

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 :	Metallurgical 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 :	210688182
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 : 2106889207 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 : 2106889208 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 : 2106889209 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 : 2106889210 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 : 2106889211 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 : 2106889212 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 : 2106889213 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 : 2106889214 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\cos 100^\circ \cos 40^\circ + \sin 100^\circ \sin 40^\circ =$$

Options :

1. ✔ $\frac{1}{2}$

2. ✖ $-\frac{1}{2}$

3. ✖ $\frac{1}{4}$

4. ✖ $\frac{1}{8}$

Question Number : 9 Question Id : 2106889215 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -1

2. ✔ $\frac{163}{12}$

3. ✖ $\frac{-163}{12}$

4. ✖ $\frac{13}{12}$

Question Number : 10 Question Id : 2106889216 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 : 2106889217 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 $16\sin^3 A + 8\cos^3 B =$

Options :

1. ✓ 3

2. ✗ 1

3. ✗ -3

4. ✗ 0

Question Number : 12 Question Id : 2106889218 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 : 2106889219 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 : 2106889220 Display Question Number : Yes Is Question

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

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

Options :

1. ✖ $\frac{110}{105}$

2. ✖ $-\frac{121}{152}$

3. ✔ $\frac{220}{221}$

4. ✖ $\frac{5}{4}$

Question Number : 15 Question Id : 2106889221 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 $\sin(x + 10^\circ) = \cos(3x - 68^\circ)$ then $x =$

Options :

1. ✖ 48°

2. ✔ 37°

3. ✖ 38^0

4. ✖ 10^0

Question Number : 16 Question Id : 2106889222 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\tan^{-1}(2\sin 150^0) =$$

Options :

1. ✖ π

2. ✖ 3π

3. ✖ $\frac{\pi}{2}$

4. ✔ $\frac{\pi}{4}$

Question Number : 17 Question Id : 2106889223 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 $4\cos^2 x - 3 = 0$ 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 : 2106889224 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 : 2106889225 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 $(-1 - \sqrt{3}i)$ is

Options :

1. ✖ 1

2. ✖ 6

3. ✔ 2

4. ✖ 4

Question Number : 20 Question Id : 2106889226 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 : 2106889227 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 : 2106889228 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 : 2106889229 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 : 2106889230 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 : 2106889231 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 :

$$x^2 - 4x + 8y + 12 = 0$$

1. ✖

$$x^2 + 5x - 8y - 11 = 0$$

2. ✖

$$y^2 + 4x - 4y + 12 = 0$$

3. ✔

$$x^2 - 4x - 8y - 12 = 0$$

4. ✖

Question Number : 26 Question Id : 2106889232 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

$$\log\left(\frac{b}{a}\right)$$

1. ✖

$$2\log\left(\frac{b}{a}\right)$$

2. ✖

3. ✓ $\log\left(\frac{a}{b}\right)$

4. ✗ $2\log\left(\frac{a}{b}\right)$

Question Number : 27 Question Id : 2106889233 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 : 2106889234 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 : 2106889235 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 : 2106889236 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 : 2106889237 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 $f(x) = x^2 \log x$ is a decreasing function is

Options :

1. ✖ $(1, e^{-1/2})$

2. ✖ $(2, e^{-1/2})$

3. ✖ $(-\infty, 0)$

4. ✔ $(0, e^{-1/2})$

Question Number : 32 Question Id : 2106889238 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 : 2106889239 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 288π 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 : 2106889240 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. ✖

Question Number : 35 Question Id : 2106889241 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 : 2106889242 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 : 2106889243 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 : 2106889244 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 : 2106889245 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 : 2106889246 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\pi/4$

2. ✖ $-\pi/4$

3. ✖ $\pi/3$

4. ✖ $\pi/2$

Question Number : 41 Question Id : 2106889247 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 : 2106889248 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int_0^{\pi/4} \sqrt{1 + \sin 2x} \, dx =$$

Options :

1. ✖ -1

2. ✖ -3

3. ✖ 3

4. ✔ 1

Question Number : 43 Question Id : 2106889249 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 : 2106889250 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 $I \in \mathbb{R} \setminus \{-2\}$ 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 : 2106889251 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. ✗

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

4. ✓ $y^3 = 3x^3 \log(xc)$

Question Number : 46 Question Id : 2106889252 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 :

Order=2, degree=2

1. ✗

Order=2, degree=1

2. ✗

order = 1, degree = 2

3. ✓

Order=3, degree=1

4. ✗

Question Number : 47 Question Id : 2106889253 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 : 2106889254 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 : 2106889255 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 : 2106889256 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 $(D^2 + 3D + 2)y = 8\sin 5x$ is

Options :

1. ✔ $c_1 e^{-x} + c_2 e^{-2x}$

$$c_1 e^x + c_2 e^{2x}$$

2. ✖

$$c_1 e^{-x} + c_2 e^{2x}$$

3. ✖

$$c_1 e^{2x} + c_2 e^{3x}$$

4. ✖

Physics

Section Id :	210688183
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 : 2106889257 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 : 2106889258 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/sec²

3. ✔ metre/sec³

4. ✖ metre

Question Number : 53 Question Id : 2106889259 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 : 2106889260 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 : 2106889261 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 : 2106889262 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 $g = 10 \text{ ms}^{-2}$)

Options :

1. ✓ 57.1m

2. ✗ 28.26m

3. ✖ 64m

4. ✖ 45m

Question Number : 57 Question Id : 2106889263 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 : 2106889264 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 : 2106889265 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 : 2106889266 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 : 2106889267 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 : 2106889268 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 : 2106889269 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 : 2106889270 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 : 2106889271 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 $g = 10 \text{ ms}^{-2}$)

Options :

1. ✓ 0.25m

2. ✗ 0.5m

3. ✗ 0.75m

4. ✗ 1m

Question Number : 66 Question Id : 2106889272 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 : 2106889273 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 : 2106889274 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 $100 \times 30 \times 10 \text{ m}^3$ 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 : 2106889275 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 : 2106889276 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 : 2106889277 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 $\frac{2}{5}$ 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 : 2106889278 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 : 2106889279 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 : 2106889280 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 : 2106889281 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 :	210688184
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 : 2106889282 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 : 2106889283 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 : 2106889284 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 : 2106889285 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 : 2106889286 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 : 2106889287 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 ($\text{K} = 39\text{u}$, $\text{Cl} = 35.5\text{ u}$, $\text{O} = 16\text{u}$)

Options :

1. ✔ 1.225

2. ✖ 2.45

3. ✖ 3.225

4. ✖ 1.205

Question Number : 82 Question Id : 2106889288 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 : 2106889289 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 ($\text{Na} = 23\text{u}$, $\text{C} = 12\text{u}$, $\text{O} = 16\text{u}$)

Options :

1. ✖ 0.5 N

2. ✖ 3 N

3. ✖ 2 N

4. ✔ 1 N

Question Number : 84 Question Id : 2106889290 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 : 2106889291 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 , 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 : 2106889292 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. ✖ H₂SO₄(aq)

3. ✖ CH₃COONa(aq)

4. ✔ NH₄OH(aq)

Question Number : 87 Question Id : 2106889293 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 $\text{CuSO}_4 = 63.5\text{u}$)

Options :

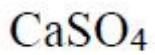
1. ✖ 63.5
2. ✖ 16.35
3. ✔ 15.875
4. ✖ 31.75

Question Number : 88 Question Id : 2106889294 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. ✖

Question Number : 89 Question Id : 2106889295 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 emf of the cell $\text{Zn}|\text{Zn}^{2+}(1\text{M})||\text{Cu}^{2+}(1\text{M})|\text{Cu}$ is ____

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

Options :

1. ✔ 1.1 V

2. ✖ -0.46 V

3. ✖ -1.1 V

4. ✖ 1.5 V

Question Number : 90 Question Id : 2106889296 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 : 2106889297 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 $\text{Ca}(\text{HCO}_3)_2$ (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 : 2106889298 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. ✗ -NH₃OH group
4. ✗ -Al₂Si₂O₈ group

Question Number : 93 Question Id : 2106889299 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. ✓ A chemical process

An electrochemical process

4. ✖ A physical process

Question Number : 94 Question Id : 2106889300 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 : 2106889301 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 : 2106889302 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

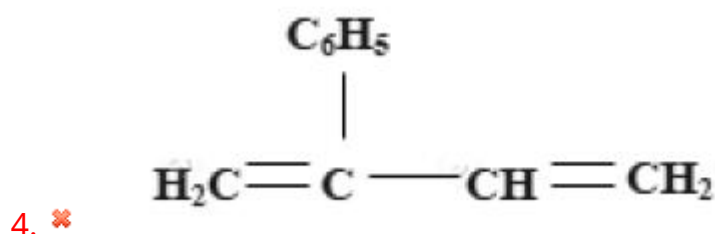
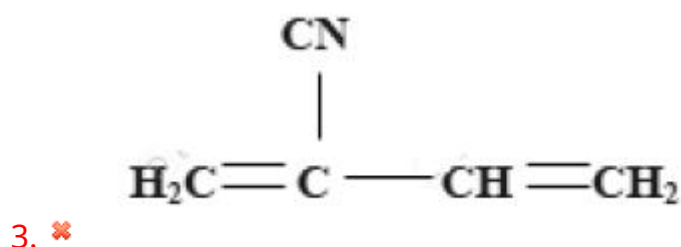
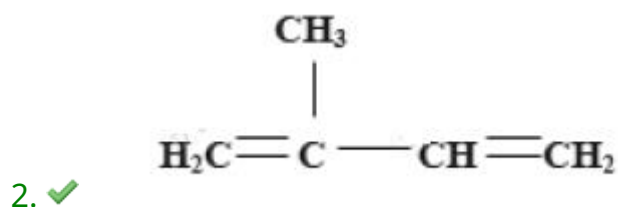
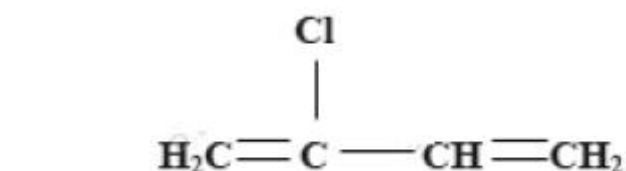
3. ✔ C_2F_4

4. ✖ C_2F_6

Question Number : 97 Question Id : 2106889303 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 :



Question Number : 98 Question Id : 2106889304 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, H₂

2. ✔ CO, N₂

3. ✖ CH₄, CO

4. ✖ CH₄, N₂

Question Number : 99 Question Id : 2106889305 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 : 2106889306 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

Metallurgical Engineering

Section Id :	210688185
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 : 2106889307 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A process by which particles of different sizes and specific gravities are sorted out into uniform groups is known as _____

Options :

1. ✖ Separation
2. ✔ Classification
3. ✖ Concentration
4. ✖ Capacity

Question Number : 102 Question Id : 2106889308 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 basis of separation of 'screening' process?

Options :

1. ✔ Particle size
- 2.

✖ Particle weight

3. ✖ Particle mass

4. ✖ Particle shape

Question Number : 103 Question Id : 2106889309 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 processes is not a part of Pyrometallurgy?

Options :

1. ✖ Calcination

2. ✖ Roasting

3. ✖ Smelting

4. ✔ Leaching

Question Number : 104 Question Id : 2106889310 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which metal is extracted by leaching ?

Options :

1. ✖ Copper
2. ✖ Steel
3. ✖ Sulphur
4. ✔ Gold

Question Number : 105 Question Id : 2106889311 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 process used to extract sodium from halide ores such as sodium chloride(NaCl)?

Options :

1. ✖ Pyro metallurgy
2. ✖ Hydro metallurgy
3. ✔ Electro metallurgy
4. ✖ Magnetic separation

Question Number : 106 Question Id : 2106889312 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 role of a reducing agent in the extraction of metals?

Options :

1. ✖ To oxidize the metal
2. ✖ To increase the metal's melting point
3. ✖ To remove impurities from the ore
4. ✔ To donate electrons and reduce metal compounds to metals

Question Number : 107 Question Id : 2106889313 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Coal rank denotes_____ of coal.

Options :

1. ✖ Classification
2. ✔ Maturity

3. ✖ Chemical composition

4. ✖ Analysis

Question Number : 108 Question Id : 2106889314 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dry quenching of coke aims at recovering _____ of coke.

Options :

1. ✔ Sensible heat

2. ✖ Blending

3. ✖ Preheating

4. ✖ Briquettes

Question Number : 109 Question Id : 2106889315 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water gas mainly consists of _____

Options :

1. ✓ H_2 & CO

2. ✗ CH_4 & N_2

3. ✗ N_2 & CO

4. ✗ N_2 & H_2

Question Number : 110 Question Id : 2106889316 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following coke types which coke has the highest purity ?

Options :

1. ✗ Beehive

2. ✗ Foundry

3. ✗ L T coke

4. ✓ Petroleum coke

Question Number : 111 Question Id : 2106889317 Display Question Number : Yes Is Question

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

Radiation pyrometer works based on _____law

Options :

- 1. ✖ Fourier
- 2. ✖ Plank
- 3. ✔ Stefan-Boltzmann
- 4. ✖ Thomson

Question Number : 112 Question Id : 2106889318 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 entropy of the system at equilibrium state?

Options :

- 1. ✖ Zero
- 2. ✖ Minimum
- 3. ✔ Maximum

4. ✖ Constant but not maximum

Question Number : 113 Question Id : 2106889319 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$PV^\gamma = \text{constant}$ is valid for ----- process

Options :

1. ✖ Isothermal

2. ✖ Isentropic

3. ✖ Isobaric

4. ✔ Adiabatic

Question Number : 114 Question Id : 2106889320 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Enthalpy H is defined as

Options :

1. ✖ $H = E - PV$

2.

✖ $H = F - TS$

3. ✔ $H = E + PV$

4. ✖ $H = P + TS$

Question Number : 115 Question Id : 2106889321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equation $PV = nRT$ is best obeyed by gases at

Options :

1. ✔ Low pressure and high temperature

2. ✖ High pressure and low temperature

3. ✖ Low pressure and low temperature

4. ✖ High pressure and high temperature

Question Number : 116 Question Id : 2106889322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Second law of thermodynamics is concerned with the

Options :

1. ✖ Amount of energy transferred
2. ✔ Direction of energy transfer
3. ✖ Irreversible process only
4. ✖ Non cyclic process only

Question Number : 117 Question Id : 2106889323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Number of components(C), phases (P), and degrees of freedom (F) are related by Gibbs rule

Options :

1. ✔ $P+F-C=2$
2. ✖ $C=P-F+2$
3. ✖ $F=C-P-2$
4. ✖

$$P=F-C-2$$

Question Number : 118 Question Id : 2106889324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Constant 'A' in Arrhenius equation is called

Options :

1. ✖ Rate constant
2. ✔ Arrhenius factor
3. ✖ Activity constant
4. ✖ Equilibrium Constant

Question Number : 119 Question Id : 2106889325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At triple point (for one component system) vapor pressure of solid as compared to that of Liquid will be

Options :

1. ✖ More

2. ✖ Less
3. ✔ Same
4. ✖ Depends on system

Question Number : 120 Question Id : 2106889326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Crystal Structure of Cementite

Options :

1. ✖ FCC
2. ✖ BCC
3. ✔ Orthorhombic
4. ✖ Tetragonal

Question Number : 121 Question Id : 2106889327 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 an age hardening alloy?

Options :

1. ✖ Al-Cu
2. ✖ Al-Mg-Si
3. ✔ Cu-Ni
4. ✖ β titanium alloys

Question Number : 122 Question Id : 2106889328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Mg_2Si is an example of

Options :

1. ✖ Alloy
2. ✖ Electron Compound
3. ✔ Interstitial Compound
4. ✖ Ceramic

Question Number : 123 Question Id : 2106889329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The atomic packing factor for the diamond cubic structure is

Options :

1. ✖ 0.74

2. ✖ 0.68

3. ✔ 0.34

4. ✖ 0.25

Question Number : 124 Question Id : 2106889330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Relative amounts of phases in a region can be deduced using

Options :

1. ✖ Phase rule

2. ✔ Lever rule

3. ✖ Normality

4. ✖ Mole fraction

Question Number : 125 Question Id : 2106889331 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Maximum solubility of carbon in austenite phase at 1147°C is

Options :

1. ✖ 0.02 %

2. ✖ 4.3 %

3. ✔ 2.1%

4. ✖ 0.5%

Question Number : 126 Question Id : 2106889332 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 Curie temperature in Iron-Iron carbide phase diagram?

Options :

1. ✖ 727⁰ C

2. ✔ 768⁰ C

3. ✖ 910⁰ C

4. ✖ 1258⁰ C

Question Number : 127 Question Id : 2106889333 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Time temperature transformation diagrams are drawn for

Options :

1. ✖ Iron

2. ✖ Manganese

3. ✖ Any alloy

4. ✔ Only steel

Question Number : 128 Question Id : 2106889334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the primary element used for making stainless steel alloy?

Options :

1. ✓ Chromium

2. ✗ Zirconium

3. ✗ Vanadium

4. ✗ Indium

Question Number : 129 Question Id : 2106889335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Graphite flakes are present in _____ Cast iron

Options :

1. ✗ White

2. ✓ Grey

3. ✖ Malleable

4. ✖ Nodular

Question Number : 130 Question Id : 2106889336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Alloy containing copper, tin, and zinc is known as

Options :

1. ✔ Gunmetal

2. ✖ Bronze

3. ✖ Brass

4. ✖ Cupro-nickel

Question Number : 131 Question Id : 2106889337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process used to eliminate retained austenite is

Options :

- 1. ✖ Martempering
- 2. ✖ Austempering
- 3. ✔ Sub-zero treatment
- 4. ✖ Patenting

Question Number : 132 Question Id : 2106889338 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 processes is used to reduce the brittleness of hardened steel?

Options :

- 1. ✖ Annealing
- 2. ✖ Normalizing
- 3. ✖ Spheroidizing
- 4. ✔ Tempering

Question Number : 133 Question Id : 2106889339 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 formed less when cooling rate is decreased?

Options :

- 1. ✖ Pearlite
- 2. ✖ Fine pearlite
- 3. ✖ Bainite
- 4. ✔ Martensite

Question Number : 134 Question Id : 2106889340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match the following and choose right option

- | | |
|---------------------------------------|---|
| P. Annealing | 1.Coarse pearlite |
| Q. Normalising | 2.Fine pearlite |
| R.Subcritical annealing for long time | 3. Tempered Martensite |
| S. Martempering | 4.Spherodised cementite in ferrite matrix |

Options :

- 1. ✖ P-1, Q-4, R-3, S-2

2. ✖ P-2, Q-3, R-1, S-4

3. ✖ P-4, Q-1, R-2, S-3

4. ✔ P-1, Q-2, R-4, S-3

Question Number : 135 Question Id : 2106889341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Assertion: Hardneability of steel can be increased by adding certain alloying elements

Reason: The alloying elements can provide a fine dispersion of alloy carbides

Options :

1. ✔ Both Assertion and Reason are true but reason is not a correct explanation for assertion

2. ✖ Both Assertion and Reason are false

3. ✖ Both Assertion and Reason are true, reason is correct explanation for Assertion

4. ✖ Assertion is true but reason is false

Question Number : 136 Question Id : 2106889342 Display Question Number : Yes Is Question

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

In Jomminy End Quench Test as the distance from the sample to water jet increases Hardenability

Options :

1. ✖ Remains same
2. ✖ Increases initially then decreases
3. ✔ Decreases
4. ✖ Increases

Question Number : 137 Question Id : 2106889343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Arrange the following in terms of increasing severity of quench

- P. Oil quenching
- Q. Water quenching
- R. Water quenching with violent agitation
- S. Brine quenching

Options :

1. ✔ $P < Q < R < S$
2. ✖

$$Q < R < P < S$$

3. ✖ $P < Q < S < R$

4. ✖ $Q < P < R < S$

Question Number : 138 Question Id : 2106889344 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an isothermal curve, which of the following is true when the temperature is increased?

Options :

1. ✔ The curve shifts rightward

2. ✖ The curve shifts leftward

3. ✖ The curve goes down

4. ✖ The curve goes up

Question Number : 139 Question Id : 2106889345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bainite has

Options :

1. ✖ The same morphology as austenite
2. ✔ A non lamellar morphology of ferrite and cementite
3. ✖ The coarsest morphology among all the products from austenite
4. ✖ Needle like structure

Question Number : 140 Question Id : 2106889346 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 deforming the steel at liquid nitrogen temperature is

Options :

1. ✖ Ausforming
2. ✔ Cryoforming
3. ✖ Tempering
- 4.

✖ Austenizing

Question Number : 141 Question Id : 2106889347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ is not a thermo mechanical treatment

Options :

1. ✔ Austempering

2. ✖ Cryoforming

3. ✖ Ausforming

4. ✖ Isoforming

Question Number : 142 Question Id : 2106889348 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 phase will be resulted when the transformation temperature of steel is in the range of 100 °C to 300 °C?

Options :

1. ✖ Austenite

2. ✖ Pearlite
3. ✖ Bainite
4. ✔ Martensite

Question Number : 143 Question Id : 2106889349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum temperature attained in steel melting shop furnace of either type is not more than _____ degree Celsius

Options :

1. ✖ 1300
2. ✖ 1500
3. ✔ 1800
4. ✖ 1700

Question Number : 144 Question Id : 2106889350 Display Question Number : Yes Is Question

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

With increase in steel melting furnace temperature, the slag viscosity

Options :

1. ✖ Increases
2. ✔ Decreases
3. ✖ Remains same
4. ✖ May increase or decrease, depends on the slag composition

Question Number : 145 Question Id : 2106889351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tap to tap time is the maximum in the case of

Options :

1. ✖ L.D converter
2. ✖ Kaldo process
3. ✔ Bessemer converter

Open hearth

4. ✖

Question Number : 146 Question Id : 2106889352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which among these is not an autogenous process?

Options :

1. ✖ L.D converter

2. ✔ Open hearth

3. ✖ Bessemer converter

4. ✖ Basic oxygen furnace

Question Number : 147 Question Id : 2106889353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Slag basicity is the ratio of

Options :

1. ✖ SiO_2 to CaO

2. ✖ Cao to SiO₂

3. ✔ Basic to acid oxides

4. ✖ Acidic to basic oxides

Question Number : 148 Question Id : 2106889354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a basic steel making furnace, the

Options :

1. ✔ Refractory lining is basic in nature and Flux used is necessarily basic

2. ✖ Slag is highly acidic in nature.

3. ✖ Flux used is necessarily basic

4. ✖ Flux used is necessarily acidic

Question Number : 149 Question Id : 2106889355 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 stopping the furnace operation at the end of its campaign life is called

Options :

- 1. ✖ Fanning
- 2. ✖ Coke rush
- 3. ✔ Blowing out
- 4. ✖ Blowing in

Question Number : 150 Question Id : 2106889356 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum heat generated in the Blast furnace is due to

Options :

- 1. ✔ Reaction of Oxygen with Carbon
- 2. ✖ Burners
- 3. ✖ Blast furnace design
- 4. ✖

Reaction of gaunge with dolomite

Question Number : 151 Question Id : 2106889357 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A large amount of material that gets stuck to the furnace wall apparently as a single block, mostly in top portion of bosh is called ____?

Options :

- 1. ✖ Hanging
- 2. ✔ Scaffolding
- 3. ✖ Slipping
- 4. ✖ Chilled hearth

Question Number : 152 Question Id : 2106889358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How can channeling in a blast furnace be avoided?

Options :

- 1. ✖ Using fines as charge material

Having a good permeability of the bed through uniform burden distribution

2. ✓

3. ✗ Using lump ores for high bed permeability

Having a high blast pressure

4. ✗

Question Number : 153 Question Id : 2106889359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

High top pressure_____ the coke rate.

Options :

1. ✗ Increases

2. ✓ Decreases

3. ✗ No impact

4. ✗ Initially increases and then decreases

Question Number : 154 Question Id : 2106889360 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Reduction ratio of hematite is _____ than that of magnetite

Options :

1. ✖ Faster
2. ✔ Slower
3. ✖ Equal
4. ✖ Very Faster

Question Number : 155 Question Id : 2106889361 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Copper smelting is carried out at a temperature of _

Options :

1. ✔ 1200°C
2. ✖ 1300°C
3. ✖ 850°C
4. ✖

1300°C

Question Number : 156 Question Id : 2106889362 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Parke's process is used for the elimination of

Options :

1. ✖ Copper from Silver

2. ✖ Lead from Zinc

3. ✔ Lead from Silver

4. ✖ Iron from Silver

Question Number : 157 Question Id : 2106889363 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 bauxite is

Options :

1. ✔ Al_2O_3

2. ✖ $\text{Al}_2(\text{SO}_4)_3$

3. ✖ CaSO_4

4. ✖ Na_3AlF_6

Question Number : 158 Question Id : 2106889364 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 are the ores of zinc?

Options :

1. ✔ Calamine and zinc blend

2. ✖ Zinc blend and cerussite

3. ✖ Calomine and siderate

4. ✖ Zinc blend and carnallite

Question Number : 159 Question Id : 2106889365 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ternary alloy that is produced in Pidgeon process is

Options :

1. ✖ Ca-Si-Fe
2. ✔ Ca-Si-Mg
3. ✖ Ca-Fe-Mg
4. ✖ Fe-Si-Mg

Question Number : 160 Question Id : 2106889366 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 an ore of magnesium?

Options :

1. ✖ Carnallite
2. ✖ Magnesite
3. ✖ Dolomite
4. ✔ Gypsum

Question Number : 161 Question Id : 2106889367 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The binder that is used as a catalyst for preferential chlorination of Ilmenite is

Options :

1. ✖ Asphalt
2. ✖ Tar
3. ✖ Starch
4. ✔ Ferric chloride

Question Number : 162 Question Id : 2106889368 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Common mineral of Zircon is?

Options :

1. ✖ $\text{Al}_2(\text{SO}_4)_3$
2. ✔ ZrSiO_4

3. ✖ ZrSiO

4. ✖ ZrSi

Question Number : 163 Question Id : 2106889369 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 ore of Thorium?

Options :

1. ✖ Carnallite

2. ✖ Magnesite

3. ✖ Dolomite

4. ✔ Monazite

Question Number : 164 Question Id : 2106889370 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The theoretical percentage of alumina in gibbsite is

Options :

1. ✔

65.4

2. ✖ 85.4

3. ✖ 75.4

4. ✖ 55.4

Question Number : 165 Question Id : 2106889371 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 the material to resist stress without failure is called

Options :

1. ✔ Strength

2. ✖ Hardness

3. ✖ Toughness

4. ✖ Stiffness

Question Number : 166 Question Id : 2106889372 Display Question Number : Yes Is Question

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

What are the metal requirements to have creep resistance property?

Options :

1. ✖ Low melting point
2. ✔ High Oxidation resistance
3. ✖ Low Oxidation resistance
4. ✖ Brittleness

Question Number : 167 Question Id : 2106889373 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The indenter used in Brinell hardness test is a

Options :

1. ✔ Steel Ball
2. ✖ Diamond cone
3. ✖ Diamond pyramid

4. ✖ Steel cylinder

Question Number : 168 Question Id : 2106889374 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Pyramid type diamond indenter is used in

Options :

1. ✖ Brinell hardness tester

2. ✖ Rockwell hardness tester

3. ✔ Vickers hardness tester

4. ✖ Rebound hardness tester

Question Number : 169 Question Id : 2106889375 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Permanent deformation of material with respect to time due to constant load and variable temperature is

Options :

1. ✖ Elasticity

2. ✖ Hardness

3. ✖ Strength

4. ✔ Creep

Question Number : 170 Question Id : 2106889376 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 types of rays are used in radiography for the inspection of castings?

Options :

1. ✔ X- rays

2. ✖ Infrared rays

3. ✖ Ultraviolet rays

4. ✖ Visible ray

Question Number : 171 Question Id : 2106889377 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 methods of NDT requires leak proofing of casting before inspection?

Options :

1. ✖ Impact test
2. ✖ Visual inspection
3. ✖ Sound test
4. ✔ Pressure test

Question Number : 172 Question Id : 2106889378 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 terms changes in the eddy current testing method for the detection of defects?

Options :

1. ✖ Resistance
2. ✖ Impedance
3. ✔ Conductivity
4. ✖ Capacitance

Question Number : 173 Question Id : 2106889379 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 true for metals?

Options :

1. ✖ Twin boundary energy > grain boundary energy > surface energy
2. ✖ Grain boundary energy > twin boundary energy > surface energy
3. ✔ Surface energy > grain boundary energy > twin boundary energy
4. ✖ Twin boundary energy > surface energy > grain boundary energy

Question Number : 174 Question Id : 2106889380 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A truly sessile dislocation in a F.C.C material is

Options :

1. ✖ Shockley partial
2. ✖ Lomer dislocation

3. ✓ Frank partial

4. ✗ lomer-cottrell dislocation

Question Number : 175 Question Id : 2106889381 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Usually Hot working of metal is carried out at temperature ____ of Melting Temperature (T_m)

Options :

1. ✗ $0.2T_m$

2. ✓ $0.6 T_m$

3. ✗ $0.4 T_m$

4. ✗ $1.2 T_m$

Question Number : 176 Question Id : 2106889382 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The strain in hot working is.

Options :

1.

✓ 0.5- 1

2. ✗ 1-2

3. ✗ 2-4

4. ✗ 4.5-8.5

Question Number : 177 Question Id : 2106889383 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Driving force for grain growth after completion of recrystallization is

Options :

1. ✓ Stored energy of cold work

2. ✗ Vacancy concentration

3. ✗ Dislocation density in the crystal

4. ✗ Grain boundary curvature

Question Number : 178 Question Id : 2106889384 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Movement of jogs can produce

Options :

1. ✓ Vacancies
2. ✗ Interstitial
3. ✗ Grain boundary sliding
4. ✗ Grain boundary migration

Question Number : 179 Question Id : 2106889385 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Region of disorder created by movement of dislocations in superlattice is called

Options :

1. ✗ Twin
2. ✗ Stacking fault
3. ✓ Anti-phase boundary

Orowon loop

4. ✖

Question Number : 180 Question Id : 2106889386 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 articles cannot be made from rolling?

Options :

Rails

1. ✖

Cups

2. ✔

Bars

3. ✖

Plates

4. ✖

Question Number : 181 Question Id : 2106889387 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 belongs to sheet metal forming?

Options :

Deep drawing

1. ✔

2. ✖

Rolling

3. ✖ Forging

4. ✖ Extrusion

Question Number : 182 Question Id : 2106889388 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 atomization process very high purity powders are obtained ?

Options :

1. ✖ Water atomization

2. ✔ Gas atomization

3. ✖ Vacuum atomization

4. ✖ Centrifugal atomization

Question Number : 183 Question Id : 2106889389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For shell moulding, the sand should have a GFN of _____ approximately

Options :

1. ✖ 35
2. ✖ 25-50
3. ✔ 50-100
4. ✖ 15

Question Number : 184 Question Id : 2106889390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sand mass does not fall out of the moulding box but is held firmly in it when the moulding box is lifted. This is due to the property of _____

Options :

1. ✖ Porosity of sand
2. ✔ Adhesiveness of sand
3. ✖ Refractoriness of sand
4. ✖ Plasticity of sand

Question Number : 185 Question Id : 2106889391 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The material which is responsible for strength of the mould in CO₂ moulding process is

Options :

1. ✓ Silica grains
2. ✗ Silica gel
3. ✗ Molasses
4. ✗ Zirconia

Question Number : 186 Question Id : 2106889392 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The chief advantage of die-casting is

Options :

1. ✗ Possibility of incorporating thick section in small castings
2. ✗ Casting of inserts is possible

Wide tolerances are possible

3. ✖

High production rates are possible

4. ✔

Question Number : 187 Question Id : 2106889393 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Addition of saw dust to moulding sand increases its

Options :

Gas permeability

1. ✔

Refractoriness

2. ✖

Cohesiveness

3. ✖

Strength

4. ✖

Question Number : 188 Question Id : 2106889394 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Volumetric shrinkage of grey cast iron is about .

Options :

1. ✖ 3-4%
2. ✖ 6%
3. ✔ 1.9% or negative
4. ✖ 4-6%

Question Number : 189 Question Id : 2106889395 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The expandable pattern is used in _____ operation.

Options :

1. ✔ Investment casting
2. ✖ Centrifugal casting
3. ✖ Slush casting
4. ✖ Squeeze casting

Question Number : 190 Question Id : 2106889396 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

_____ allowance is not provided in the disposable pattern

Options :

- 1. ✘ Distortion
- 2. ✘ Shrinkage
- 3. ✘ Draft
- 4. ✔ Machining

Question Number : 191 Question Id : 2106889397 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In sand moulding the bottom most part of the flask is called.

Options :

- 1. ✘ Cope
- 2. ✘ Cheek
- 3. ✔ Drag

4. ✖ Flask bottom

Question Number : 192 Question Id : 2106889398 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sodium silicate in sand is often used as

Options :

1. ✖ Substitute of moisture

2. ✔ Permeability promotion agent

3. ✖ Refractory material

4. ✖ Binder

Question Number : 193 Question Id : 2106889399 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The longitudinal shell of a boiler shell is always a

Options :

1. ✔ Lap joint

2. ✖ Butt joint

3. ✖ Lozenge joint

4. ✖ Diamond joint

Question Number : 194 Question Id : 2106889400 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 can be easily be welded from flash butt welding process?

Options :

1. ✖ Tin

2. ✖ Lead

3. ✖ Cast irons

4. ✔ Carbon steel

Question Number : 195 Question Id : 2106889401 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Electrodes used in spot welding are made up of which material?

Options :

1. ✓ ☒ Copper or copper alloys
2. ✗ ☐ Tungsten or tungsten alloys
3. ✗ ☐ Chromium or chromium alloys
4. ✗ ☐ Titanium or titanium alloys

Question Number : 196 Question Id : 2106889402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following for which material TIG welding is best suited ?

Options :

1. ✗ ☐ Stainless steel
2. ✗ ☐ Carbon steel
3. ✗ ☐ Silver
4. ✓ ☒ Aluminum

Question Number : 197 Question Id : 2106889403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Typically, the temperature of the positive electrode in metal arc welding can reach up to approximately

Options :

1. ✖ 1300°C
2. ✔ 2400°C
3. ✖ 1500°C
4. ✖ 3600°C

Question Number : 198 Question Id : 2106889404 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 defects occur when the deposited metal is not focused on the root of weld?

Options :

1. ✖ Inclusion of slag
2. ✔ Inadequate penetration

3. ✖ Incomplete fusion

4. ✖ Porosity

Question Number : 199 Question Id : 2106889405 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 defects occur due to melting or burning away of base metal?

Options :

1. ✔ Undercut

2. ✖ Spatter

3. ✖ Cracking in weld metal

4. ✖ Cold cracking

Question Number : 200 Question Id : 2106889406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Copper and aluminum can be joined by brazing when _____ alloy is used.

Options :

1. ✖

Copper-zinc

2. ✓ Aluminum-silicon

3. ✗ Copper-tellurium

4. ✗ Aluminum-zinc