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

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

Mathematics

Section Id :	418099388
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 : 41809919403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 2 Question Id : 41809919404 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 3 Question Id : 41809919405 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $|A|^{n-1}$

2. ✖ $|A|^{n}$

3. ✖ $|A|$

4. ✖ $\frac{1}{|A|}$

Question Number : 4 Question Id : 41809919406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 5 Question Id : 41809919407 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -1

2. ✔ 0

3. ✖ 2

4. ✖ 1

Question Number : 6 Question Id : 41809919408 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -1

2. ✖ 0

3.

✔ 2

4. ✖ 1

Question Number : 7 Question Id : 41809919409 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -2

2. ✖ 3

3. ✔ 5

4. ✖ 4

Question Number : 8 Question Id : 41809919410 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\frac{1-\cos x}{\sin x}$

2. ✔ $\frac{1+\cos x}{\sin x}$

3. ✖ $\frac{1+\sin x}{\cos x}$

4. ✖ $\frac{1-\sin x}{\cos x}$

Question Number : 9 Question Id : 41809919411 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 5

Question Number : 10 Question Id : 41809919412 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

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

Options :

1. ✖ $-\sqrt{3}$

2. ✔ $\sqrt{3}$

3. ✖ $\frac{1}{\sqrt{2}}$

4. ✖ $-\frac{1}{\sqrt{2}}$

Question Number : 11 Question Id : 41809919413 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $tan\ 3A\ \tan 2A\ \tan A$

2. ✖ $-\ tan\ 3A\ \tan 2A\ \tan A$

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

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

Question Number : 12 Question Id : 41809919414 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\frac{1}{16}$

2. ✔ $\frac{1}{8}$

3. ✖ $\frac{1}{2}$

4. ✖ 1

Question Number : 13 Question Id : 41809919415 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{-1}{3}\ or\ \frac{1}{2}$

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

3. ✖ $\frac{13}{12}$ *or* $\frac{1}{3}$

4. ✖ $\frac{5}{4}$ *or* $\frac{1}{2}$

Question Number : 14 Question Id : 41809919416 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

4. ✔ 3

Question Number : 15 Question Id : 41809919417 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

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

Options :

1. ✔ $\frac{1}{2}$

2. ✖ $-\frac{1}{2}$

3. ✖ 1

4. ✖ $\frac{3}{2}$

Question Number : 16 Question Id : 41809919418 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $0, \frac{\pi}{3}$

2. ✖ $0, \frac{\pi}{2}$

3. ✖ $1, \frac{\pi}{2}$

4. ✖ $2, \frac{\pi}{3}$

Question Number : 17 Question Id : 41809919419 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $-\pi$

2. ✔ π

3. ✖ $tan^{-1}\frac{4}{5}$

4. ✖ $-tan^{-1}\frac{4}{5}$

Question Number : 18 Question Id : 41809919420 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ (-3, 7)

2. ✖ (-4, 9)

3. ✔ (-4, 7)

4. ✖ (-3, 9)

Question Number : 19 Question Id : 41809919421 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 1

2. ✔ -1

3. ✖ 0

4. ✖ i

Question Number : 20 Question Id : 41809919422 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $bx - ay = 0$

2. ✖ $bx + ay = 0$

3. ✖ $ax - by = 0$

4. ✔ $x - y = 0$

Question Number : 21 Question Id : 41809919423 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 4

2. ✔ 5

3. ✖ 3

4. ✖ 2

Question Number : 22 Question Id : 41809919424 Display Question Number : Yes Is Question

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

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

Options :

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

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

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

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

Question Number : 23 Question Id : 41809919425 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $m = 1$

2. ✖ $m = 2$

3. ✖ $m = 3$

4. ✖ $m = 4$

Question Number : 24 Question Id : 41809919426 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 30^o

2. ✖ 45^o

3. ✖ 60^o

4. ✔ 90^o

Question Number : 25 Question Id : 41809919427 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $(\frac{32}{5}, \frac{3}{5})$

2. ✖

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

3. ✖ $(\frac{-32}{5}, \frac{3}{5})$

4. ✖ $(\frac{-32}{5}, \frac{-3}{5})$

Question Number : 26 Question Id : 41809919428 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\frac{1}{2}$

2. ✔ $\frac{-1}{2}$

3. ✖ 0

4. ✖ 1

Question Number : 27 Question Id : 41809919429 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 28 Question Id : 41809919430 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 0

2. ✔ 2

3. ✖ 1

4. ✖ 3

Question Number : 29 Question Id : 41809919431 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 0

2. ✖ $\frac{1}{\sqrt{3}}$

3. ✔ 1

4. ✖ $\sqrt{3}$

Question Number : 30 Question Id : 41809919432 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 3

2. ✖ -3

3. ✔ 2

4. ✖ -1

Question Number : 31 Question Id : 41809919433 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ e

2. ✔ $\frac{1}{e}$

3. ✖ 1

4. ✖ $e+1$

Question Number : 32 Question Id : 41809919434 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 13

2. ✖ 12

3. ✔ 11

4. ✖ 10

Question Number : 33 Question Id : 41809919435 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 34 Question Id : 41809919436 Display Question Number : Yes Is Question

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

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

Options :

1. ✔ 1

2. ✖ - 1

3. ✖ 2

4. ✖ 9

Question Number : 35 Question Id : 41809919437 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ (1, 27)

2. ✔ (-1, 27)

3. ✖ (-1, 29)

4. ✖ (-1, 25)

Question Number : 36 Question Id : 41809919438 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $e^x \sec x + c$

2. ✔ $e^x \tan x + c$

3. ✖ $e^x \cot x + c$

4. ✖ $e^x \operatorname{cosec} x + c$

Question Number : 37 Question Id : 41809919439 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\frac{\pi}{2}$

2. ✔ $\frac{\pi}{3}$

3. ✖ $\frac{\pi}{4}$

4. ✖ π

Question Number : 38 Question Id : 41809919440 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\log(2+\sqrt{3})$

2. ✖ $\log(2-\sqrt{3})$

3. ✖ $\log(1+\sqrt{3})$

4. ✖ $\log(1-\sqrt{3})$

Question Number : 39 Question Id : 41809919441 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{20}{3}$

2. ✖ $-\frac{20}{3}$

3. ✖ $\frac{10}{3}$

4. ✖ $\frac{15}{3}$

Question Number : 40 Question Id : 41809919442 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\log(e^x + e^{-x}) + C$

2. ✔ $tan^{-1}e^x + C$

3. ✖ $\frac{1}{e^x+e^{-x}} + C$

4. ✖ $cot^{-1}e^x + C$

Question Number : 41 Question Id : 41809919443 Display Question Number : Yes Is Question

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

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

Options :

1. ✖ $-\frac{3}{4}$

2. ✖ $\frac{2}{3}$

3. ✔ $\frac{4}{3}$

4. ✖ $\frac{5}{4}$

Question Number : 42 Question Id : 41809919444 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $-\frac{\pi}{2}$

2. ✔ 0

3. ✖ 1

4. ✖ $\frac{\pi}{2}$

Question Number : 43 Question Id : 41809919445 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 44 Question Id : 41809919446 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ Zero

2. ✖ One

3. ✔ Two

4. ✖ Three

Question Number : 45 Question Id : 41809919447 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\log(x+y) = c$

2. ✔ $\log(x^2+y^2) = c$

3. ✖ $\log(xy) = c$

4. ✖ $\log(x-y) = c$

Question Number : 46 Question Id : 41809919448 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{1}{x+1}$

2. ✖ $x+1$

3. ✖ $\frac{1}{x^2+1}$

4. ✖ x^2+1

Question Number : 47 Question Id : 41809919449 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

4. ✖

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

Question Number : 48 Question Id : 41809919450 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $4xy = x^3 + 3$

2. ✔ $4xy = x^4 + 3$

3. ✖ $4xy = y^3 + 3$

4. ✖ $4xy = y^4 + 3$

Question Number : 49 Question Id : 41809919451 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 50 Question Id : 41809919452 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Physics

Section Id :	418099389
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 : 41809919453 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

then the dimensions of mass are

Options :

1. ✔ $[FV^{-1}T]$

2. ✖ $[FVT^{-1}]$

3. ✖ $[FV^{-1}T^{-1}]$

4. ✖ $[FVT^{-2}]$

Question Number : 52 Question Id : 41809919454 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ be halved

2. ✖ be doubled

3. ✔ be quadrupled

4. ✖ remain unaffected.

Question Number : 53 Question Id : 41809919455 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\sqrt{157}$

2. ✖ $\sqrt{112}$

3. ✖ $\sqrt{213}$

4. ✖ $9\sqrt{3}$

Question Number : 54 Question Id : 41809919456 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\text{Cos}^{-1}(-1/3)$

2. ✖ $\text{Cos}^{-1}(-2/3)$

3. ✔ $\text{Cos}^{-1}(1/\sqrt{3})$

4. ✖ $\text{Cos}^{-1}(2/3)$

Question Number : 55 Question Id : 41809919457 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖

Q

2. ✔ P

3. ✖ S

4. ✖ R

Question Number : 56 Question Id : 41809919458 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ Equal to

2. ✖ Greater than

3. ✔ Smaller than

4. ✖ Some times greater and some times smaller than

Question Number : 57 Question Id : 41809919459 Display Question Number : Yes Is Question

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

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

Options :

1. ✖ $2.5\ ms^{-1}$

2. ✔ $5\ ms^{-1}$

3. ✖ $10\ ms^{-1}$

4. ✖ $20\ ms^{-1}$

Question Number : 58 Question Id : 41809919460 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 15 kg

2. ✖ 20 kg

3. ✖ 10 kg

4. ✔ 5 kg

Question Number : 59 Question Id : 41809919461 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\theta = \tan^{-1} 4$

2. ✖ $\theta = \tan^{-1}(1/4)$

3. ✖ $\theta = \tan^{-1} 2$

4. ✖ $\theta = 45^0$

Question Number : 60 Question Id : 41809919462 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

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

at t=2s is

Options :

1. ✖ $10ms^{-2}$

2. ✖ $8ms^{-2}$

3. ✔ $4ms^{-2}$

4. ✖ $15ms^{-2}$

Question Number : 61 Question Id : 41809919463 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

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

Options :

1. ✔ 115 J

2. ✖ 110 J

3. ✖ 250 J

4. ✖ 270 J

Question Number : 62 Question Id : 41809919464 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ -250 J

2. ✔ -750 J

3. ✖ -500 J

4. ✖ -300 J

Question Number : 63 Question Id : 41809919465 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ 0.0195 W

2. ✖ 0.1950 W

3. ✖ 19.50 W

4. ✖ 9.50 W

Question Number : 64 Question Id : 41809919466 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ proportionality between acceleration and velocity

2. ✔ proportionality between restoring force and displacement

3. ✖ constant time period

4. ✖ constant acceleration

Question Number : 65 Question Id : 41809919467 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 66 Question Id : 41809919468 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ 100 cm

2. ✖ 98 cm

3. ✖ 98 m

4. ✖ 100 m

Question Number : 67 Question Id : 41809919469 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $\frac{1}{2}$ Sec

2. ✔ 2 Sec

3. ✖ $\frac{1}{4}$ Sec

4. ✖ 4 Sec

Question Number : 68 Question Id : 41809919470 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 1500 Hz

2. ✖ 250 Hz

3. ✖ 750 Hz

4. ✔ 500 Hz

Question Number : 69 Question Id : 41809919471 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Every gas behaves as an ideal gas at

Options :

1. ✖ high temperature and high pressure

2. ✖ Low temperature and low pressure

3. ✔ High temperature and low pressure

4. ✖

High pressure and low temperature

Question Number : 70 Question Id : 41809919472 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $1x10^4 J$

2. ✖ $3x10^4 J$

3. ✔ $5x10^4 J$

4. ✖ $4x10^4 J$

Question Number : 71 Question Id : 41809919473 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔

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

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

3. $\frac{dv}{v}$

4. $-\gamma^2\frac{dv}{v}$

Question Number : 72 Question Id : 41809919474 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. 680 Joule

2. 680 erg

3. 860 Joule

4.

-860 Joule

Question Number : 73 Question Id : 41809919475 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 627 K

2. ✔ 900 K

3. ✖ 300 K

4. ✖ 427 K

Question Number : 74 Question Id : 41809919476 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ equal to $\frac{10}{h}$

2. ✖ greater than $\frac{10}{h}$

3. ✖ less than $\frac{10}{h}$

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

Question Number : 75 Question Id : 41809919477 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Superconducting material exhibits

Options :

1. ✖ zero conductivity & diamagnetism

2. ✖ zero resistivity & paramagnetism

3. ✖ infinite conductivity & paramagnetism

4. ✔ zero resistivity & diamagnetism

Chemistry

Section Id :	418099390
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 : 41809919478 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ 1.51 eV

2. ✖ 3.02 eV

3. ✖ 6.04 eV

4. ✖ 1.36 eV

Question Number : 77 Question Id : 41809919479 Display Question Number : Yes Is Question

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

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

Options :

1. ✖ $n = 4, l = 4, m = -4, s = -½$

2. ✖ $n = 3, l = 2, m = -2, s = +½$

3. ✖ $n = 4, l = 3, m = +4, s = -½$

4. ✔ $n = 4, l = 3, m = +1, s = +½$

Question Number : 78 Question Id : 41809919480 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

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

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

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

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

Question Number : 79 Question Id : 41809919481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Variable valency is shown by

Options :

1. ✖ s-block elements

2. ✖ s- and p- block elements

3. ✔ p- and d-block elements

4. ✖ All elements

Question Number : 80 Question Id : 41809919482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $(CH_3)_3CH$

2. ✖ CH_3COOH

3. ✖ CH_3CHO

4. ✖ CH_3COCH_3

Question Number : 81 Question Id : 41809919483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 8.9

2. ✖ 9.8

3. ✖ 19.6

4. ✔ 18.3

Question Number : 82 Question Id : 41809919484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 2.04

2. ✖ 1.68

3. ✖ 0.92

4. ✔ 1.73

Question Number : 83 Question Id : 41809919485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ The solution becomes unsaturated

2. ✔ The excess solute crystallizes out

3. ✖ The solute dissolves

4. ✖ The solution becomes saturated

Question Number : 84 Question Id : 41809919486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ H_2SO_4

2. ✖ $H_2S_2O_7$

3. ✔ $HS_2O_8^-$

4. ✖ $H_2S_2O_8$

Question Number : 85 Question Id : 41809919487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ (A) and (B)

2. ✔ (B) and (C)

3. ✖ (A) and (D)

4. ✖ (C) and (D)

Question Number : 86 Question Id : 41809919488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ SO_2 and O_2

2. ✖ SO_3 and H_2

3. ✔ O_2 and H_2

4. ✖ H_2 and O_2

Question Number : 87 Question Id : 41809919489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an electrolytic cell, flow of electrons is from

Options :

1. ✖ cathode to anode in solution

2. ✔ cathode to anode through external supply

3. ✖ cathode to anode through internal supply

4. ✖ anode to cathode through external supply

Question Number : 88 Question Id : 41809919490 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermodynamic efficiency of a cell is given by

Options :

1. ✔ $nFE/\Delta H$

2. ✖ $\Delta H/\Delta G$

3. ✖ $nFE/\Delta G$

4. ✖ nFE°

Question Number : 89 Question Id : 41809919491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 29.5×10^{-2}

2. ✖ 10

3. ✔ 10^{10}

4. ✖ 29.5×10^{10}

Question Number : 90 Question Id : 41809919492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the chemical formula of Calgon

Options :

1. ✔ $[Na(PO)_3]_6$

2. ✖ $[Ca_2(P_6O_{18})]^{2-}$

3. ✖ H_2CO_3

4. ✖ $Na_2CO_3+Ca(OH)_2$

Question Number : 91 Question Id : 41809919493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Alkalinity of water is due to the presence of _____

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

Options :

1. ✖ Only (A)

2. ✖ Both (A) and (B)

3. ✖ Both (B) and (C)

4. ✔ All the three (A), (B) and (C)

Question Number : 92 Question Id : 41809919494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brackish water means

Options :

1. ✖ Ground water

2. ✖ Fresh Water

3. ✖ River Water

4. ✔ Salt Water

Question Number : 93 Question Id : 41809919495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following two metals are corrosion resistant

Options :

1. ✖ Iron and Nickel

2. ✔ Nickel and Copper

3. ✖ Copper and Molybdenum

4. ✖ Iron and Molybdenum

Question Number : 94 Question Id : 41809919496 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coating which protects the base metal 'sacrificially' is

Options :

1. ✖ Metallic coating

2. ✔ Anodic coating

3. ✖

Metal oxide coating

4. ✖ Phosphate coating

Question Number : 95 Question Id : 41809919497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is also known as elastomers

Options :

1. ✖ PVC

2. ✖ Nylon 6,6

3. ✔ Synthetic rubber

4. ✖ Polycarbonate

Question Number : 96 Question Id : 41809919498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an inorganic polymer?

Options :

1. ✔ Silicone

2. ✖

Epoxy resin

3. ✖ Polyurethane

4. ✖ Teflon

Question Number : 97 Question Id : 41809919499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The termination step in the cationic polymerization is caused by

Options :

1. ✖ Free radical

2. ✖ cation

3. ✔ anion

4. ✖ carbene

Question Number : 98 Question Id : 41809919500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sulphur compounds from gasoline are removed by

Options :

1. ✖ Lead sulphate

2. ✖ Lead nitrate

3. ✖ Lead sulphide

4. ✔ Sodium plumbite

Question Number : 99 Question Id : 41809919501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fluoride pollution mainly affects

Options :

1. ✔ Teeth

2. ✖ Heart

3. ✖ Kidneys

4. ✖ Liver

Question Number : 100 Question Id : 41809919502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Silicosis is caused by

Options :

1. ✖ Acid rain

2. ✔ Inhalation of aerosols

3. ✖ Inhalation of sulphurdioxide

4. ✖ Depletion of ozone

Metallurgical Engineering

Section Id :	418099391
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 : 41809919503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An example of fine crushers is

Options :

1. ✔ Rod mill

2. ✖ Gyratory crushers

3. ✖ Cone crushers

4. ✖ Hammer Mill

Question Number : 102 Question Id : 41809919504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The energy required to grind a sample of materials is given by

Options :

1. ✖ Rittinger's law

2. ✖ Fick's law

3. ✔ Bond's work index

4. ✖ Kick's law

Question Number : 103 Question Id : 41809919505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore when subjected to grinding operation produces a product size less than 100 microns and the valuable particles are separated by

Options :

1. ✖ Density

2. ✖ Shape

3. ✖ Size

4. ✔ Magnetic property

Question Number : 104 Question Id : 41809919506 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 has passed the 20 mesh sieve but retained on the 24 mesh is designated as

Options :

1. ✖ -20-20

2. ✔ -20+24

3. ✖ +20+24

4. ✖ +20-24

Question Number : 105 Question Id : 41809919507 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The effectiveness of the screens is expressed as

Options :

1. ✔ Recovery x Rejection

2. ✖ Recovery - Rejection

3. ✖ Recovery/Rejection

4. ✖ Recovery + Rejection

Question Number : 106 Question Id : 41809919508 Display Question Number : Yes Is Question

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

Fine ore particles which are easily wetted by water have the nature of

Options :

1. ✖ Hydrostatic

2. ✖ Hydrophobic

3. ✔ Hydrophilic

4. ✖ Hydrophane

Question Number : 107 Question Id : 41809919509 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 the radius of atom(r) and lattice parameter(a) for

BCC crystal is

Options :

1. ✖ $r = 4a/\sqrt{3}$

2. ✔ $r = a\sqrt{3}/4$

3. ✖

$r = a\sqrt{3}/2$

$r = a/\sqrt{3}$

4. ✖

Question Number : 108 Question Id : 41809919510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Metallic bonds formed in materials are

Options :

Directional

1. ✖

Symmetrical

2. ✖

Circular

3. ✖

Non-directional

4. ✔

Question Number : 109 Question Id : 41809919511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The metal which is having FCC crystal structure is

Options :

1. ✖ Vanadium

2. ✖ Tungsten

3. ✖ Chromium

4. ✔ Silver

Question Number : 110 Question Id : 41809919512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The miller indices for the plane (2 1 1/2) in a crystal is

Options :

1. ✔ (1 2 4)

2. ✖ (4 2 1)

3. ✖ (1 4 2)

(4 1 2)

4. ✖

Question Number : 111 Question Id : 41809919513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is not the family of direction for <2 1 1> is

Options :

1. ✖ [2 1 1]

2. ✖ [2 1 -1]

3. ✖ [1 1 -2]

4. ✔ [1 1 0]

Question Number : 112 Question Id : 41809919514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following statements for binary solid solutions:

Statement (i): Size difference between the parent atom and solute atom should be more than 15%.

Statement (ii): Electronegativity between metals should be small

Options :

1. ✖ Statement (i) & (ii) are true

2. ✖ Statement (i) is true & Statement (ii) is false

3. ✔ Statement (i) is false & Statement (ii) is true

4. ✖ Statement (i) & (ii) are false

Question Number : 113 Question Id : 41809919515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The example of an electron compound is

Options :

1. ✔ CuZn

2. ✖ TiN

3. ✖ FeAl

4. ✖ Al_2O_3

Question Number : 114 Question Id : 41809919516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Perfect crystal that are totally free of dislocations is known as

Options :

1. ✖ Metals

2. ✖ Ceramics

3. ✔ Whiskers

4. ✖ Composites

Question Number : 115 Question Id : 41809919517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dislocation climb is observed in

Options :

1. ✖ Casting

2. ✖ Welding

3. ✔ Creep

4. ✖ Melting

Question Number : 116 Question Id : 41809919518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The splitting of dislocation (b_1) into two partial dislocations (b_2) and (b_3) is favoured energetically when

Options :

1. ✔ $b_1^2 > b_2^2 + b_3^2$

2. ✖ $b_1^2 < b_2^2 + b_3^2$

3. ✖ $b_1^2 = b_2^2 + b_3^2$

$b_1^2 \neq b_2^2 + b_3^2$

4. ✖

Question Number : 117 Question Id : 41809919519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tilt boundaries are formed during the process of

Options :

1. ✖ Quenching

2. ✖ Normalising

3. ✖ Hardening

4. ✔ Recovery

Question Number : 118 Question Id : 41809919520 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The composition of phases in binary phase diagram are determined by

Options :

1. ✔

Tie line rule

Phase rule

2. ✖

Composition rule

3. ✖

Drawing rule

4. ✖

Question Number : 119 Question Id : 41809919521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The size of atom (r = radius) that can fit in the tetrahedral void in FCC unit cell is

Options :

0.220r

1. ✖

0.249r

2. ✖

0.225r

3. ✔

0.280r

4. ✖

Question Number : 120 Question Id : 41809919522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When two solids phase combines to give a solid phase , then this invariant reaction is called as

Options :

Eutectic reaction

1. ✖

Eutectiod reaction

2. ✖

Peritectic reaction

3. ✖

Peritectiod reaction

4. ✔

Question Number : 121 Question Id : 41809919523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The treatment given to avoid coring in Isomorphous alloys is

Options :

1. ✔ Homogenizing treatment

2. ✖ Hardening treatment

3. ✖ Quenching treatment

4. ✖ Carburising treatment

Question Number : 122 Question Id : 41809919524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ledeburite consists of

Options :

1. ✖ Austenite and ferrite

2. ✖ Austenite and pearlite

3. ✖ Austenite and martensite

4. ✔ Austenite and cementite

Question Number : 123 Question Id : 41809919525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The stabilising agent for austenite phase is

Options :

1. ✔ Nickel

2. ✖ Chromium

3. ✖ Silicon

4. ✖ Molybdenum

Question Number : 124 Question Id : 41809919526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nucleating agents added to Al-alloys to promote heterogeneous nucleation is

Options :

1. ✖ Iron and Silicon

Titanium and Boron

2. ✔

Zirconium and Silicon

3. ✖

Chromium and nickel

4. ✖

Question Number : 125 Question Id : 41809919527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The element which will not shift the C-curve to the right is

Options :

Chromium

1. ✖

Cobalt

2. ✔

Manganese

3. ✖

Silicon

4. ✖

Question Number : 126 Question Id : 41809919528 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

Phase	Hardness (R_c)
(P) Soft Pearlite	(i) 40- 50
(Q) Fine Pearlite	(ii) 50-55
(R) Upper Bainite	(iii) 5
(S) Lower Bainite	(iv) 20-25

Options :

1. ✔ P- iii, Q-iv, R- i, S- ii

2. ✖ P- iii, Q-iv, R- ii, S- i

3. ✖ P- iv, Q-iii, R- i, S- ii

4. ✖ P- i, Q-ii, R- iii, S- iv

Question Number : 127 Question Id : 41809919529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The change in hardness is a function of both temperature and time of tempering of carbon steels is given by the relationship is

Options :

1. ✔ Hollomon - Jaffee parameter

2. ✖ Larson - Miller Parameter

3. ✖ Hall-Petch parameter

4. ✖ Mott- Nabarro's Parameter

Question Number : 128 Question Id : 41809919530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In continuous cooling transformation curve for eutectoid steel does not form

Options :

1. ✖ All pearlite structure

2. ✔ Bainite

3. ✖ Pearlite and martensite

4. ✖ All martensite structure

Question Number : 129 Question Id : 41809919531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The increasing order of stability of carbides in steel is

Options :

1. $Fe > Mn > Cr > W$ ✔

2. $Fe > Cr > Mn > W$ ✖

3. $Fe > W > Cr > Mn$ ✖

4. $Fe > Cr > W > Mn$ ✖

Question Number : 130 Question Id : 41809919532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a fully spheroidised steel, the spheroids consists of

Options :

1. Pearlite ✖

Cementite

2. ✔

Martensite

3. ✖

Ferrite

4. ✖

Question Number : 131 Question Id : 41809919533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The full annealing temperature for hypereutectoid steel is

Options :

Above Ac_1

1. ✔

Above Ac_3

2. ✖

Above Ac_m

3. ✖

Above Ac_2

4. ✖

Question Number : 132 Question Id : 41809919534 Display Question Number : Yes Is Question

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

Temper embrittlement in steels can be removed by adding

Options :

1. ✖ Mo and Al

2. ✖ W and Cu

3. ✖ Al and Cu

4. ✔ W and Mo

Question Number : 133 Question Id : 41809919535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Grossman's critical diameter of steel having hardness of Rc 54, then the microstructure at the center of the steel rod is

Options :

1. ✖ 100% Martensite

2. ✖ 100% Pearlite

3. ✔ 50% Pearlite and 50% Martensite

4. ✖ 50 % Austenite and 50% Pearlite

Question Number : 134 Question Id : 41809919536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order of severity of Quench (H) values for the quenching media from high to low is

Options :

1. ✖ Air, water, oil, brine

2. ✖ Brine, oil, water, air

3. ✖ Water, oil, brine, air

4. ✔ Brine, water, oil, air

Question Number : 135 Question Id : 41809919537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The standard specimen dimensions for Jominy End Quench test is

Options :

1. ✔ Length and diameter of rod is 4inch, 1 inch

2. ✖ Length and diameter of rod is 1inch, 1 inch

3. ✖ Length and diameter of rod is 1 inch, 4 inch

4. ✖ Length and diameter of rod is 1inch, 0.5 inch

Question Number : 136 Question Id : 41809919538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The liquid carburising batch consists of

Options :

1. ✔ NaCN, NaCl, $BaCl_2$

2. ✖ KCN, KCl, $BaCl_2$

3. ✖ NaCN, FeCl, $BaCl_2$

4. ✖

NaCN, NaCl, Fe_2O_3

Question Number : 137 Question Id : 41809919539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In nitriding of steel, a britlle phase is in the form of

Options :

1. ✖ Black layer

2. ✔ White layer

3. ✖ Blue layer

4. ✖ Yellow layer

Question Number : 138 Question Id : 41809919540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The percentage elongation corresponding to fracture point is called as

Options :

1. ✖ Reduction in area

Plastic instability

2. ✖

Uniform elongation

3. ✖

Total elongation

4. ✔

Question Number : 139 Question Id : 41809919541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The decreasing rate of work hardening is called

Options :

Dynamic recovery

1. ✔

Stress relieving

2. ✖

Grain growth

3. ✖

recrstallisation

4. ✖

Question Number : 140 Question Id : 41809919542 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

Crystal structure	Slip Plane
(P) HCP	(i) (1 1 0)
(Q) FCC	(ii) (0 0 0 1)
(R) BCC	(iii) (1 1 1)

Options :

1. ✖ P- i, Q-ii, R-iii

2. ✔ P- ii, Q-iii, R-i

3. ✖ P- ii, Q-i, R-iii

4. ✖ P- iii, Q-i, R-ii

Question Number : 141 Question Id : 41809919543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brittle fracture occur without any sign of

Options :

1. ✔ Plastic deformation

2. ✖ Creep

3. ✖ Strength

4. ✖ Recovery

Question Number : 142 Question Id : 41809919544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Griffith criteria is based on

Options :

1. ✖ No crack in brittle material

2. ✖ Pre-existing crack in ductile material

3. ✖ No crack in ductile material

4. ✔ Pre-existing crack in brittle material

Question Number : 143 Question Id : 41809919545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fatigue life of materials cannot be increased by

Options :

1. ✖ Shot peening

2. ✔ Decarburising

3. ✖ Nitriding

4. ✖ Fine grain size

Question Number : 144 Question Id : 41809919546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The tool used for making holes in the rammed sand moulds for escaping of gases is

Options :

1. ✖ Rammers

2. ✖ Gaggers

3. ✖ Trowels

4. ✔ Vent wire

Question Number : 145 Question Id : 41809919547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The pattern used to produce large numbers of small castings is

Options :

1. ✖ Single piece pattern

2. ✔ Match plate pattern

3. ✖ Sweep pattern

4. ✖ Skeleton pattern

Question Number : 146 Question Id : 41809919548 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

Additives	Properties
(P) Coal dust	(i) Self hardening
(Q) Dextrin	(ii) Bonding properties
(R) Molasses	(iii) Surface finish
(S) Sodium silicate	(iv) Bench life of sand

Options :

1. ✖ P-i, Q-ii, R-iii, S-iv

2. ✖ P-iii, Q-ii, R-i, S-iv

3. ✔ P-iii, Q-ii, R-iv, S-i

4. ✖ P-ii, Q-iii, R-iv, S-i

Question Number : 147 Question Id : 41809919549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore of magnesium is

Options :

1. ✖ Galena

Azurite

2. ✖

Carnalite

3. ✔

Cryolite

4. ✖

Question Number : 148 Question Id : 41809919550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mineral which is having magnetic in nature is

Options :

Chalcocite

1. ✖

Cuprite

2. ✖

Magnesite

3. ✖

Ilmenite

4. ✔

Question Number : 149 Question Id : 41809919551 Display Question Number : Yes Is Question

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

The function of depressor in froth flotation is

Options :

1. ✖ It acts like frother

2. ✖ It acts like a collector

3. ✖ It acts like an activator

4. ✔ It opposes the action of collector

Question Number : 150 Question Id : 41809919552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore particles are roasted while suspended in an upward stream of gas is

Options :

1. ✔ Fluidized bed roasting

2. ✖ Flash roasting

3. ✖ Hearth roasting

Blast roasting

4. ✖

Question Number : 151 Question Id : 41809919553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Slags used in smelting are classified according to their

Options :

Calcium degree

1. ✖

Silicate degree

2. ✔

Manganese degree

3. ✖

Sulphur degree

4. ✖

Question Number : 152 Question Id : 41809919554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Matte smelting is adopted in extraction of

Options :

Copper and nickel

1. ✔

Silver and gold

2. ✖

Zinc and lead

3. ✖

Iron and aluminium

4. ✖

Question Number : 153 Question Id : 41809919555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The metallic values in an ore are selectively dissolved by a suitable reagent known as

Options :

Roasting

1. ✖

Sintering

2. ✖

Leaching

3. ✔

Blending

4. ✖

Question Number : 154 Question Id : 41809919556 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 for treating low grade bauxite ore is

Options :

1. ✖ Lime sinter process

2. ✖ Serpeck process

3. ✖ Dow's process

4. ✔ Deville-Pechiney process

Question Number : 155 Question Id : 41809919557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process which combine liquation and oxidation and it is carried out in a reverberatory furnace is

Options :

1. ✖ Sintering

Roasting

2. ✖

Drossing

3. ✔

Smelting

4. ✖

Question Number : 156 Question Id : 41809919558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The supports for the core in the sand mould is

Options :

Chills

1. ✖

Follow board

2. ✖

Rammer

3. ✖

Chaplet

4. ✔

Question Number : 157 Question Id : 41809919559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Among the sands given below which contain highest clay content is

Options :

1. ✖ Green sand

2. ✔ Loam sand

3. ✖ Dry sand

4. ✖ Skin dried sand

Question Number : 158 Question Id : 41809919560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The gel formed in carbondioxide process in making mould is

Options :

1. ✔ Silica gel

2. ✖ Alumina gel

3. ✖ Calcium gel

Sodium gel

4. ✖

Question Number : 159 Question Id : 41809919561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cold chamber die casting is used to cast the materials like

Options :

Aluminium and magnesium

1. ✔

Lead and tin

2. ✖

Zinc and lead

3. ✖

Tin and zinc

4. ✖

Question Number : 160 Question Id : 41809919562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

To cast large size pipe by true centrifugal casting requires

Options :

1. ✖

Core is made of sand

Core is made of metal

2. ✖

No core

3. ✔

Core is made of plastic

4. ✖

Question Number : 161 Question Id : 41809919563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In full mould process pattern is made of

Options :

Plastic

1. ✖

Wood

2. ✖

Rubber

3. ✖

Polysterene

4. ✔

Question Number : 162 Question Id : 41809919564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The charge of cupola is

Options :

1. ✖ Scrap iron and coal

2. ✖ Wrought iron and coal

3. ✔ Pig iron and coke

4. ✖ Carbon steel and coke

Question Number : 163 Question Id : 41809919565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The defect occurs due to lack of fluidity in casting is

Options :

1. ✖ Scabs and washes

Misrun and cold shut

2. ✔

Drop and sand spots

3. ✖

Scar and buckles

4. ✖

Question Number : 164 Question Id : 41809919566 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 pressurised gating system in casting process

Options :

1. ✖ 1:2:2

1:3:3

2. ✖

1:1:3

3. ✖

1:2:1

4. ✔

Question Number : 165 Question Id : 41809919567 Display Question Number : Yes Is Question

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

The solidification time for a spherical casting of 1200mm in diameter having solidification factor of $0.87x10^6$ s/m^2 is

Options :

1. ✖ 380 minutes

2. ✖ 280 minutes

3. ✔ 580 minutes

4. ✖ 480 minutes

Question Number : 166 Question Id : 41809919568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Current employed in TIG welding of Al and Mg is

Options :

1. ✔ AC

2. ✖ DC

3. ✖ DCRP

4. ✖ DCSP

Question Number : 167 Question Id : 41809919569 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 resistance welding process?

Options :

1. ✖ Soldering

2. ✖ Submerged arc welding

3. ✔ Projection welding

4. ✖ Metal inert gas welding

Question Number : 168 Question Id : 41809919570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The joining or repairing of railway track is done by

Options :

1. ✖ Tungsten inert gas welding

2. ✖ Metal inert gas welding

3. ✖ Spot welding

4. ✔ Thermit welding

Question Number : 169 Question Id : 41809919571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The disadvantage of electron beam welding is

Options :

1. ✖ High welding speed

2. ✖ Distortion is less

3. ✖ High penetration

Size limitation of workpiece

4. ✔

Question Number : 170 Question Id : 41809919572 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 process can be classified as solid state welding?

Options :

Friction welding

1. ✔

GTAW

2. ✖

GMAW

3. ✖

PAW

4. ✖

Question Number : 171 Question Id : 41809919573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nonconsumable electrode is used in

Options :

Submerged arc welding

1. ✖

Metal inert gas welding

2. ✖

Tungsten inert gas welding

3. ✔

Shielded metal arc welding

4. ✖

Question Number : 172 Question Id : 41809919574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Degassing of steel is employed to remove

Options :

Dissolved carbon

1. ✖

Dissolved gases

2. ✔

Dissolved phosphorus

3. ✖

4. ✖

Dissolved sulphur

Question Number : 173 Question Id : 41809919575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

COREX process used for producing

Options :

1. ✔ Steel

2. ✖ Manganese

3. ✖ Iron

4. ✖ Aluminium

Question Number : 174 Question Id : 41809919576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A high cycle fatigue failure sample is identified by the presence of

Options :

1. ✖ Vacancy

Voids

2. ✖

Beach marking or striations

3. ✔

Kirkendall marking

4. ✖

Question Number : 175 Question Id : 41809919577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The blast of heat air is introduced in the blast furnace at

Options :

Tuyeres

1. ✔

Hearth

2. ✖

Stack

3. ✖

Charge

4. ✖

Question Number : 176 Question Id : 41809919578 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 for manufacturing wrought iron is

Options :

1. ✖ Cupola furnace

2. ✖ KALDO process

3. ✔ Pudding process

4. ✖ LD process

Question Number : 177 Question Id : 41809919579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Monel metal is an alloy of

Options :

1. ✖ Aluminium and Magnesium

2. ✔ Nickel and Copper

3. ✖

Magnesium and Nickel

Zinc and Copper

4. ✖

Question Number : 178 Question Id : 41809919580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Choose the incorrect statement

Options :

Plastics are light in weight

1. ✖

Plastics have high thermal conductivity

2. ✔

Plastics have good dimensional stability

3. ✖

Plastics are transparent and opaque

4. ✖

Question Number : 179 Question Id : 41809919581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the tetragonal crystal system

Options :

1. ✔ $a=b\neq c$ and $\alpha=\beta=\gamma=90^{o}$

2. ✖ $a=b=c$ and $\alpha\neq\beta\neq\gamma\neq90^{o}$

3. ✖ $a\neq b\neq c$ and $\alpha=\beta=\gamma=90^{o}$

4. ✖ $a\neq b\neq c$ and $\alpha\neq\beta\neq\gamma=90^{o}$

Question Number : 180 Question Id : 41809919582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The cathode in an x-ray tube is made of

Options :

1. ✖ Nickel filament

2. ✔ Tungsten filament

3. ✖ Chromium filament

Cadmium filament

4. ✖

Question Number : 181 Question Id : 41809919583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Micum index of coke is measure of

Options :

1. ✔ Strength and hardness

2. ✖ Moisture

3. ✖ Density

4. ✖ permeability

Question Number : 182 Question Id : 41809919584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The proximate analysis of coal determines the

Options :

Ash, fixed carbon, volatile matter and moisture

1. ✔

Sulphur and carbon content

2. ✖

Carbon and volatile matter

3. ✖

Ash and sulphur content

4. ✖

Question Number : 183 Question Id : 41809919585 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 blast furnace gas is

Options :

N_2 and CH_4

1. ✖

CO and CO_2

2. ✖

CH_4 and CO

3. ✖

N_2 and CO

4. ✔

Question Number : 184 Question Id : 41809919586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

High alumina refractories compared to fireclay bricks have

Options :

1. ✖ Low refractoriness

2. ✔ High resistance to thermal shock and creep

3. ✖ Low load bearing capacity

4. ✖ Low resistance to slag attack

Question Number : 185 Question Id : 41809919587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At the top of the bosh region in blast furnace a large mass of charge materials is stick to it is called as

Options :

1. ✔ Scaffolding

Draughting

2. ✖

Banking

3. ✖

pillaring

4. ✖

Question Number : 186 Question Id : 41809919588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following reaction takes place in blast furnace and it is called as

$Fe_2O_3 + 3C$ ---------> $3CO + 2Fe$

Options :

Solution loss reaction

1. ✖

Indirect reduction

2. ✖

Boudouard reaction

3. ✖

Direct reduction

4. ✔

Question Number : 187 Question Id : 41809919589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The life of refractory lining is less in case of

Options :

1. ✖ Bessemer converter

2. ✔ KALDO vessel

3. ✖ LD converter

4. ✖ Open hearth furnace

Question Number : 188 Question Id : 41809919590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fully deoxidised steel is called as

Options :

1. ✖ Capped steel

2. ✖ Rimmed steel

Semi killed steel

3. ✖

Killed steel

4. ✔

Question Number : 189 Question Id : 41809919591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The basic bessemer process of steel making is also known as

Options :

LD process

1. ✖

Thomas process

2. ✔

Open hearth process

3. ✖

Cupola furnace

4. ✖

Question Number : 190 Question Id : 41809919592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnetic particle inspection cannot detect the defects in

Options :

1. ✖ Precipitation hardened steels

2. ✔ Austenitic stainless steel

3. ✖ Cobalt alloys

4. ✖ Iron

Question Number : 191 Question Id : 41809919593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For detection of fatigue cracks during the service of materials is done by

Options :

1. ✖ Ultrasonic testing

2. ✖ Magnetic particle testing

3. ✔ Liquid penetrant testing

Eddy current testing

4. ✖

Question Number : 192 Question Id : 41809919594 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 the reactions are possible at all the temperatures.

Options :

$\Delta H>0$ and $\Delta S>0$

1. ✖

$\Delta H<0$ and $\Delta S<0$

2. ✖

$\Delta H=0$ and $\Delta S>0$

3. ✖

$\Delta H<0$ and $\Delta S>0$

4. ✔

Question Number : 193 Question Id : 41809919595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The entropy change for a phase transformation is

Options :

1.

ΔH- TΔS

2. ΔG-TΔH

3. Zero

4. ΔH/T ✔

Question Number : 194 Question Id : 41809919596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In endothermic reaction the value of ΔH is

Options :

1. Positive ✔

2. Constant

3. Zero

4. negative

Question Number : 195 Question Id : 41809919597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the intensity property from the following

Options :

1. ✖ Volume

2. ✖ Moles

3. ✔ Temperature

4. ✖ Enthalpy

Question Number : 196 Question Id : 41809919598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the extraction of ores, the Ellingham diagram helps to predict the feasibility of its

Options :

1. ✔ Thermal reduction

2. ✖

Electrolytic process

Zone refining process

3. ✖

Vapour phase extraction process

4. ✖

Question Number : 197 Question Id : 41809919599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The amount of heat required to raise the temperature of body by $1^{o}C$ or 1K

is

Options :

Heat

1. ✖

Latent heat

2. ✖

Specific heat

3. ✔

Heat capacity

4. ✖

Question Number : 198 Question Id : 41809919600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The roll mill that hot reduces a slab directly to strip in one pass is

Options :

1. ✖ Cluster mill

2. ✔ Planetary mill

3. ✖ Two- high roll mill

4. ✖ Four high roll mill

Question Number : 199 Question Id : 41809919601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Chevron type of defect occurs in

Options :

1. ✖ Forging

2. ✖ Casting

3.

Drawing rod and wires

Welding

4. ✖

Question Number : 200 Question Id : 41809919602 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 surface hardening treatment

Options :

Annealing

1. ✖

Normalising

2. ✖

Carburising

3. ✔

Stress relieving treatment

4. ✖