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 08th May 2024 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 :	210688178
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 : 2106889007 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\begin{vmatrix} 15-x & 11 & 10 \\ 11-3x & 17 & 16 \\ 7-x & 14 & 13 \end{vmatrix}=0$ then the value of x is

Options :

1. ✔ 6

2. ✖ 5

3. ✖ 7

4. ✖ -6

Question Number : 2 Question Id : 2106889008 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The adjoint of $A = \begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{pmatrix}$ is

Options :

1. ✖ $\begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{pmatrix}$

2. ✖ $\begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & -4 \\ 1 & -2 & 1 \end{pmatrix}$

3. ✔ $\begin{pmatrix} 3 & 0 & 6 \\ 6 & 3 & 0 \\ 9 & 6 & 3 \end{pmatrix}$

4. ✖ $\begin{pmatrix} 3 & 2 & 1 \\ 4 & 1 & -1 \\ 0 & 3 & 4 \end{pmatrix}$

Question Number : 3 Question Id : 2106889009 Display Question Number : Yes Is Question

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

If $A = \begin{pmatrix} 3 & 2 & x \\ 4 & 1 & -1 \\ 0 & 3 & 4 \end{pmatrix}$ is a singular matrix then the value of x is

Options :

1. ✔ $11/12$

2. ✖ $-11/12$

3. ✖ $13/12$

4. ✖ $5/4$

Question Number : 4 Question Id : 2106889010 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 following simultaneous linear equations by using Cramer's rule 3x+4y+5z=18; 2x-y+8z=13; 5x-2y+7z=20 is

Options :

1. ✖ -3, -1,1

2. ✔ 3,1,1

3. ✖ 3,0,1

4. ✖ 3,1,-1

Question Number : 5 Question Id : 2106889011 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 $\begin{vmatrix} 441 & 442 & 443 \\ 445 & 446 & 447 \\ 449 & 450 & 451 \end{vmatrix}$ is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 4

4. ✖ 6

Question Number : 6 Question Id : 2106889012 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\frac{3x-1}{(x-1)(x-2)(x-3)} =$$

Options :

1. ✖ $\frac{2}{x-1}+\frac{5}{x-2}-\frac{4}{x-3}$

2. ✖ $\frac{-1}{x-1}+\frac{5}{x-2}-\frac{4}{x-3}$

3. ✖ $\frac{1}{x-1}+\frac{5}{x-2}+\frac{4}{x-3}$

4. ✔ $\frac{1}{x-1}-\frac{5}{x-2}+\frac{4}{x-3}$

Question Number : 7 Question Id : 2106889013 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\frac{5x+1}{(x+2)(x-1)} =$

Options :

1. ✔ $\frac{3}{x+2}+\frac{2}{x-1}$

2. ✖ $\frac{3}{x+2}-\frac{2}{x-1}$

3. ✖ $\frac{-3}{x+2}+\frac{2}{x-1}$

4. ✖ $\frac{3}{x-2}+\frac{2}{x+1}$

Question Number : 8 Question Id : 2106889014 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$cos100^0 cos40^0 + sin100^0 sin40^0 \ =$

Options :

1. ✔ $\frac{1}{2}$

2. ✖ $-\frac{1}{2}$

3. ✖ $\frac{1}{4}$

4. ✖ $\frac{1}{8}$

Question Number : 9 Question Id : 2106889015 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $sin\theta = \frac{3}{5}, \theta$ *is acute,* then $2tan\theta + 3sec\theta + 4sec\theta\ cosec\theta =$

Options :

1. ✖ -1

2. ✔ $\frac{163}{12}$

3. ✖ $\frac{-163}{12}$

4. ✖ $\frac{13}{12}$

Question Number : 10 Question Id : 2106889016 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $tan^{-1}x + tan^{-1}y + tan^{-1}z = \frac{\pi}{2}$ then $xy + yz + zx \ =$

Options :

1. ✖ -1

2. ✖ 3

3. ✖ 5

4. ✔ 1

Question Number : 11 Question Id : 2106889017 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A = \frac{\pi}{6}$ and $B = \frac{\pi}{3}$ then $16\text{Sin}^3A + 8\text{Cos}^3B =$

Options :

1. ✔ 3

2. ✖ 1

3. ✖ -3

4. ✖ 0

Question Number : 12 Question Id : 2106889018 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x + \frac{1}{x} = 2\cos\theta$ then $x^n + \frac{1}{x^n} =$

Options :

1. ✔ $2\cos n\theta$

2. ✖ $-2\cos n\theta$

3. ✖ $3\cos\theta$

4. ✖ $2\sin n\theta$

Question Number : 13 Question Id : 2106889019 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\cos\left[\sin^{-1}\left(\frac{1}{2}\right)+\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right] =$$

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 3

4. ✔ -1

Question Number : 14 Question Id : 2106889020 Display Question Number : Yes Is Question

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

If $sin\alpha = {}^{15}/_{17}\ , cos\beta = {}^{12}/_{13}$ then $sin(\alpha + \beta)\ =$

Options :

1. ✖ ${}^{110}/_{105}$

2. ✖ $-{}^{121}/_{152}$

3. ✔ ${}^{220}/_{221}$

4. ✖ ${}^{5}/_{4}$

Question Number : 15 Question Id : 2106889021 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If x is an acute angle and $sin(x + 10^0) = cos(3x - 68^0)$ then $x\ =$

Options :

1. ✖ 48^0

2. ✔ 37^0

3. ✖ 38^0

4. ✖ 10^0

Question Number : 16 Question Id : 2106889022 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\tan^{-1}(2sin150^0) =$

Options :

1. ✖ π

2. ✖ 3π

3. ✖ $\frac{\pi}{2}$

4. ✔ $\frac{\pi}{4}$

Question Number : 17 Question Id : 2106889023 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 $4cos^2x - 3 = 0$ is

Options :

1. ✔ $2n\pi \pm \frac{\pi}{6}$

2. ✖ $2n\pi \pm \frac{7\pi}{6}$

3. ✖ $3n\pi \pm \frac{5\pi}{6}$

4. ✖ $2n\pi \pm \frac{11\pi}{6}$

Question Number : 18 Question Id : 2106889024 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\left(\frac{\sqrt{3}}{2} + \frac{i}{2}\right)^5 - \left(\frac{\sqrt{3}}{2} - \frac{i}{2}\right)^5 =$

Options :

1. ✔ i

2. ✖ $-i$

3. ✖ $2i$

4. ✖ $-3i$

Question Number : 19 Question Id : 2106889025 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The modulus of the complex number $\left(-1-\sqrt{3}i\right)$ is

Options :

1. ✖ 1

2. ✖ 6

3. ✔ 2

4. ✖ 4

Question Number : 20 Question Id : 2106889026 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the line $2y = 5x + k$ is a tangent to the parabola $y^2 = 6x$ then $k =$

Options :

1. ✖ $\frac{2}{5}$

2. ✖ $\frac{3}{5}$

3. ✔ $\frac{6}{5}$

4. ✖ $\frac{7}{5}$

Question Number : 21 Question Id : 2106889027 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 major axis of the ellipse: $4x^2 + 3y^2 = 48$ is

Options :

1. ✖ 10

2. ✖ 11

3. ✔ 8

4. ✖ 12

Question Number : 22 Question Id : 2106889028 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eccentricity of the hyperbola $36x^2 - 25y^2 = 900$ is

Options :

1. ✔ $\frac{\sqrt{61}}{5}$

2. ✖ $\frac{9}{2}$

3. ✖ $\frac{3}{2}$

4. ✖ $\frac{5}{2}$

Question Number : 23 Question Id : 2106889029 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 tangent from $(1,3)$ to the circle $x^2 + y^2 - 2x + 4y - 11 = 0$ is

Options :

1. ✖ 2

2. ✔ 3

3. ✖ 5

4. ✖ 4

Question Number : 24 Question Id : 2106889030 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the line $2x + \sqrt{6}\,y = 2$ touches the hyperbola $x^2 - 2y^2 = 4$ then the point of contact is

Options :

1. ✖ $(4, \sqrt{6})$

2. ✔ $(4, -\sqrt{6})$

3. ✖ $(-4,6)$

4. ✖ $(5,7)$

Question Number : 25 Question Id : 2106889031 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 parabola with focus at (-3,2) and vertex (-2,2) is

Options :

1. ✖ $x^2 - 4x + 8y + 12 = 0$

2. ✖ $x^2 + 5x - 8y - 11 = 0$

3. ✔ $y^2 + 4x - 4y + 12 = 0$

4. ✖ $x^2 - 4x - 8y - 12 = 0$

Question Number : 26 Question Id : 2106889032 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\lim_{x \to 0} \frac{a^x - b^x}{x} =$

Options :

1. ✖ $\log\left(\frac{b}{a}\right)$

2. ✖ $2\log\left(\frac{b}{a}\right)$

3. ✔ $\log\left(\frac{a}{b}\right)$

4. ✖ $2\log\left(\frac{a}{b}\right)$

Question Number : 27 Question Id : 2106889033 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x = a\left[\cos t + log\left(tan\frac{t}{2}\right)\right]$, $y = a\sin t$ then $\frac{dy}{dx}$ is

Options :

1. ✖ $-\tan t$

2. ✔ $\tan t$

3. ✖ $\tan t + \sin t$

4. ✖ $\sin t$

Question Number : 28 Question Id : 2106889034 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an error of 3% occurs in measuring the side of a cube then the percentage error in its volume is

Options :

1. ✖ 3

2. ✖ 7

3. ✖ 8

4. ✔ 9

Question Number : 29 Question Id : 2106889035 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 curves $y = x^2 + 3x - 7$ and $y^2 = 2x + 5$ at $(2,3)$ is

Options :

1. ✔ $\tan\theta = 2$

2. ✖ $\sec\theta = 2$

3. ✖ $\cos\theta = 1$

4. ✖ $\sin\theta = 3$

Question Number : 30 Question Id : 2106889036 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = \log\left(\frac{x^2+y^2}{x+y}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$

Options :

1. ✖ 2

2. ✖ 4

3. ✖ 5

4. ✔ 1

Question Number : 31 Question Id : 2106889037 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The interval in which the function $f(x) = x^2 logx$ is a decreasing function is

Options :

1. ✖ $(1\ ,\ e^{-1/2}\ )$

2. ✖ $(2\ ,\ e^{-1/2}\ )$

3. ✖ $(-\infty, 0)$

4. ✔ $(0\ ,\quad e^{-1/2})$

Question Number : 32 Question Id : 2106889038 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $z = e^{(ax+by)} f(ax - by)$ then $b\frac{\partial z}{\partial x} + a\frac{\partial z}{\partial y} =$

Options :

1. ✖ $-2abz$

2. ✖ $3abz$

3. ✔ 2abz

4. ✖ 5abz

Question Number : 33 Question Id : 2106889039 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The volume of a spherical ball is increasing at the rate of 4π cc/s, then the rate of increase of the radius, when the volume is $288\pi\ cc$ is

Options :

1. ✖ 2 cm/sec

2. ✔ 1/36 cm/sec

3. ✖ 1/ 4 cm/sec

4. ✖ 6 cm/sec

Question Number : 34 Question Id : 2106889040 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The slope of the tangent to the curve $y = 5x^2$ at the point $x = -1$ is

Options :

1. ✖ 10

2. ✖ 7

3. ✔ -10

4. ✖

-9

Question Number : 35 Question Id : 2106889041 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The extreme values of the function $f(x) = x^3 - 9x^2 + 15x - 1$ are

Options :

1. ✔ 6,-26

2. ✖ 3,-26

3. ✖ 6,26

4. ✖ -6,-26

Question Number : 36 Question Id : 2106889042 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\int_0^2 \sqrt{4 - x^2}\, dx =$

Options :

1. ✖ $\frac{\pi}{2}$

2. ✖ $-\frac{\pi}{2}$

3. ✔ π

4. ✖ $-\pi$

Question Number : 37 Question Id : 2106889043 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 $\int x\sqrt{x}\,dx$ on $[0, \infty)$ is

Options :

1. ✔ $\frac{2}{5}x^{5/2} + c$

2. ✖ $-\frac{2}{5}x^{5/2} + c$

3. ✖ $\frac{2}{5}x^{-5/2} + c$

4. ✖ $\frac{2}{3}x^{3/2} + c$

Question Number : 38 Question Id : 2106889044 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area enclosed between the curve $y^2 = 4x$ and the line $x = 2y$ is

Options :

1. ✖ $\frac{64}{5}$ sq. units

2. ✔ $\frac{64}{3}$ sq. units

3. ✖ $\frac{65}{4}$ sq. units

4. ✖ $\frac{63}{4}$ sq. units

Question Number : 39 Question Id : 2106889045 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int \frac{dx}{\sqrt{4x^2-4x+2}} =$$

Options :

1. ✖ $-\frac{1}{2}\sinh^{-1}(x-1)+c$

2. ✖ $\frac{1}{2}\sinh^{-1}(2x+1)+c$

3. ✔ $\frac{1}{2}\sinh^{-1}(2x-1)+c$

4. ✖ $\frac{1}{2}\sinh^{-1}(3x-1)+c$

Question Number : 40 Question Id : 2106889046 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\int_0^{\pi/2} \frac{sinx}{1+cos^2x}\,dx =$

Options :

1. ✔ $\pi/4$

2. ✖ $-\pi/4$

3. ✖ $\pi/3$

4. ✖ $\pi/2$

Question Number : 41 Question Id : 2106889047 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mean value of $\frac{1}{4+x^2}$ on $[-2,2]$ is

Options :

1. ✖ $\frac{\pi}{12}$

2. ✖ $-\frac{\pi}{2}$

3. ✖ $\frac{\pi}{2}$

4. ✔ $\frac{\pi}{16}$

Question Number : 42 Question Id : 2106889048 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\int_0^{\pi/4} \sqrt{1+sin2x}\, dx =$

Options :

1. ✖ -1

2. ✖ -3

3. ✖ 3

4. ✔ 1

Question Number : 43 Question Id : 2106889049 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area enclosed by the curves $y = 3x$ and $y = 6x - x^2$ is

Options :

1. ✖ $\frac{7}{2}$ square units

2. ✖ $\frac{5}{2}$ square units

3. ✖ $\frac{3}{2}$ square units

4. ✔ $\frac{9}{2}$ square units

Question Number : 44 Question Id : 2106889050 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 $\int \frac{e^x(1+x)}{(2+x)^2}\,dx$ on $I \in R \setminus\{-2\}$ is

Options :

1. ✔ $\frac{e^x}{2+x}+c$

2. ✖ $-\frac{e^x}{2+x}+c$

3. ✖ $\frac{e^x}{2-x}+c$

4. ✖ $\frac{e^{3x}}{2+x}+c$

Question Number : 45 Question Id : 2106889051 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 homogeneous differential equation $xy^2\,dy-(x^3+y^3)\,dx=0$ is

Options :

1. ✖ $y^3=-3x^3\log(xc)$

2. ✖ $y^3=3x^3\log(x/c)$

3. ✖

$y^3 = 3x^3\log(x^2c)$

4. $y^3 = 3x^3\log(xc)$ ✔

Question Number : 46 Question Id : 2106889052 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order and degree of the differential equation $\left(\frac{dy}{dx}\right)^2 + 3\left(\frac{dy}{dx}\right) + 2 = 0$ is

Options :

1. Order=2, degree=2 ✖

2. Order=2, degree=1 ✖

3. order = 1, degree = 2 ✔

4. Order=3, degree=1 ✖

Question Number : 47 Question Id : 2106889053 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The necessary and the sufficient condition for the differential equation $M(x,y)dx + N(x,y)dy = 0$ to be an exact equation is

Options :

1. ✖ $\frac{\partial M}{\partial x}=\frac{\partial N}{\partial y}$

2. ✔ $\frac{\partial M}{\partial y}=\frac{\partial N}{\partial x}$

3. ✖ $\frac{\partial M}{\partial y}=-\frac{\partial N}{\partial x}$

4. ✖ $\frac{\partial M}{\partial x}=-\frac{\partial N}{\partial y}$

Question Number : 48 Question Id : 2106889054 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 $\frac{dy}{dx}+\frac{y}{x}=y^2x$ is

Options :

1. ✔ $\frac{1}{xy}=-x+c$

2. ✖ $\frac{-1}{xy}=-x+c$

3. ✖ $\frac{2}{xy}=x+c$

4. ✖ $\frac{1}{y} = -x + c$

Question Number : 49 Question Id : 2106889055 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 $(D^2 + 10D + 25)y = 0$ is

Options :

1. ✔ $y = e^{-5x}\ (c_1 x + c_2)$

2. ✖ $y = e^{3x}(c_1 \cos 2x + c_2 \sin 2x)$

3. ✖ $y = e^{3x}(c_1 \cos 2x - c_2 \sin 2x)$

4. ✖ $y = e^{3x}(c_1 \cos 3x + c_2 \sin 3x)$

Question Number : 50 Question Id : 2106889056 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The complementary function of $(D^2 + 3D + 2)y = 8sin5x$ is

Options :

1. ✔ $c_1 e^{-x} + c_2 e^{-2x}$

2. $c_1e^x + c_2e^{2x}$ ✖

3. $c_1e^{-x} + c_2e^{2x}$ ✖

4. $c_1e^{2x} + c_2e^{3x}$ ✖

Physics

Section Id :	210688179
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 : 2106889057 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If we choose velocity **V**, acceleration **A** and force **F** as fundamental physical quantities then how would you express angular momentum in terms of **V**, **A** and **F**.

Options :

1.

✖ $F^1 A^{-1} V^1$

2. ✖ $F^1 A^0 V^1$

3. ✖ $F^1 A^{-1} V^2$

4. ✔ $F^1 A^{-2} V^3$

Question Number : 52 Question Id : 2106889058 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the velocity of a body at any time 't' is given by the equation $v = A t^2 + B t + C$, then the unit of A is

Options :

1. ✖ metre/sec

2. ✖ metre/sec^2

3. ✔ metre/sec^3

4. ✖ metre

Question Number : 53 Question Id : 2106889059 Display Question Number : Yes Is Question

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

If $|\mathbf{A}| + |\mathbf{B}| = |\mathbf{C}|$ and $\mathbf{A} + \mathbf{B} = \mathbf{C}$, then the angle between vectors $\mathbf{A}$ and $\mathbf{B}$ is

Options :

1. ✖ $90°$

2. ✖ $60°$

3. ✔ $0°$

4. ✖ $120°$

Question Number : 54 Question Id : 2106889060 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area of triangle with sides as $\mathbf{A} = 2\mathbf{i} + 3\mathbf{j}$ and $\mathbf{B} = \mathbf{i} + 4\mathbf{j}$ is

Options :

1. ✖ 5 units

2. ✖ 10 units

3. ✔ 2.5 units

4. ✖ 20 units

Question Number : 55 Question Id : 2106889061 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the velocity of a body moving with uniform acceleration is doubled in t_1 sec and tripled in t_2 sec then

Options :

1. ✔ $t_2 = 2\ t_1$

2. ✖ $t_1 = 2\ t_2$

3. ✖ $t_1 t_2 = 2$

4. ✖ $t_2 = 3\ t_1$

Question Number : 56 Question Id : 2106889062 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a body travels half of its total path in the last second of its fall from rest then the height of its fall is (take $g = 10\ ms^{-2}$)

Options :

1. ✔ 57.1m

2. ✖ 28.26m

3. ✖ 64m

4. ✖ 45m

Question Number : 57 Question Id : 2106889063 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Olympics, a javelin thrown at an angle 45° attains a maximum height of 30m, then the horizontal distance covered by the javelin is

Options :

1. ✖ 60m

2. ✔ 120m

3. ✖ 100m

4. ✖ 90m

Question Number : 58 Question Id : 2106889064 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coefficient of friction between the floor and the wooden cube of side length 0.5m is 0.2. The coefficient of friction for a wooden cube of side length 1m is

Options :

1. ✔ 0.2

2. ✖ 0.5

3. ✖ 0.1

4. ✖ 0.4

Question Number : 59 Question Id : 2106889065 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The force required just to move a body up an inclined plane is double the force required just to prevent the body sliding down it. If The coefficient of friction is $1/\sqrt{3}$, then the angle of the plane is

Options :

1. ✖ 45°

2. ✖ 30°

3. ✖ 53°

4. ✔ 60°

Question Number : 60 Question Id : 2106889066 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an ice block of mass 42Kg moves with initial velocity 4m/s on a rough surface of coefficient of friction 0.1. then the amount of ice melted as a result of friction before the block comes to rest is

Options :

1. ✖ 0.5 gm.

2. ✔ 1 gm.

3. ✖ 8 gm.

4. ✖ 16 gm.

Question Number : 61 Question Id : 2106889067 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ship of mass 3×10^7 Kg initially at rest is pulled by a force of 5×10^4 N through a distance of 3m. Assuming that the resistance due to water is negligible, the speed of the ship is

Options :

1. ✖ 2 m/s

2. ✔ 0.1 m/s

3. ✖ 0.2 m/s

4. ✖ 10 m/s

Question Number : 62 Question Id : 2106889068 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a force $\mathbf{F} = 2\,\mathbf{i} + 4\,\mathbf{j} + 5\,\mathbf{k}$ newton acts on a body and produces a displacement of $\mathbf{S} = 3\,\mathbf{i} + 2\,\mathbf{j} + \mathbf{k}$ metre., then the work done by this force is

Options :

1. ✖ 13 J

2. ✖ 15 J

3. ✖ 17 J

4. ✔ 19 J

Question Number : 63 Question Id : 2106889069 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An engine expends 45 HP in propelling a car along a level track at 15m/s. The total retarding force acting on the car is

Options :

1. ✔ 2238 N

2. ✖ 3900 N

3. ✖ 3228 N

4. ✖ 4280 N

Question Number : 64 Question Id : 2106889070 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two bodies A and B of equal masses are suspended from two separate massless springs of spring constants K_1 and K_2 respectively. If the two bodies oscillate such that their maximum velocities are equal, the ratio of amplitude of A to that of B is

Options :

1. ✖ $\frac{K_1}{K_2}$

2. ✖ $\frac{K_2}{K_1}$

3. ✔ $\sqrt{\frac{K_2}{K_1}}$

4. ✖

$\sqrt{\frac{K_1}{K_2}}$

Question Number : 65 Question Id : 2106889071 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A block is on a piston which is moving vertically with a SHM of period 1sec. The amplitude of the motion at which block and the piston will separate is (take $g = 10\,ms^{-2}$)

Options :

1. ✔ 0.25m

2. ✖ 0.5m

3. ✖ 0.75m

4. ✖ 1m

Question Number : 66 Question Id : 2106889072 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A seconds pendulum is working in a lift. If the lift begins to fall freely, then what will be the time period of the pendulum in this case

Options :

1. ✖ 2 sec

2. ✖ 1 sec

3. ✖ 0

4. ✔ infinity

Question Number : 67 Question Id : 2106889073 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A tuning fork of frequency 90 hertz is sounded and moving towards an observer with a velocity equal to one-tenth the velocity of sound; the frequency of the note heard by the observer is

Options :

1. ✔ 100 Hz

2. ✖ 90 Hz

3. ✖ 80 Hz

4. ✖ 110 Hz

Question Number : 68 Question Id : 2106889074 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the reverberation time of a class room of dimensions 100 x 30 x 10 m^3 is 1.5 sec. then the total absorption of the class room is

Options :

1. ✖ 2300 metric Sabine

2. ✔ 3400 metric Sabine

3. ✖ 1700 metric Sabine

4. ✖ 850 metric Sabine

Question Number : 69 Question Id : 2106889075 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The standard constant volume gas thermometer cannot use any vapour as working substance because

Options :

1. ✖ Vapours are likely to catch fire

2. ✔ Vapours are not perfect gases

3. ✖ It is difficult to obtain pure vapours

4. ✖ The properties are not constant over a long range of temperature

Question Number : 70 Question Id : 2106889076 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 state corresponding to 14g of nitrogen(N_2) at pressure P and temperature T, when occupying a volume V, will be (R is universal gas constant)

Options :

1. ✖ $PV = 7RT$

2. ✔ $PV = \frac{1}{2} RT$

3. ✖ $PV = \frac{1}{4} RT$

4. ✖ $PV = 2\ RT$

Question Number : 71 Question Id : 2106889077 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vessel contains certain quantity of gas at a pressure of 80 cm of Hg. If $2/5^{th}$ of the mass of gas leaks out at the same temperature, then the pressure of remaining gas is

Options :

1. ✖ 40 cm of Hg

2.

✖ 32 cm of Hg

3. ✔ 48 cm of Hg

4. ✖ 20 cm of Hg

Question Number : 72 Question Id : 2106889078 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An ideal diatomic gas is heated at constant pressure. The fraction of the heat energy supplied to increase the internal energy of the gas is

Options :

1. ✖ $\frac{2}{5}$

2. ✖ $\frac{3}{5}$

3. ✖ $\frac{3}{7}$

4. ✔ $\frac{5}{7}$

Question Number : 73 Question Id : 2106889079 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The distance between the atoms of a diatomic gas remains constant. Then its molar specific heat at constant volume is

Options :

1. ✔ $\frac{5}{2}R$

2. ✖ $\frac{3}{2}R$

3. ✖ R

4. ✖ $\frac{1}{2}R$

Question Number : 74 Question Id : 2106889080 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In photo electric effect the energy of the emitted electrons is

Options :

1. ✖ Larger than that of incident photon

2. ✔ Smaller than that of incident photon

3. ✖ Same as that of incident photon

4. ✖ Proportional to the intensity of incident light

Question Number : 75 Question Id : 2106889081 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In water-air system for which colour the critical angle is maximum?

Options :

1. ✔ Red

2. ✖ Violet

3. ✖ Yellow

4. ✖ Same for all colours

Chemistry

Section Id :	210688180
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 : 2106889082 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total number of 'm' values possible for a sublevel with l=3 is

Options :

1. ✖ 3

2. ✖ 5

3. ✔ 7

4. ✖ 9

Question Number : 77 Question Id : 2106889083 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 Rydberg constant for hydrogen atom (R_H) (in m^{-1}) is

Options :

1. ✖ 1.09×10^{-5}

2. ✖ 1.09×10^{-7}

3. ✖ 1.09×10^{5}

4. ✔ 1.09×10^{7}

Question Number : 78 Question Id : 2106889084 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, the orbitals are correctly arranged in the order of increasing energy?

Options :

1. ✖ $3d < 4s < 4d < 5p$

2. ✔ $4s < 3d < 5p < 4d$

3. ✖ $4s < 5p < 3d < 4d$

4. ✖ $3d < 4d < 4s < 5p$

Question Number : 79 Question Id : 2106889085 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Identify the molecule in which central atom has octet of electrons.

Options :

1. ✔ H_2O

2. ✖ $BeCl_2$

3. ✖ BCl_3

4. ✖ PCl_5

Question Number : 80 Question Id : 2106889086 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The incorrect statement about an ionic compound is

Options :

1. ✖ It is readily soluble in water

2. ✔ It is a conductor in solid state

3. ✖ It has non directional ionic bond

4. ✖ It has high melting point

Question Number : 81 Question Id : 2106889087 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The weight of 0.01 moles of $KClO_3$ (in g) is (K = 39u, Cl = 35.5 u, O = 16u)

Options :

1. ✔ 1.225

2. ✖ 2.45

3. ✖ 3.225

4. ✖ 1.205

Question Number : 82 Question Id : 2106889088 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

100 ml of 0.1M HCl is mixed with 100 ml of 0.1M H_2SO_4 and the solution is diluted to 1.0 L. the Molarity of the final solution is

Options :

1. ✖ 0.01 M

2. ✖ 0.02 M

3. ✔ 0.03 M

4. ✖ 0.04 M

Question Number : 83 Question Id : 2106889089 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The normality of 5.3% (w/v) solution of Na_2CO_3 is (Na = 23u, C = 12u, O = 16u)

Options :

1. ✖ 0.5 N

2. ✖ 3 N

3. ✖ 2 N

4. ✔ 1 N

Question Number : 84 Question Id : 2106889090 Display Question Number : Yes Is Question

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

Identify the substance which can act only as Lewis acid

Options :

1. ✖ HCl

2. ✔ $AlCl_3$

3. ✖ NH_3

4. ✖ H_2O

Question Number : 85 Question Id : 2106889091 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At 25^0C, 4.0 g of NaOH is Present in 2.0 L solution. The ionic product of water (in mol^2/L^2) at that temperature is

Options :

1. ✔ 1×10^{-14}

2. ✖ 1×10^{-13}

3. ✖ 1×10^{-12}

4. ✖ 5×10^{-14}

Question Number : 86 Question Id : 2106889092 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 strong electrolyte?

Options :

1. ✖ HCl (aq)

2. ✖ $H_2SO_4(aq)$

3. ✖ $CH_3COONa(aq)$

4. ✔ $NH_4OH(aq)$

Question Number : 87 Question Id : 2106889093 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many grams of copper is deposited on cathode, when 0.5F current is passed through 100 ml of 0.1 M $CuSO_4$ solution? (Molecular Weight of $CuSO_4$ = 63.5u)

Options :

1. ✖ 63.5

2. ✖ 16.35

3. ✔ 15.875

4. ✖ 31.75

Question Number : 88 Question Id : 2106889094 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The electrolyte commonly used in salt bridge is

Options :

1. ✖ $ZnCl_2$

2. ✔ KCl

3. ✖ $MgCl_2$

4. ✖ $CaSO_4$

Question Number : 89 Question Id : 2106889095 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At 25^0C, the emf of the cell $Zn|Zn^{2+}(1M)||Cu^{2+}(1M)|Cu$ is __

(Given: $E^0_{Zn^{2+}}|Zn = -0.76$ V & $E^0_{Cu^{2+}}|Cu = +0.34$ V)

Options :

1. ✔ 1.1 V

2. ✖ -0.46 V

3. ✖ -1.1 V

4. ✖ 1.5 V

Question Number : 90 Question Id : 2106889096 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water gets permanent hardness due to

Options :

1. ✖ NaCl

2. ✖ KCl

3. ✔ $MgCl_2$

4. ✖ $AlCl_3$

Question Number : 91 Question Id : 2106889097 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

2.43 g of $Ca(HCO_3)_2$ (molecular weight is 162u) is present in 20L water sample.

The degree of hardness of water (in mg/l) is__

Options :

1. ✖ 150

2. ✔ 75

3. ✖ 200

4. ✖ 125

Question Number : 92 Question Id : 2106889098 Display Question Number : Yes Is Question

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

In softening of hardwater by ion exchange resin method, the cation exchange resin contains

Options :

1. ✔ -COOH group

2. ✖ -OH group

3. ✖ $-NH_3OH$ group

4. ✖ $-Al_2Si_2O_8$ group

Question Number : 93 Question Id : 2106889099 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Corrosion is

Options :

1. ✖ A chemical process

2. ✖ An electrical process

3. ✔

An electrochemical process

4. ✖ A physical process

Question Number : 94 Question Id : 2106889100 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Galvanization is applying a coating of

Options :

1. ✔ Zn

2. ✖ Pb

3. ✖ Cr

4. ✖ Cu

Question Number : 95 Question Id : 2106889101 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hetero atom present in neoprene is

Options :

1. ✖ S

2. ✖ O

3. ✔ Cl

4. ✖ F

Question Number : 96 Question Id : 2106889102 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The monomer of Teflon is

Options :

1. ✖ C_2Cl_4

2. ✖ C_2Br_2

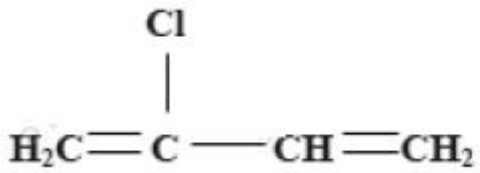
3. ✔ C_2F_4

4. ✖ C_2F_6

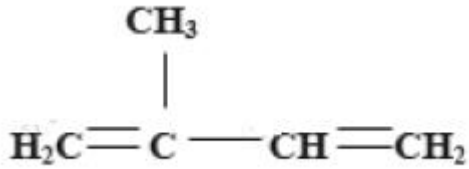
Question Number : 97 Question Id : 2106889103 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The structure of the monomer of natural rubber is

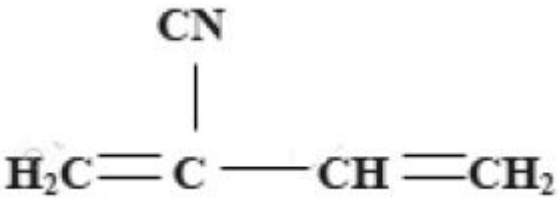
Options :

1. 

✖

2. 

✔

3. 

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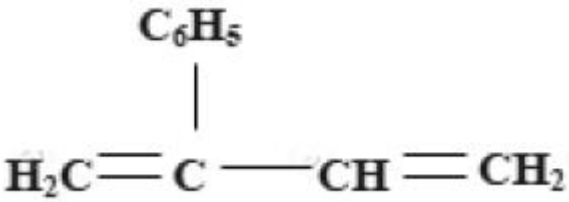
4. 

✖

Question Number : 98 Question Id : 2106889104 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The major components of producer gas are

Options :

1. ✖ CO, H_2

2. ✔ CO, N_2

3. ✖ CH_4, CO

4. ✖ CH_4, N_2

Question Number : 99 Question Id : 2106889105 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Depletion of ozone layer causes

Options :

1. ✖ Forest fires

2. ✖ Eutrophication

3. ✖ Bio-Magnification

4. ✔ Skin Cancer

Question Number : 100 Question Id : 2106889106 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 secondary pollutant?

Options :

1. ✖ CO_2

2. ✖ SO_2

3. ✔ Peroxyacetyl nitrate

4. ✖ NO_2

Mechanical Engineering

Section Id :	210688181
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 : 2106889107 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 hand saw used in carpentry, is suitable for curve cutting ?

Options :

1. ✖ Rip saw

2. ✖ Cross-cut saw

3. ✖ Backsaw

4. ✔ Coping saw.

Question Number : 102 Question Id : 2106889108 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of chisel is used in cutting keyways in wheels and shafts?

Options :

1. ✖ Flat chisel

2. ✔

Cross-cut chisel

3. ✖ Side chisel

4. ✖ Diamond-point chisel

Question Number : 103 Question Id : 2106889109 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The tool, which is used in sheet metal work, like a pair of scissors to cut thin soft sheet metal, is called:

Options :

1. ✖ Divider

2. ✔ Snip

3. ✖ Stakes

4. ✖ Scriber

Question Number : 104 Question Id : 2106889110 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The forging tool used to enlarge and shape a hole to a specific dimension or shape is called:

Options :

1. ✖ Fullers

2. ✖ Swages

3. ✖ Flatters

4. ✔ Drift

Question Number : 105 Question Id : 2106889111 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hot working of metals is carried out:

Options :

1. ✖ Below the recrystallisation temperature

2. ✖ Below the recrystallisation temperature and above the melting temperature.

3. ✔ Above the recrystallisation temperature and below the melting temperature.

4. ✖ At melting or burning temperature.

Question Number : 106 Question Id : 2106889112 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Metal patterns are used for:

Options :

1. ✖ Small castings

2. ✖ Large castings

3. ✖ Precise and intricate castings

4. ✔ Large scale production of castings.

Question Number : 107 Question Id : 2106889113 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most preferred process for casting gas turbine blades is:

Options :

1. ✖ Die moulding

2. ✖ Shell moulding

3. ✔ Investment moulding

4. ✖ Sand casting.

Question Number : 108 Question Id : 2106889114 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main constituent of moulding sand is:

Options :

1. ✖ Clay

2. ✔ Silica

3. ✖ Alumina

4. ✖ Iron oxide.

Question Number : 109 Question Id : 2106889115 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The cavities formed on the mould and core surfaces (due to erosion) are filled by the molten metal and the same appear on the casting surface as an excess material in the form of ragged spots. These spots are called:

Options :

1. ✖ Hot tears

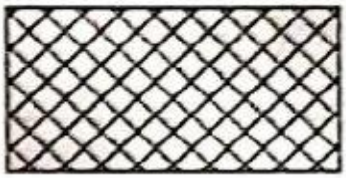
2. ✖ Cold shut

3. ✔ Scabs

4. ✖ Shifts.

Question Number : 110 Question Id : 2106889116 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In machine drawing, the following convention represents which material:



Options :

1. ✖ Steel

2. ✖ Brass

3. ✔ Lead

4. ✖ Cast Iron

Question Number : 111 Question Id : 2106889117 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The positive difference between the maximum size of the hole and the minimum size of the shaft is known as:

Options :

1. ✖ Minimum interference

2. ✖ Maximum interference

3. ✔ Maximum clearance

4. ✖ Minimum clearance

Question Number : 112 Question Id : 2106889118 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 roughness grade number corresponding to the Roughness symbol ' ▽▽ '.

Options :

1. ✖ N2

2. ✖ N5

3. ✔ N8

4. ✖ N11

Question Number : 113 Question Id : 2106889119 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In oxy-acetylene gas welding, for complete combustion, the volume of oxygen required per unit of acetylene is:

Options :

1. ✔ 2.5

2. ✖ 2.0

3. ✖ 1.5

4. ✖ 1.0

Question Number : 114 Question Id : 2106889120 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In arc welding the temperature of heat produced by an electric arc is in the order of:

Options :

1. ✖ 3000 ^{0}C to 4000 ^{0}C

2. ✖ 4000 ^{0}C to 5000 ^{0}C

3. ✖ 5000 ^{0}C to 6000 ^{0}C

4. ✔ 6000 ^{0}C to 7000 ^{0}C

Question Number : 115 Question Id : 2106889121 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Submerged arc welding is a process:

Options :

1. ✖ Which uses a mixture of iron oxide and granular aluminum

2. ✖ Accomplished by maintaining a hot molten metal pool between plates

3. ✔ In which arc is maintained under a blanket of flux

4. ✖ In which no flux or filler metals are used

Question Number : 116 Question Id : 2106889122 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 range of vibratory energy frequency used in ultrasonic welding ?

Options :

1. ✖ 20 MHz to 40 MHz

2. ✔ 20 kHz to 60 kHz

3. ✖ 10 kHz to 15 kHz

4. ✖

1 kHz to 5 kHz

Question Number : 117 Question Id : 2106889123 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 common welding defect ?

Options :

1. ✖ Porosity

2. ✖ Spatter

3. ✔ Over-cut

4. ✖ Distortion.

Question Number : 118 Question Id : 2106889124 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The time taken to face a work-piece of 80 mm diameter if the spindle speed is 80 rpm and cross feed is 0.25 mm/revolution is

Options :

1. ✔ 2 min

2. ✖ 2.5 min

3. ✖ 4 min

4. ✖ 5 min

Question Number : 119 Question Id : 2106889125 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many cutting edges are there in drill bit, used in drilling operation?

Options :

1. ✖ One

2. ✔ Two

3. ✖ Three

4. ✖ Four

Question Number : 120 Question Id : 2106889126 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In down milling operation, thickness of the chip is:

Options :

1. ✖ Minimum at the beginning of the cut and maximum at the end of the cut.

2. ✔ Maximum at the beginning of the cut and minimum at the end of the cut.

3. ✖ Minimum at the beginning and end of the cut and maximum at the middle of the cut

4. ✖ Uniform through out the cut.

Question Number : 121 Question Id : 2106889127 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The unconventional machining process in which abrasive slurry is used between tool and work-piece to remove the material is:

Options :

1. ✔ Ultrasonic machining

2. ✖ Electro chemical machining

3. ✖ Electric discharge machining

4. ✖ Laser beam machining.

Question Number : 122 Question Id : 2106889128 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which surface finishing operation uses bonded abrasive sticks to remove the material from the work-piece?

Options :

1. ✔ Honing

2. ✖ Lapping

3. ✖ Buffing

4. ✖ Burnishing.

Question Number : 123 Question Id : 2106889129 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When holes are required to be machined in several faces in work-piece, the jig used is:

Options :

1. ✖ Pot Jig

2. ✖ Latch jig

3. ✖ Post jig

4. ✔ Box jig.

Question Number : 124 Question Id : 2106889130 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 CNC Lathe part-programme; code for the 'Spindle start reverse CCW' is:

Options :

1. ✖ M03

2. ✔ M04

3. ✖ M05

4. ✖ M08

Question Number : 125 Question Id : 2106889131 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of basic configuration of robot provides one linear and two rotary motions (to the manipulator):

Options :

1. ✖ Cartesian

2. ✔ Polar

3. ✖ Cylindrical

4.

✖ Revolute

Question Number : 126 Question Id : 2106889132 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 full form of AS / RS in Flexible Manufacturing System?

Options :

1. ✖ Automated Storage and Recovery System

2. ✔ Automated Storage and Retrieval System

3. ✖ Automatic Storage and Regenerative System

4. ✖ Applied Storage and Regenerative System

Question Number : 127 Question Id : 2106889133 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 powder based Rapid Prototyping process?

Options :

1. ✖ Sterolithography (SLA)

2. ✖ Fused Deposition Method (FDM)

3. ✔ Selective Laser Sintering (SLS)

4. ✖ Laminated Object Manufacturing (LOM)

Question Number : 128 Question Id : 2106889134 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 material due to which they can be drawn in to wires, is known as:

Options :

1. ✖ Elasticity

2. ✖ Plasticity

3. ✖ stiffness

4. ✔ Ductility

Question Number : 129 Question Id : 2106889135 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 destructive testing method?

Options :

1.

✖ Eddy current test

2. ✖ Ultrasonic test

3. ✔ Creep test

4. ✖ Radio-graphic test

Question Number : 130 Question Id : 2106889136 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 purest form of iron:

Options :

1. ✖ Cast iron

2. ✔ Wrought iron

3. ✖ Grey cast iron

4. ✖ Mild steel

Question Number : 131 Question Id : 2106889137 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process in which the steel is heated at a temperature slightly below the eutectoid temperature and then followed by a slow cooling is known as;

Options :

1. ✖ Normalising

2. ✖ Annealing

3. ✖ Tempering

4. ✔ Spheroidising

Question Number : 132 Question Id : 2106889138 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pearlite phase in an iron-carbon phase diagram is _____

Options :

1. ✖ Eutectic phase

2. ✖ Hypo-eutectic mixture

3. ✔ Eutectoidal mixture

4. ✖ Hyper-eutectic phase

Question Number : 133 Question Id : 2106889139 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bell metal which is used for making bell, is an alloy of Copper and _____.

Options :

1. ✖ Zinc

2. ✔ Tin

3. ✖ Lead

4. ✖ Bismuth.

Question Number : 134 Question Id : 2106889140 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

"The moment of a force about any point is equal to the algebraic sum of the moments of the component forces about the same point". This principle is known as:

Options :

1. ✖ Lame's theorm

2. ✔ Verignon's principle

3. ✖ D'Alembert's principle

4. ✖ Principle of transmissibility of forces.

Question Number : 135 Question Id : 2106889141 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum efficiency of a screw jack (lifting machine) is:

(where ϕ = friction angle)

Options :

1. ✔ $\frac{(1-\sin\phi)}{(1+\sin\phi)}$

2. ✖ $\frac{(1+\sin\phi)}{(1-\sin\phi)}$

3. ✖ $\frac{(1-\cos\phi)}{(1+\cos\phi)}$

4. ✖ $\frac{(1+\cos\phi)}{(1-\cos\phi)}$

Question Number : 136 Question Id : 2106889142 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The relationship between modulus of elasticity (E) , modulus of rigidity (G) and bulk modulus (K) is:

Options :

1. ✔ $G = \frac{3KE}{(9K-E)}$

2. ✖ $G = \frac{3KE}{(9K+E)}$

3. ✖ $G = \frac{9KE}{(3K-E)}$

4. ✖ $G = \frac{9KE}{(3K+E)}$

Question Number : 137 Question Id : 2106889143 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam of length L, cross-sectional area A, carrying a uniformly distributed load w per unit length over the entire span will have maximum bending moment of:

Options :

1. ✖ $\frac{wL^2}{2}$

2. ✖ $\frac{wL^2}{4}$

3. ✔ $\frac{wL^2}{8}$

4. ✖ $\frac{wL^2}{16}$

Question Number : 138 Question Id : 2106889144 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 rectangular cross-section is subjected to a concentrated load W at its free end. If the depth of the beam is doubled and the load is halved, the deflection of the free end as compared to original deflection will be:

Options :

1. ✖ Half

2. ✖ Double

3. ✖ One-eighth

4. ✔ One-sixteenth

Question Number : 139 Question Id : 2106889145 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A circular shaft is subjected to bending moment M and twisting moment T. if the maximum bending stress equals to the maximum shear stress developed, then:

Options :

1. ✔ $M = T / 2$

2. ✖ $M = T$

3. ✖ $M = 2\ T$

4. ✖ $M = 4\ T$

Question Number : 140 Question Id : 2106889146 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Considering the centrifugal tension into account, the power transmitted by the belt drive is maximum at the velocity equal to:

(T = maximum tension in the belt and 'm' = mass of the belt per unit length)

Options :

1. ✖ $\sqrt{\frac{T}{m}}$

2. ✔ $\sqrt{\frac{T}{3\,m}}$

3. ✖ $\sqrt{\frac{2\,T}{m}}$

4. ✖ $\sqrt{\frac{3\,T}{m}}$

Question Number : 141 Question Id : 2106889147 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

In an epicyclic gear train of sun and planetary system, the annular wheel has 80 teeth. If the planet gear has 16 teeth, then the number of teeth on sun gear is:

Options :

1. ✖ 32

2. ✔ 48

3. ✖ 64

4. ✖ 72.

Question Number : 142 Question Id : 2106889148 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

. The condition of 'Isochronism' can be realized in which of the following governor?

Options :

1. ✖ Watt

2. ✖ Porter

3. ✖ Proell

4. ✔ Hartnell

Question Number : 143 Question Id : 2106889149 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 cam-follower motion, the follower has a constant acceleration, when it moves:

Options :

1. ✖ Constant velocity

2. ✖ Simple harmonic motion

3. ✔ Parabolic motion

4. ✖ Cycloidal motion.

Question Number : 144 Question Id : 2106889150 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum efficiency of a self-locking screw is:

Options :

1. ✔ 50 %

2. ✖ 60 %

3. ✖ 70 %

4. ✖ 80 %

Question Number : 145 Question Id : 2106889151 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 rivet head used in boiler plates riveting is:

Options :

1. ✔ Snap head

2. ✖ Pan head

3. ✖ Conical Head

4. ✖ Counter sink head

Question Number : 146 Question Id : 2106889152 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The cross-section of a standard fillet weld is a triangle with base angles:

Options :

1. ✖ 30^o *and* 60^0

2. ✖ 35^o *and* 55^0

3. ✖ 40^o *and* 50^0

4. ✔ 45^o *and* 45^0

Question Number : 147 Question Id : 2106889153 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 is subjected to a bending moment of 4.0 kN-m and a torsional moment of 3.0 kN-m together, then the equivalent bending moment is:

Options :

1. ✔ 5.0 kN-m

2. ✖ 8.0 kN-m

3. ✖ 7.0 kN-m

4. ✖ 9.0 kN-m

Question Number : 148 Question Id : 2106889154 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which case of the following key the induced compressive stresses are twice of shear stresses ?

Options :

1. ✖ Rectangular sunk key

2. ✔ Square sunk key

3. ✖ Kennedy Key

4. ✖ Flat saddle key.

Question Number : 149 Question Id : 2106889155 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A sliding contact bearing, in which there is a thin film of lubricant between the journal and bearing; is known as:

Options :

1. ✖ Zero film lubricated bearing

2. ✔ Boundary lubricated bearing

3. ✖ Hydrostatic lubricated bearing

4. ✖ Hydrodynamic lubricated bearing

Question Number : 150 Question Id : 2106889156 Display Question Number : Yes Is Question

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

If 'C' is the spring index of a close coiled helical compression spring, the 'Wahl factor' is given by:

(where spring index, C = coil diameter / wire diameter of spring)

Options :

1. ✔ $\frac{(4C-1)}{(4C-4)} + \frac{0.615}{C}$

2. ✖ $\frac{(4C-1)}{(4C+4)} + \frac{0.615}{C}$

3. ✖ $\frac{(4C+1)}{(4C-4)} + \frac{0.615}{C}$

4. ✖ $\frac{(4C+1)}{(4C+4)} + \frac{0.615}{C}$

Question Number : 151 Question Id : 2106889157 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 extensive property of a thermodynamic system?

Options :

1. ✔ Volume

2. ✖ Pressure

3. ✖ temperature

4. ✖ Density

Question Number : 152 Question Id : 2106889158 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A closed thermodynamic system is one in which:

Options :

1. ✖ There is no energy and mass transfer across the boundary

2. ✔ There is no mass transfer, but energy transfer exists across the boundary

3. ✖ There is no energy transfer, but mass transfer exists across the boundary

4. ✖ both energy and mass transfer take place across the boundary, but the mass transfer is controlled.

Question Number : 153 Question Id : 2106889159 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Thermodynamic process in which there is no work transfer involved is

Options :

1. ✖ Adiabatic expansion

2. ✖ Isothermal expansion

3. ✖ polytropic expansion

4. ✔ Free expansion

Question Number : 154 Question Id : 2106889160 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 air standard cycles has the highest thermal efficiency for given maximum and minimum cycle temperatures ?

Options :

1. ✖ Brayton

2. ✖ Otto

3. ✖ Diesel

4. ✔ Stirling

Question Number : 155 Question Id : 2106889161 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an Internal Combustion engine, the process of expelling exhaust gasses from the combustion chamber and replacing them with fresh air / fuel-air mixture; is called:

Options :

1. ✔ Scavenging.

2. ✖ Scuffing

3. ✖ Suction

4. ✖ Exhaust

Question Number : 156 Question Id : 2106889162 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main object of Morse test, conducted on I C Engines is to find-out :

Options :

1. ✖ Cooling curves of a multi cylinder petrol engine

2. ✖ Cooling curves of a multi cylinder diesel engine

3. ✔ Frictional power of a multi cylinder petrol engine.

4. ✖ Indicated power of a single cylinder diesel engine.

Question Number : 157 Question Id : 2106889163 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An engine produces 10 kW brake power while working with a brake thermal efficiency of 30 %. If the calorific value of the fuel used is 40,000 kJ/Kg, then what is the fuel consumption?

Options :

1. ✖ 1.5 kg/hour

2. ✔ 3.0 kg/hour

3. ✖ 0.3 kg/hour

4. ✖ 1.0 kg/hour.

Question Number : 158 Question Id : 2106889164 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a two-stage air compressor (reciprocating type): p_1 , p_2 *and* p_3 are intake pressure, intermediate pressure and delivery pressure respectively, then the condition for minimum work done is:

Options :

1. ✖ $p_2 = (p_3 - p_1)$

2. ✖

$$p_2 = \frac{(p_3 + p_1)}{2}$$

3. ✖ $p_2 = p_1 . p_3$

4. ✔ $p_2 = \sqrt{p_1 . p_3}$

Question Number : 159 Question Id : 2106889165 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In centrifugal air compressor, the ratio of Isentropic work to Euler work is called:

Options :

1. ✖ Work coefficient

2. ✖ Velocity coefficient

3. ✔ Pressure coefficient

4. ✖ Flow coefficient.

Question Number : 160 Question Id : 2106889166 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a gas turbine cycle, turbine output is 600 kJ/kg, the compressor work is 400 kJ/kg and the heat supplied is 1000 kJ/kg. The thermal efficiency of the cycle is:

Options :

1. ✖ 80%

2. ✖ 60%

3. ✖ 40%

4. ✔ 20%

Question Number : 161 Question Id : 2106889167 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an open cycle gas turbine plant, regeneration is done to:

Options :

1. ✖ Increase compressor work

2. ✖ Decrease turbine work

3. ✖ Limit the maximum temperature

4. ✔ Improve thermal efficiency.

Question Number : 162 Question Id : 2106889168 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Turbo-Jet Engine, the ratio of thrust power to propulsive power is called:

Options :

1. ✖ Thermal efficiency

2. ✖ Overall Efficiency

3. ✔ Propulsive efficiency

4. ✖ Jet efficiency

Question Number : 163 Question Id : 2106889169 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 Newtonian fluid ?

Options :

1. ✖ Milk

2. ✖ Sewage sludge

3. ✖ Printing ink

4. ✔ Kerosene

Question Number : 164 Question Id : 2106889170 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the capillary rise of water in 2mm diameter glass tube is 15 mm, then the capillary rise in 0.5 mm diameter glass tube will be:

Options :

1. ✖ 15 mm

2. ✖ 30 mm

3. ✖ 45 mm

4. ✔ 60 mm

Question Number : 165 Question Id : 2106889171 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the stream function $\Psi = 2\,x\,y$, then the velocity at a point (1,1) is equal to:

Options :

1. ✖ $4\sqrt{2}$

2. ✖ $3\sqrt{2}$

3.

✔ $2\sqrt{2}$

4. ✖ $\sqrt{2}$

Question Number : 166 Question Id : 2106889172 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The loss of head (or energy) in pipes due to friction is calculated from Darcy – Weisbach formula, $h_f = \frac{4fLV^2}{D\,2g}$. The value of coefficient of friction 'f' for laminar flow is:

Where 'Re' is the Reynolds number.

Options :

1. ✖ $\frac{4}{Re}$

2. ✖ $\frac{8}{Re}$

3. ✔ $\frac{16}{Re}$

4. ✖ $\frac{64}{Re}$

Question Number : 167 Question Id : 2106889173 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 with a velocity 'V' strikes a flat plate (normal to the water jet) moving towards the jet with a velocity 'U', then the work done by the jet of water is:

(If ρ = density of water and A = nozzle cross sectional area)

Options :

1. ✔ $\rho A U (V + U)^2$

2. ✖ $\rho A U (V - U)^2$

3. ✖ $\rho A V (V + U)^2$

4. ✖ $\rho A V (V - U)^2$

Question Number : 168 Question Id : 2106889174 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In order to have maximum power from a Pelton turbine, the bucket speed must be:

Options :

1. ✖ Equal to the water jet speed

2. ✔ Equal to half of the water jet speed

3. ✖ Equal to twice of the water jet speed

4. ✖ Independent of the water jet speed.

Question Number : 169 Question Id : 2106889175 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

'Degree of reaction' in reaction turbine is defined as the ratio of change in _____ to change in _____ per kg of water.

Options :

1. ✔ pressure energy, total energy

2. ✖ kinetic energy, total energy

3. ✖ pressure energy, kinetic energy

4. ✖ kinetic energy, pressure energy.

Question Number : 170 Question Id : 2106889176 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In centrifugal pump, the manometer head is proportional to:

(if N = speed of the pump)

Options :

1. ✖ N

2. ✔ N^2

3. ✖ N^3

4. ✖ $\sqrt{N}$

Question Number : 171 Question Id : 2106889177 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In reciprocating pump, the rate of flow into or from air vessel is given by:

(when A = Area of piston; N = crank speed in r.p.m; r = crank radius, and θ = crank angle with stroke line)

Options :

1. ✔ $\frac{A\,2\,N\,r\,(\pi\,\sin\theta\,-1)}{60}$

2. ✖ $\frac{A\,2\,N\,r\,(0.75\,\pi\,\sin\theta\,-1)}{60}$

3. ✖ $\frac{A\,2\,N\,r\,(0.5\,\pi\,\sin\theta\,-1)}{60}$

4. ✖ $\frac{A\,2\,N\,r\,(0.25\,\pi\,\sin\theta\,-1)}{60}$

Question Number : 172 Question Id : 2106889178 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In enthalpy-entropy (Mollier) chart, for steam, in superheated region, the constant pressure lines are:

Options :

1. ✖ Horizontal

2. ✖ Vertical

3. ✖ Inclined

4. ✔ Curved.

Question Number : 173 Question Id : 2106889179 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dryness fraction of steam can NOT be determined by which of the following method ?

Options :

1. ✖ Bucket calorimeter

2. ✖ Throttling calorimeter

3. ✖ Separating and throttling calorimeter

4. ✔ Junker's calorimeter

Question Number : 174 Question Id : 2106889180 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If one kg of water is heated from temperature T_1 to T_2 at constant pressure, and C_{pw} = Specific heat of water at constant pressure, then the change in entropy is given by:

Options :

1. ✔ $C_{pw}\ log_e \frac{T2}{T1}$

2. ✖ $C_{pw}\ log_e \frac{T1}{T2}$

3. ✖ $C_{pw}\ log_e \frac{(T1-T2)}{T2}$

4. ✖ $C_{pw}\ log_e \frac{(T2-T1)}{T2}$

Question Number : 175 Question Id : 2106889181 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 high pressure and high temperature, water tube, forced circulation boiler ?

Options :

1. ✖ Stirling

2. ✔ Lamont

3. ✖ Cornish

4. ✖ Bobcock and Wilcox

Question Number : 176 Question Id : 2106889182 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A device used in the steam boilers to discharge a portion of water containing mud, scale of sediments which are accumulated at the bottom of the boiler, is known as:

Options :

1. ✔ Blow off cock

2. ✖ Feed check valve

3. ✖ Fusible plug

4. ✖ Safety valve

Question Number : 177 Question Id : 2106889183 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 steam boiler accessory ?

Options :

1. ✖ Feed pump

2. ✔ Feed check valve

3. ✖ Economizer

4. ✖ Air preheater

Question Number : 178 Question Id : 2106889184 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a saturated steam, the discharge through the steam nozzle, will be maximum when the critical pressure ratio is:

Options :

1. ✖ 0.50

2. ✖ 0.54

3. ✔ 0.58

4. ✖ 0.60

Question Number : 179 Question Id : 2106889185 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum blade efficiency for a single stage impulse turbine, (having equal entrance and exit angles in moving blade and no fluid friction) and α = nozzle angle, is:

Options :

1. ✖ $0.5 \cos \alpha$

2. ✖ $\cos \alpha$

3. ✖ $0.5\ cos^2 \alpha$

4. ✔ $cos^2 \alpha$

Question Number : 180 Question Id : 2106889186 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 compounding method of steam turbine ?

Options :

1. ✖ Velocity compounding

2. ✖ Pressure compounding

3. ✔ Volume compounding

4. ✖ Pressure- velocity compounding.

Question Number : 181 Question Id : 2106889187 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Steam condenser efficiency is defined as:

Options :

1. ✖ $\frac{Saturation\ temparature\ of\ steam\ at\ constant\ pressute}{Rise\ in\ cooling\ water\ temperature}$

2. ✖ $\frac{Temparature\ rise\ in\ cooling\ water}{Saturation\ temperature\ corresponding\ to\ condenser\ pressure}$

3. ✔ $\frac{Rise\ in\ cooling\ water\ temperature}{\{(Temparature\ corresponding\ to\ vaccum\ in\ the\ condenser)-(Inlet\ temparature\ of\ cooling\ water)\}}$

4. ✖ $\frac{Inlet\ temparature\ of\ \ cooling\ water}{Temparature\ rise\ in\ cooling\ water}$

Question Number : 182 Question Id : 2106889188 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 refrigerant used in vapour compression refrigeration system ?

Options :

1. ✖ R-12

2. ✖ R-22

3. ✖ R-134a

4. ✔ R-321

Question Number : 183 Question Id : 2106889189 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a vapour compression refrigeration cycle, the enthalpy remains constant during:

Options :

1. ✖ Compression

2. ✖ Condensation

3. ✖ Evaporation

4. ✔ Expansion

Question Number : 184 Question Id : 2106889190 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an ideal refrigeration (reversed Carnot) cycle; the condenser and evaporator temperatures are 27 ^{0}C and -13 ^{0}C respectively. The coefficient of performance (COP) of this cycle is:

Options :

1. ✖

2.5

2. ✖ 4.5

3. ✔ 5.0

4. ✖ 6.0

Question Number : 185 Question Id : 2106889191 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 component of vapour absorption refrigeration system ?

Options :

1. ✔ Compressor

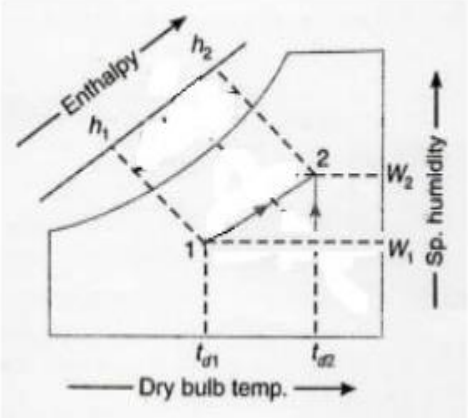
2. ✖ Generator

3. ✖ Absorber

4. ✖ Evaporator

Question Number : 186 Question Id : 2106889192 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the figure below showing some psychrometric process, the curve 1-2 represents:



Options :

1. ✖ Cooling and Humidification

2. ✖ Cooling and Dehumidification

3. ✖ Heating and Dehumidification

4. ✔ Heating and Humidification.

Question Number : 187 Question Id : 2106889193 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, the symbol used for an activity "A person is doing some productive work" is:

Options :

1. ✖ Triangle

2. ✔ Circle

3. ✖ Square

4. ✖ Arrow

Question Number : 188 Question Id : 2106889194 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 control chart used for variable type of data ?

Options :

1. ✔ R – chart

2. ✖ P – chart

3. ✖ C – chart

4. ✖ U – chart

Question Number : 189 Question Id : 2106889195 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of a machine or equipment at the time of their disposal (by selling) is called:

Options :

1. ✖ Book value

2. ✖ Scrap value

3. ✔ Salvage value

4. ✖ Market value

Question Number : 190 Question Id : 2106889196 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the Break Even Analysis chart, if fixed cost decreases then the break-even point will move towards _____ .

Options :

1. ✖ Right side

2. ✔ Left side

3. ✖ Upwards

4. ✖ Downwards

Question Number : 191 Question Id : 2106889197 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A line organization is suitable for which of the following organization ?

Options :

1. ✖ Steel industry

2. ✖ Educational institutions

3. ✔ Oil refinery company

4. ✖ Cool-drink manufacturing company

Question Number : 192 Question Id : 2106889198 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In ABC analysis of inventory control, 'A' stands for:

Options :

1. ✔ Approximately 20 % of the total goods or products with 80 % of revenue generation.

2. ✖ Approximately 30 % of the total goods or products with 15 % of revenue generation.

3. ✖ Approximately 50 % of the total goods or products with 5 % of revenue generation.

4. ✖ Approximately 75 % of the total goods or products with 2 % of revenue generation.

Question Number : 193 Question Id : 2106889199 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of plant lay-out is suitable for 'Cement' manufacturing industry?

Options :

1. ✔ Product lay-out

2. ✖ Process lay-out

3. ✖ Fixed position lay-out

4. ✖ Hybrid or combination Layout.

Question Number : 194 Question Id : 2106889200 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 colour label used on the top of the cylinder for 'Carbon dioxide (CO_2)' filled fire extinguishers ?

Options :

1. ✔ Signal Red label

2. ✖ Black label

3. ✖ Cream label

4. ✖ Blue label

Question Number : 195 Question Id : 2106889201 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 solar constant is _____

Options :

1. ✖ 1144 W/m^2

2. ✖ 1255 W/m^2

3. ✔ 1366 W/m^2

4. ✖ 1477 W/m^2

Question Number : 196 Question Id : 2106889202 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Solar radiation flux density is usually measured using _____

Options :

1. ✔ Pyranometer

2. ✖ Pyrometer

3. ✖ Anemometer

4. ✖ Tachometer

Question Number : 197 Question Id : 2106889203 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rate of change of wind speed with height is called as: _____

Options :

1. ✔ Wind shear

2. ✖ Wind force

3. ✖ wind solidity

4. ✖ Wind rose

Question Number : 198 Question Id : 2106889204 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The air at the entrance of Magneto Hydro Dynamic (MHD) duct can be seeded with potassium up to _____

Options :

1. ✖ 7 %

2. ✖ 5 %

3. ✖ 3 %

4. ✔ 1 %

Question Number : 199 Question Id : 2106889205 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 called 'Biogas' ?

Options :

1. ✖ Biobutanol

2. ✖ Biodiesel

3. ✖ Bioethanol

4. ✔ Biomethane

Question Number : 200 Question Id : 2106889206 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 is used for the construction of control rod in a nuclear reactor?

Options :

1. ✖ Copper

2. ✔ Cadmium

3. ✖ Graphite

4. ✖ Silicon