Question Id : 41809919282 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The compound in which C uses its sp^3 hybrid orbitals for bond formation is

Options :

1. ✔ $(CH_3)_3CH$

2. ✖ CH_3COOH

3. ✖ CH_3CHO

4. ✖ CH_3COCH_3

Question Number : 81 Question Id : 41809919283 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The concentrated sulphuric acid that is sold commercially is 95% H_2SO_4 by weight. If the density of this commercial acid is 1.83 g cm^{-3}, the molarity of this solution is :-

Options :

1. ✖ 8.9

2. ✖ 9.8

3. ✖ 19.6

4. ✔ 18.3

Question Number : 82 Question Id : 41809919284 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The density of a solution prepared by dissolving 100 g of urea (mol. mass = 60 u) in 1000 g of water is 1.15 g/mL. The molarity of this solution is

Options :

1. ✖ 2.04

2. ✖ 1.68

3. ✖ 0.92

4. ✔ 1.73

Question Number : 83 Question Id : 41809919285 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a crystal of a solute is introduced into a super saturated solution of the solution, which of the following is true

Options :

1. ✖ The solution becomes unsaturated

2. ✔ The excess solute crystallizes out

3. ✖ The solute dissolves

4. ✖ The solution becomes saturated

Question Number : 84 Question Id : 41809919286 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The conjugate acid of $S_2O_8^{2-}$ is

Options :

1. ✖ H_2SO_4

2. ✖ $H_2S_2O_7$

3. ✔ $HS_2O_8^-$

4. ✖ $H_2S_2O_8$

Question Number : 85 Question Id : 41809919287 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following gases on dissolution in water make the solution acidic (A) CO (B) CO_2 (C) SO_3 (D) PH_3

Options :

1. ✖ (A) and (B)

2. ✔ (B) and (C)

3. ✖ (A) and (D)

4. ✖ (C) and (D)

Question Number : 86 Question Id : 41809919288 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

On electrolysing a solution of dilute H_2SO_4 between platinum electrodes, the gas evolved at the anode and cathode are respectively

Options :

1. ✖ SO_2 and O_2

2. ✖ SO_3 and H_2

3. ✔ O_2 and H_2

4. ✖ H_2 and O_2

Question Number : 87 Question Id : 41809919289 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an electrolytic cell, flow of electrons is from

Options :

1. ✖ cathode to anode in solution

2. ✔ cathode to anode through external supply

3. ✖ cathode to anode through internal supply

4. ✖ anode to cathode through external supply

Question Number : 88 Question Id : 41809919290 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermodynamic efficiency of a cell is given by

Options :

1. ✔ $nFE/\Delta H$

2. ✖ $\Delta H/\Delta G$

3. ✖ $nFE/\Delta G$

4. ✖ nFE°

Question Number : 89 Question Id : 41809919291 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At 25 °C, the standard e.m.f. of cell having reactions involving two electron change is found to be 0.295 V. The equilibrium constant of the reaction is

Options :

1. ✖ 29.5×10^{-2}

2. ✖ 10

3. ✔ 10^{10}

4. ✖ 29.5×10^{10}

Question Number : 90 Question Id : 41809919292 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the chemical formula of Calgon

Options :

1. ✔ $[Na(PO)_3]_6$

2. ✖ $[Ca_2(P_6O_{18})]^{2-}$

3. ✖ H_2CO_3

4. ✖ $Na_2CO_3+Ca(OH)_2$

Question Number : 91 Question Id : 41809919293 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Alkalinity of water is due to the presence of _____

(A) OH^- (B) CO_3^{2-} (C) HCO_3^-

Options :

1. ✖ Only (A)

2. ✖ Both (A) and (B)

3. ✖ Both (B) and (C)

4. ✔ All the three (A), (B) and (C)

Question Number : 92 Question Id : 41809919294 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brackish water means

Options :

1. ✖ Ground water

2. ✖ Fresh Water

3. ✖ River Water

4. ✔ Salt Water

Question Number : 93 Question Id : 41809919295 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following two metals are corrosion resistant

Options :

1. ✖ Iron and Nickel

2. ✔ Nickel and Copper

3. ✖ Copper and Molybdenum

4. ✖ Iron and Molybdenum

Question Number : 94 Question Id : 41809919296 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coating which protects the base metal 'sacrificially' is

Options :

1. ✖ Metallic coating

2. ✔ Anodic coating

3. ✖

Metal oxide coating

4. ✖ Phosphate coating

Question Number : 95 Question Id : 41809919297 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is also known as elastomers

Options :

1. ✖ PVC

2. ✖ Nylon 6,6

3. ✔ Synthetic rubber

4. ✖ Polycarbonate

Question Number : 96 Question Id : 41809919298 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an inorganic polymer?

Options :

1. ✔ Silicone

2. ✖

Epoxy resin

3. ✖ Polyurethane

4. ✖ Teflon

Question Number : 97 Question Id : 41809919299 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The termination step in the cationic polymerization is caused by

Options :

1. ✖ Free radical

2. ✖ cation

3. ✔ anion

4. ✖ carbene

Question Number : 98 Question Id : 41809919300 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sulphur compounds from gasoline are removed by

Options :

1. ✖ Lead sulphate

2. ✖ Lead nitrate

3. ✖ Lead sulphide

4. ✔ Sodium plumbite

Question Number : 99 Question Id : 41809919301 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fluoride pollution mainly affects

Options :

1. ✔ Teeth

2. ✖ Heart

3. ✖ Kidneys

4. ✖ Liver

Question Number : 100 Question Id : 41809919302 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Silicosis is caused by

Options :

1. ✖ Acid rain

2. ✔ Inhalation of aerosols

3. ✖ Inhalation of sulphurdioxide

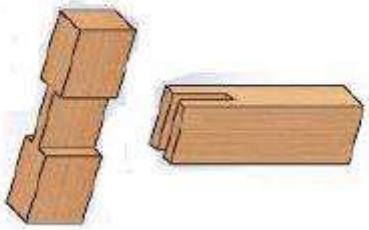
4. ✖ Depletion of ozone

Mechanical Engineering

Section Id :	418099387
Section Number :	4
Mandatory or Optional :	Mandatory
Number of Questions :	100
Section Marks :	100
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 101 Question Id : 41809919303 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following wood working (Carpentry) joint is known as:



Options :

1. ✖ Tee-halving joint

2. ✖ Cross halving joint

3. ✔ Tee-bridle joint

4. ✖ Bar faced tenon joint

Question Number : 102 Question Id : 41809919304 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following tools is not used in fitting operations of metals:

Options :

1. ✖ Scraper

2. ✖ Scriber

Prick Punch

3. ✖

Snips

4. ✔

Question Number : 103 Question Id : 41809919305 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sheet metal worker's anvils used for bending or forming using a mallet are called:

Options :

Stakes

1. ✔

Groovers

2. ✖

Pin vice

3. ✖

Shears.

4. ✖

Question Number : 104 Question Id : 41809919306 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A solid cylinder of diameter 100 mm and height 49 mm is forged between two friction-less flat dies to a height of 25 mm. The new diameter of the cylinder is:

Options :

1. ✖ 125 mm

2. ✔ 140 mm

3. ✖ 169 mm

4. ✖ 196 mm

Question Number : 105 Question Id : 41809919307 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following property is not improved by cold working of metals:

Options :

1. ✖ Hardness

2. ✖ Surface finish

3. ✖ Toughness

4. ✔ Corrosion resistance

Question Number : 106 Question Id : 41809919308 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The tool used to remove the loose piece of a loose-piece pattern from the mould is known as:

Options :

1. ✔ Skewer

2. ✖ Slick

3. ✖ Swab

4. ✖ Trowel

Question Number : 107 Question Id : 41809919309 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a property of a moulding sand:

Options :

1. ✖ Permeability

2. ✖ Collapsibility

3. ✖ Cohesiveness

4. ✔ Fluidity

Question Number : 108 Question Id : 41809919310 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The external defect formed due to imperfect fusion of two streams of molten metal in the moulding cavity is known as:

Options :

1. ✖ Swell

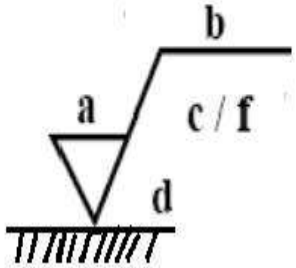
2. ✖ Misrun

3. ✔ Cold Shut

4. ✖ Blow Hole

Question Number : 109 Question Id : 41809919311 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the specification of surface roughness symbol shown below, the letter 'c' refers to:



Options :

1. ✖ Direction of lay

2. ✖ Manufacturing allowance

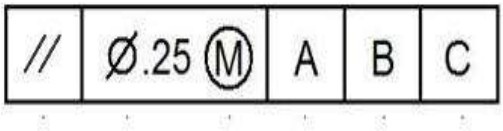
3. ✖ Roughness value

4. ✔ Sampling length

Question Number : 110 Question Id : 41809919312 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The notation or representation for tolerance of form and position is shown in figure below.

The tolerance symbol ' // ' refers to:



Options :

1. ✖ Flatness

2. ✖ Straightness

3. ✔ Parallalism

4. ✖ Symmetry

Question Number : 111 Question Id : 41809919313 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A shaft of diameter $20^{+0.05}_{-0.10}$ mm and a hole of diameter $20^{+0.20}_{+0.10}$ mm. when assembled would yield:

Options :

1. ✔ Clearance fit

2. ✖ Transition fit

3. ✖ Interference fit

4. ✖ Push fit

Question Number : 112 Question Id : 41809919314 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The symbol '  ' used in machine drawing, refers to:

Options :

1. ✖ Depth

2. ✖ Counterbore

3. ✔ Countersink

4. ✖ Conical taper

Question Number : 113 Question Id : 41809919315 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which of the following welding process electrode in coil form is used:

Options :

1. ✖ Tungten Inert Gas Welding (TIG)

2. ✔ Metal Inert Gas Welding (MIG)

3. ✖ Stud Welding

4. ✖ Plasma Arc Welding

Question Number : 114 Question Id : 41809919316 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For which of the following metal Oxidizing flame is used during oxy-acetylene gas welding.

Options :

1. ✔ Brass

2. ✖ Cast Iron

Aluminium

3. ✖

Lead

4. ✖

Question Number : 115 Question Id : 41809919317 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an example of solid state welding?

Options :

Electron beam

1. ✖

LASER Beam Welding

2. ✖

Ultrasonic welding

3. ✔

Thermit welding.

4. ✖

Question Number : 116 Question Id : 41809919318 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During welding process, a groove is formed in the parent metal at the toe of the weld pass i.e., along the side of the weld bead. This weld defect is called;

Options :

1. ✖ Distortion

2. ✖ Porosity

3. ✖ Spatter

4. ✔ Undercut.

Question Number : 117 Question Id : 41809919319 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The non-cutting operation that can be performed on Lathe is:

Options :

1. ✖ Grooving

2. ✖ Boring

3. ✖ Facing

4. ✔ Spinning

Question Number : 118 Question Id : 41809919320 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A wedge shape tool is used for removing the taper shank from the nose of the drilling machine spindle, and is known as:

Options :

1. ✔ Drill Drift

2. ✖ Drill Chuck

3. ✖ Drill Socket

4. ✖ Drill Key

Question Number : 119 Question Id : 41809919321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During machining operation, Shaper machine tool uses the following mechanism:

Options :

1. ✖ Geneva Mechanism

2. ✔ Crank and Slotted Lever Mechanism

3. ✖ Ratchet Mechanism

4. ✖ Peaucellier Mechanism

Question Number : 120 Question Id : 41809919322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A milling operation in which two cutters are mounted on the same arbor to machine two parallel vertical surfaces simultaneously, is called:

Options :

1. ✖ End milling

2. ✖ Gang milling

3. ✔ Straddle milling

4. ✖ Salb milling

Question Number : 121 Question Id : 41809919323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Jigs and Fixtures, 3-2-1 method of location arrests or restricts the work piece in

_____ degrees of freedom.

Options :

1. ✖ 7

2. ✔ 5

3. ✖ 8

4. ✖ 6

Question Number : 122 Question Id : 41809919324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following material cannot be machined by using Electric Discharge

Machining:

Options :

1. ✖ Steel

2. ✖ Titanium

3. ✖

Copper

Glass

4. ✔

Question Number : 123 Question Id : 41809919325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The surface finishing operation in which two surfaces are rubbed together with a loose abrasives between them by a machine, is known as:

Options :

1. ✔ Lapping

2. ✖ Honing

3. ✖ Rumbling

4. ✖ Tumbling

Question Number : 124 Question Id : 41809919326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With reference to the Part program on CNC Lathe; Code M08 refers to:

Options :

1. ✖ Spindle On

2. ✖ Spindle off

3. ✔ Coolant on

4. ✖ Coolant off

Question Number : 125 Question Id : 41809919327 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Robot co-ordinate system, which has two linear and one rotational motion, is called:

Options :

1. ✔ Cylindrical co-ordinate system

2. ✖ Polar co-ordinate system

3. ✖ Spherical co-ordinate system

4. ✖ Cartesian co-ordinate system

Question Number : 126 Question Id : 41809919328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Flexible Manufacturing Systems, AGV stands for:

Options :

1. ✖ Auto Gas Vehicle

2. ✔ Automated Guided Vehicle

3. ✖ Automatic Gauge Vehicle

4. ✖ Advanced Garage vehicle

Question Number : 127 Question Id : 41809919329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a Rapid Prototyping Technique used in manufacturing:

Options :

1. ✖ Fused Deposition Method (FDM)

2. ✖ Stereo-lithography (SLA)

3. ✖ Selective Laser Sintering (SLS)

4. ✔ Finite Volume Method (FVM)

Question Number : 128 Question Id : 41809919330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ability of a material to resist fracture due to impact load is known as:

Options :

1. ✔ Toughness

2. ✖ Stiffness

3. ✖ Hardness

4. ✖ Fatigue

Question Number : 129 Question Id : 41809919331 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a non-destructive testing method:

Options :

1. ✖

Ultrasonic

2. ✖ Eddy current

3. ✖ Dye penetration

4. ✔ Fatigue

Question Number : 130 Question Id : 41809919332 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Blast furnace is used to produce:

Options :

1. ✖ Cast Iron

2. ✖ Wrought Iron

3. ✔ Pig Iron

4. ✖ Steel

Question Number : 131 Question Id : 41809919333 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Eutectic reaction for Iron - Carbon system occurs at:

Options :

1. ✖ $600^0\ C$

2. ✔ $723^0\ C$

3. ✖ $1147^0\ C$

4. ✖ $1493^0\ C$

Question Number : 132 Question Id : 41809919334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process of inducing carbon to low carbon steel to get a hard surface, is known as:

Options :

1. ✔ Carburising

2. ✖ Cyaniding

3. ✖ Nitriding

Tempering

4. ✖

Question Number : 133 Question Id : 41809919335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

18-4-1 High speed steel contains 18%, 4% and 1% respectively of

Options :

Chromium, tungsten and vanadium

1. ✖

Tungsten, chromium and vanadium

2. ✔

Vanadium, chromium and tungsten

3. ✖

Tungsten, vanadium and chromium

4. ✖

Question Number : 134 Question Id : 41809919336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

"If three coplanar forces acting at a point are in equilibrium, then each force is

proportional to the sine of angle between the other two" - is known as :

Options :

1. ✖

Law of transmissibility

2. ✖ Verignon's theorm

3. ✔ Lame's theorm

4. ✖ Parallelogram law of forces

Question Number : 135 Question Id : 41809919337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a self-locking machine, the efficiency (η) should be

Options :

1. ✖ $\eta > 70\,\%$

2. ✖ $60\,\% < \eta \leq 70\%$

3. ✖ $50\,\% < \eta \leq 60\%$

4. ✔ $\eta \leq 50\%$

Question Number : 136 Question Id : 41809919338 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the value of Poisson's ratio of a material is 0.5, then the ratio of Elastic modulus to

Shear modulus is:

Options :

1. ✖ Four

2. ✔ Three

3. ✖ Two

4. ✖ One

Question Number : 137 Question Id : 41809919339 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bending moment diagram, for a cantilever beam carrying uniformly distributed load

over the entire length, is:

Options :

1. ✖ Rectangle

2. ✖ Triangle

3. ✔ Parabola

4. ✖ Hyperbola

Question Number : 138 Question Id : 41809919340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cantilever beam of length L, Moment of inertia I, Modulus of elasticity E, carries a concentrated load W at the middle of its length. The slope of the cantilever at the free end is :

Options :

1. ✖ $\frac{W L^2}{2 E I}$

2. ✖ $\frac{W L^2}{4 E I}$

3. ✖ $\frac{W L^2}{6 E I}$

4. ✔ $\frac{W L^2}{8 E I}$

Question Number : 139 Question Id : 41809919341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

A solid circular shaft has been subjected to a pure torsion moment. The ratio of maximum shear stress to maximum normal stress at any point is:

Options :

1. ✖ 1:2

2. ✖ 2:3

3. ✔ 1:1

4. ✖ 2:1

Question Number : 140 Question Id : 41809919342 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a belt drive, diameter of the driving pulley is 396 mm and speed is 200 r.p.m. Belt thickness is 4 mm and the total slip in the drive is 2%. If the speed of the driven pulley is 100 r.p.m then its diameter is:

Options :

1. ✖ 764 mm

2. ✔ 780 mm

3. ✖ 784 mm

4. ✖ 792 mm

Question Number : 141 Question Id : 41809919343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If Cs is the coefficient of fluctuation of speed of a flywheel, then the ratio of Maximum speed to the Minimum speed of flywheel is:

Options :

1. ✖ $\frac{(1+2\,Cs)}{(1-2\,Cs)}$

2. ✖ $\frac{(1-2\,Cs)}{(1+2\,Cs)}$

3. ✔ $\frac{(2+\,Cs)}{(2-\,Cs)}$

4. ✖ $\frac{(2-\,Cs)}{(2+\,Cs)}$

Question Number : 142 Question Id : 41809919344 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An Internal spur gear having 120 teeth is in contact with another spur gear of 40 teeth. If the module is 6 mm; then the center to center distance between the gears is:

Options :

1. ✔ 240 mm

2. ✖ 480 mm

3. ✖ 800 mm

4. ✖ 960 mm.

Question Number : 143 Question Id : 41809919345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the ball mass of a governor occupies a definite specified position for each speed in the working range, then it is said to be:

Options :

1. ✔ Stable

2. ✖ Isochronism

3. ✖ Sensitive

Insensitive

4. ✖

Question Number : 144 Question Id : 41809919346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a cam and follower displacement motion:

Options :

Simple harmonic motion

1. ✖

Cycloidal motion

2. ✖

Uniform acceleration and retardation motion

3. ✖

Involute motion

4. ✔

Question Number : 145 Question Id : 41809919347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to Unwin's formula, the relationship between the diameter of the rivet (d) and thickness of the plate (t) is given by:

Options :

1.

✖ $d = \sqrt{t}$

2. ✖ $d = 1.6\sqrt{t}$

3. ✖ $d = 5\sqrt{t}$

4. ✔ $d = 6\sqrt{t}$

Question Number : 146 Question Id : 41809919348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a fillet weld, the ratio of throat to leg of weld is:

Options :

1. ✖ $\frac{1}{2}$

2. ✔ $\frac{1}{\sqrt{2}}$

3. ✖ $\sqrt{2}$

4. ✖ 2.0

Question Number : 147 Question Id : 41809919349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a material of key and shaft is same, and width of square key is one-fourth of the diameter of the shaft, 'd'; then the length of the key is:

Options :

1. ✖ $\frac{\pi d}{4}$

2. ✖ $\frac{\pi d}{3}$

3. ✔ $\frac{\pi d}{2}$

4. ✖ π d.

Question Number : 148 Question Id : 41809919350 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The pitch circle dimeter of bolts of a flange coupling is given in terms of diameter of shaft d as

Options :

1. ✖ 2 d

2. ✔ 3 d

3. ✖ 4 d

4. ✖ 5 d

Question Number : 149 Question Id : 41809919351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the load on the ball bearing is reduced to half, the life of the ball bearing will increase :

Options :

1. ✖ Two times

2. ✖ four times

3. ✖ Six times

4. ✔ Eight times

Question Number : 150 Question Id : 41809919352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A close coiled helical spring having stiffness 'K' is cut into two equal halves, then the stiffness of the resulting each spring is:

Options :

1. ✖ 3K

2. ✔ 2K

3. ✖ K

4. ✖ K/2

Question Number : 151 Question Id : 41809919353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an atmospheric air , $\frac{C_p}{C_v}$ is equal to:

(C_p = Specific heat at constant pressure and C_v = Specific heat at constant volume)

Options :

1. ✖ 1.1

2. ✖ 1.2

3. ✖ 1.3

4. ✔ 1.4

Question Number : 152 Question Id : 41809919354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a polytropic process equation (for perfect gas) $p\,v^n = C$, if $n = 1$, the process is termed as:

Options :

1. ✖ Constant volume

2. ✖ Constant pressure

3. ✔ Constant temperature

4. ✖ Adiabatic

Question Number : 153 Question Id : 41809919355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an example for a closed system (thermodynamic point of view)

Options :

1. ✖ Scooter engine

2. ✖ Centrifugal pump

3. ✖ Gas turbine

4. ✔ Car battery.

Question Number : 154 Question Id : 41809919356 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The lowest temperature at which the fuel vapors keep burning even after the ignition source is removed is called:

Options :

1. ✖ Flash point

2. ✔ Fire point

3. ✖ Pour point

4. ✖ Cloud point

Question Number : 155 Question Id : 41809919357 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the given same maximum pressure and maximum temperature, the efficiencies of otto, diesel and dual combustion cycle are in the order:

Options :

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

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

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

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

Question Number : 156 Question Id : 41809919358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The air standard cycle involving constant pressure heat addition and constant volume heat rejection refers to the:

Options :

1. ✔ Diesel cycle

2. ✖ Otto cycle

3. ✖ Atkinson cycle

4. ✖ Brayton cycle

Question Number : 157 Question Id : 41809919359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is the correct sequence of four strokes in an internal combustion engine:

Options :

1. ✖ Suction, expansion, exhaust, compression

2. ✖ Compression, expansion, suction, exhaust

3. ✔ Suction, compression, expansion, exhaust

4. ✖ Suction, expansion, compression, exhaust

Question Number : 158 Question Id : 41809919360 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

To evaluate the performance of an Internal Combustion engine, the Brake Power an engine is measured by using:

Options :

1. ✖ Tachometer

2. ✔ Dynamometer

3. ✖ Rotometer

4. ✖ Odometer

Question Number : 159 Question Id : 41809919361 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The frictional power of an Internal combustion engine can not be determined by the following method:

Options :

1. ✖ Morse test

2. ✖ Willan's line method

3. ✖

Motoring test

Cooling curve test

4. ✔

Question Number : 160 Question Id : 41809919362 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With reference to reciprocating single stage air compressor, the clearance ratio is :

Options :

$$\frac{Clearance\ volume}{Swept\ volume}$$

1. ✔

$$\frac{Effective\ Swept\ volume}{Swept\ volume}$$

2. ✖

$$\frac{Swept\ volume}{Effective\ Swept\ volume}$$

3. ✖

$$\frac{Swept\ volume}{Clearance\ volume}$$

4. ✖

Question Number : 161 Question Id : 41809919363 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a method employed to improve the thermal efficiency of open type gas turbine cycle:

Options :

1. ✖ Intercooling

2. ✖ Reheating

3. ✖ Regeneration

4. ✔ Aftercooling

Question Number : 162 Question Id : 41809919364 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The basic thermodynamic cycle for the turbo-jet engine is:

Options :

1. ✖ Diesel cycle

2. ✖ Duel cycle

3. ✔ Brayton cycle

Rankine cycle

4. ✖

Question Number : 163 Question Id : 41809919365 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The property of a liquid which offers resistance to the movement of one layer of liquid over another adjacent layer of liquid, is called:

Options :

Surface tension

1. ✖

Capillarity

2. ✖

Compressibility

3. ✖

Viscosity

4. ✔

Question Number : 164 Question Id : 41809919366 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a fluid flows through a tapering pipe at a constantly increasing rate, the flow is classified as:

Options :

Steady Uniform flow

1. ✖

Unsteady Uniform flow

2. ✖

Unsteady Non-uniform flow

3. ✔

Steady Non-uniform flow

4. ✖

Question Number : 165 Question Id : 41809919367 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of inertia force of a flowing fluid and the viscous force of the fluid is known as:

Options :

Reynold's number

1. ✔

Froude's number

2. ✖

Euler's number

3. ✖

Mach Number

4. ✖

Question Number : 166 Question Id : 41809919368 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A jet of water coming from a nozzle with a velocity of 20 m/sec and it impinges normally on a flat plate moving away from it at 10 m /sec. If the cross-sectional area of the jet is 0.01 m^2 and the density of water is taken as 1000 kg / m^3, then the force developed on the plate is:

Options :

1. ✖ 2000 N

2. ✔ 1000 N

3. ✖ 500 N

4. ✖ 100 N

Question Number : 167 Question Id : 41809919369 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following hydraulic turbine fitted with adjustable vanes:

Options :

1. ✔ Kaplan

2. ✖

Pelton

Francis

3. ✖

Propeller

4. ✖

Question Number : 168 Question Id : 41809919370 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of maximum Hydraulic Efficiency of Pelton Wheel (turbine) is given by:

β = The angle of deflection of jet through buckets

Options :

1. ✖ $(1 + \cos\beta)$

2. ✖ $(1 - \cos\beta)$

3. ✔ $\frac{(1 + \cos\beta)}{2}$

4. ✖ $\frac{(1 - \cos\beta)}{2}$

Question Number : 169 Question Id : 41809919371 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is the effect of cavitation in centrifugal pump:

Options :

1. ✔ Sudden drop in efficiency

2. ✖ Hydraulic Ram

3. ✖ Surging

4. ✖ Hydraulic Intensifier

Question Number : 170 Question Id : 41809919372 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a single acting reciprocating pump fitted with air vessel, the crank angle position where there is no flow of liquid into or from the air vessel is:

Options :

1. ✖ 0^0

2. ✔ 18.57^0

3. ✖ 39.53^0

4. ✖ 45^0

Question Number : 171 Question Id : 41809919373 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The actuator, which converts energy in the form of compressed air into movement, is known as:

Options :

1. ✖ Electro- magnetic Actuator

2. ✖ Hydraulic Actuator

3. ✔ Pneumatic Actuator

4. ✖ Electric Actuator

Question Number : 172 Question Id : 41809919374 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The dryness fraction (quality) of steam which has 10 kg of water in suspension with 40 kg of steam is:

Options :

1. ✖ 0.2

2. ✖ 0.25

3. ✖ 0.75

4. ✔ 0.8

Question Number : 173 Question Id : 41809919375 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

On Mollier chart for steam, the throttling process, is represented by a:

Options :

1. ✔ Horizontal line

2. ✖ Vertical line

3. ✖ Downward inclined line (from left to right)

4. ✖ Upward inclined line (from left to right)

Question Number : 174 Question Id : 41809919376 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is water bent tube boiler?

Options :

1. ✖ Locomotive boiler

2. ✖ Lancashire boiler

3. ✖ Cochran boiler

4. ✔ Stirling boiler

Question Number : 175 Question Id : 41809919377 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is not a boiler mounting?

Options :

1. ✖ Blow-off clock

2. ✖ Feed check valve

3. ✖ Fusible plug

Economiser

4. ✔

Question Number : 176 Question Id : 41809919378 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In steam boilers, a device in which the waste heat of the flue gases is utilized for heating the feed water, is:

Options :

1. ✔ Economiser

2. ✖ Super heater

3. ✖ Stream trap

4. ✖ Injector

Question Number : 177 Question Id : 41809919379 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Isentropic expansion of a steam through nozzle for the steam initially superheated at the inlet is approximated by an equation:

Options :

1. ✖ $pv^{1.4} = C$

2. ✔ $pv^{1.3} = C$

3. ✖ $pv^{1.135} = C$

4. ✖ $pv^{1.25} = C$

Question Number : 178 Question Id : 41809919380 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The compounding of a steam turbine is done to:

Options :

1. ✖ Improve efficiency

2. ✔ Reduce the turbine speed

3. ✖ Reduce axial thrust

4. ✖ Reduce the exit losses

Question Number : 179 Question Id : 41809919381 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Parson's reaction turbine the velocity diagram triangles at the inlet and outlet are:

Options :

1. ✖ Right angled

2. ✖ Isosceless

3. ✖ Asymmetrical

4. ✔ Congruent

Question Number : 180 Question Id : 41809919382 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the enthalpy drops of moving blade and fixed blade of a stage in a reaction steam turbine are 9 and 11 kJ/kg respectively, then the Degree of reaction of the stage is:

Options :

1. ✖ 55%

2. ✔ 45%

3. ✖

35%

25%

4. ✖

Question Number : 181 Question Id : 41809919383 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The effect of air leakage in the steam condenser of a power plant is

Options :

1. ✖ To enhance the efficiency

2. ✔ To increase the condenser pressure

3. ✖ To increase the dryness fraction

To increase the vacuum

4. ✖

Question Number : 182 Question Id : 41809919384 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A heat pump working on a reversed Carnot cycle has a COP of 5. If works as a refrigerator taking 1.2 kW of work input, the refrigerating effect is:

Options :

1. ✖ 7.2 kW

2. ✖ 6.0 kW

3. ✔ 4.8 kW

4. ✖ 3.6 kW

Question Number : 183 Question Id : 41809919385 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an absorption type refrigeration system, heating, cooling and refrigeration takes place at the temperatures of 127 ^{0}C, 27 ^{0}C and -23 ^{0}C respectively. The theoretical COP of the system is:

Options :

1. ✔ 1.25

2. ✖ 2.50

3. ✖ 3.75

4. ✖ 4.0

Question Number : 184 Question Id : 41809919386 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In vapour absorption refrigeration system, the function of a rectifier is:

Options :

1. ✔ To cool the vapour leaving the analyzer

2. ✖ To condense the ammonia vapour

3. ✖ To dissolve Ammonia in Water

4. ✖ To heat the vapour leaving the analyzer

Question Number : 185 Question Id : 41809919387 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following process is used in winter air-conditioning?

Options :

1. ✔ Heating and humidification

2. ✖ Heating and dehumidification

3. ✖ Only heating

4. ✖ Cooling and dehumidification.

Question Number : 186 Question Id : 41809919388 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When only sensible heat is added to a sample of air, the process is represented on the Psychrometric chart as a:

Options :

1. ✖ Horizontal line moving towards left direction

2. ✖ Vertical line moving towards upward direction

3. ✔ Horizontal line moving towards right direction

4. ✖ Vertical line moving towards downward direction

Question Number : 187 Question Id : 41809919389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In work study, what does the symbol '□' represent?

Options :

1. ✔ Inspection

2. ✖ Operation

3. ✖ Delay

4. ✖ Transportation.

Question Number : 188 Question Id : 41809919390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following mathematical distribution is used in p-chart:

Options :

1. ✖ Normal

2. ✔ Binomial

3. ✖ Poisson

4. ✖ Exponential

Question Number : 189 Question Id : 41809919391 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A diagram showing the path followed by man and materials while performing a task is known as:

Options :

1. ✖ String diagram

2. ✔ Flow process chart

3. ✖ Travel chart

4. ✖ Scheduling diagram

Question Number : 190 Question Id : 41809919392 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a ship vessel manufacturing industry, which of the following plant lay-out is suitable:

Options :

1. ✖ Process lay-out

2. ✖ Product lay-out

3. ✔ Fixed position lay-out

4. ✖ Combination lay-out

Question Number : 191 Question Id : 41809919393 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following organization is preferred in Automobile Industry:

Options :

1. ✖ Line organization

2. ✖ Functional organization

3. ✔ Line and staff organization

4. ✖ Line, staff and functional organization.

Question Number : 192 Question Id : 41809919394 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Economic Order Quantity (EOQ) is the quantity at which the cost of carrying is:

Options :

1. ✔ Equal to the cost of ordering

2. ✖ Less than the cost of ordering

3. ✖ Maximum

4. ✖ Cost of over-stocking.

Question Number : 193 Question Id : 41809919395 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The type of safety sign symbol, "Red circle with a red slash over a black icon" refers to :

Options :

1. ✔ Prohibition sign

2. ✖ Mandatory sign

3. ✖ Warning sign

4. ✖ Emergency sign

Question Number : 194 Question Id : 41809919396 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In ISO-9000 quality management, ISO means:

Options :

1. ✖ Indian Organization for Security and Safety

2. ✖ International Safety Organization

3. ✖ Indian Standards Organization

4. ✔ International Organization for Standardization

Question Number : 195 Question Id : 41809919397 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The vertical angle made by the Sun's rays with a normal to a horizontal surface, is called:

Options :

1. ✖ Altitude angle

2. ✖ Hour angle

Surface Azimuth angle

3. ✖

Zenith angle

4. ✔

Question Number : 196 Question Id : 41809919398 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solar beam radiation is measured with the help of :

Options :

Pyrometer

1. ✖

Pyranometer

2. ✖

Pyrheliometer

3. ✔

Anemometer.

4. ✖

Question Number : 197 Question Id : 41809919399 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a wind turbine 10 m long blade, rotating at a speed of 20 r.p.m in 12 kmph wind, the

Tip Speed Ratio (TSR) is:

Options :

1. ✖ Π

2. ✔ 2Π

3. ✖ 3Π

4. ✖ 4Π

Question Number : 198 Question Id : 41809919400 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermo-chemical conversion, in which Bio - mass is heated in the absence of oxygen

is called:

Options :

1. ✔ Pyrolysis

2. ✖ Incineration

3. ✖ Gasification

4. ✖ Densification.

Question Number : 199 Question Id : 41809919401 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In MHD Power generation, the air at the entrance of the Magneto Hydro Dynamic (MHD) duct is seeded with:

Options :

1. ✖ Sodium

2. ✖ Calcium

3. ✖ Venadium

4. ✔ Potassium

Question Number : 200 Question Id : 41809919402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A fuel cell is used to convert chemical energy into _____ energy.

Options :

1. ✖ Mechanical

2. ✖ Solar

3. ✔ Electrical

4. ✖ Thermal.