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 23rd Apr 2026 Shift 2
Subject Name :	Metallurgical Engineering
Creation Date :	2026-04-23 18:00:16
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Metallurgical Engineering

Group Number :	1
Group Id :	77951869
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	200

Mathematics

Section Id :	779518269
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory

Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	50
Section Negative Marks :	0
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	779518285
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 77951813609 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $3A+4B^T=\begin{bmatrix}7 & -10 & 17\\ 0 & 6 & 31\end{bmatrix}$ and $2B-3A^T=\begin{bmatrix}-1 & 18\\ 4 & -6\\ -5 & -7\end{bmatrix}$ then $B=$ _____

Options :

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

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

3. ✔ $\begin{bmatrix}1 & 3\\ -1 & 0\\ 2 & 4\end{bmatrix}$

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

Question Number : 2 Question Id : 77951813610 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If A and B are 4×4 matrices such that $A^2+B=A^2B$ then which of the following is correct?

Options :

1. ✖ $AB = I$

2. ✖ $A^2B = I$

3. ✔ $A^2B = BA^2$

4. ✖ $A^2 = I$ or $B = I$

Question Number : 3 Question Id : 77951813611 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If A is a matrix of order 3×3 and $\left|adj\left(adj\left(adjA\right)\right)\right| = 12^4$, then the value of $\left|A^{-1}adjA\right| =$ ____

Options :

1. ✖ 1

2. ✖ 12

3. ✔ $2\sqrt{3}$

4. ✖ $\sqrt{6}$

Question Number : 4 Question Id : 77951813612 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If A is a 4×4 matrix and $\left|2A\right| = 64$, $B = adjA$ then $\left|AdjB\right| =$ _____

Options :

1. ✔ 2^{18}

2. ✖ 2^{36}

3. ✖ 2^6

4. ✖ 2^9

Question Number : 5 Question Id : 77951813613 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

For what value of λ, the system of equations $x+2y+\lambda z=0,\ x+2y+z=6,\ x+2y+3z=10$, has no solution.____

Options :

1. ✖ 2

2. ✔ 3

3. ✖ 4

4. ✖ 5

Question Number : 6 Question Id : 77951813614 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\frac{42-19x}{(x^2+1)(x-4)}=\frac{Ax+B}{x^2+1}+\frac{C}{x-4}$ then $B=$_____

Options :

1. ✔ -11

2. ✖ 11

3. ✖ -2

4. ✖ 2

Question Number : 7 Question Id : 77951813615 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\frac{(x+1)^2}{x^3+x}=\frac{A}{x}+\frac{Bx+C}{x^2+1}$, then $\sin^{-1}\left(\frac{A}{C}\right)=$

Options :

1. ✔ $\frac{\pi}{6}$

2. ✖ $\frac{\pi}{4}$

3. ✖ $\frac{\pi}{3}$

4. ✖ $\frac{\pi}{2}$

Question Number : 8 Question Id : 77951813616 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\text{Sin}\theta+\text{Cos}\theta=\frac{1}{5}$ and $0\le\theta<\pi$ then $\tan\theta$ is _____

Options :

1. ✔ $\frac{-4}{3}$

2. ✖ $\frac{3}{4}$

3. ✖ $\frac{-3}{4}$

4. ✖ $\frac{4}{3}$

Question Number : 9 Question Id : 77951813617 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $f(x)=Sin^6 x+Cos^6 x$ then the range of $f(x)$ is _____

Options :

1. ✖ $\left(\frac{1}{4},\frac{3}{4}\right)$

2. ✖ $\left[\frac{1}{4},\frac{3}{4}\right]$

3. ✔ $\left[\frac{1}{4},1\right]$

4. ✖ $\left[\frac{3}{4},1\right]$

Question Number : 10 Question Id : 77951813618 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$Cos20^\circ+Cos80^\circ-\sqrt{3}Cos50^\circ=$ ____

Options :

1. ✖ -1

2. ✔ 0

3. ✖ 1

4. ✖ $\sqrt{3}$

Question Number : 11 Question Id : 77951813619 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

If $A = Sin45^\circ + Cos45^\circ$ and $B = Sin44^\circ + Cos44^\circ$ then which of the following is TRUE

Options :

1. ✔ $A > B$

2. ✖ $A < B$

3. ✖ $A = B$

4. ✖ $AB = 1$

Question Number : 12 Question Id : 77951813620 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If A, B, C are angles of a triangle such that $Cot\frac{A}{2} = 3Tan\frac{C}{2}$ then $Sin A,\ Sin B,\ Sin C$ are in___

Options :

1. ✔ Arithmetic Progression

2. ✖ Geometric Progression

3. ✖ Harmonic Progression

4. ✖ Arithmetic Geometric Progression

Question Number : 13 Question Id : 77951813621 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In ΔABC, if $Sin A = Sin^2 B$ and $2\,Cos^2 A = 3\,Cos^2 B$ then the triangle ABC is _____

Options :

1. ✖ equilateral

2. ✖ isosceles

3. ✔ obtuse angled

4. ✖ right angled

Question Number : 14 Question Id : 77951813622 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\text{Sec}\,855^\circ =$ _____

Options :

1. ✖ 1

2. ✖ $\sqrt{2}$

3. ✔ $-\sqrt{2}$

4. ✖ -1

Question Number : 15 Question Id : 77951813623 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The number of solutions of $\text{Sin}\,x = \frac{x}{10}$ is _____

Options :

1. ✖ 10

2. ✖ 3

3. ✖ 5

4. ✔ 7

Question Number : 16 Question Id : 77951813624 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is not the solution of the equation $Sin5x = 16Sin^5 x (n \in Z)$?

Options :

1. ✖ $n\pi + \frac{\pi}{6}$

2. ✖ $n\pi - \frac{\pi}{6}$

3. ✖ $n\pi$

4. ✔ $n\pi + \frac{\pi}{3}$

Question Number : 17 Question Id : 77951813625 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\frac{\pi}{2} \le \theta \le \frac{3\pi}{4}$ then $\cos^{-1}\left(\frac{5}{13}\sin\theta + \frac{12}{13}\cos\theta\right) =$ ____

Options :

1. ✖ $\theta - Tan^{-1}\left(\frac{4}{3}\right)$

2. ✖ $\theta + Tan^{-1}\left(\frac{5}{12}\right)$

3. ✖ $\theta + Tan^{-1}\left(\frac{4}{5}\right)$

4. ✔ $\theta - Tan^{-1}\left(\frac{5}{12}\right)$

Question Number : 18 Question Id : 77951813626 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If z is a complex number such that $|z|+z=3+i$, where $i=\sqrt{-1}$, then $|z|=$ ___

Options :

1. ✔ $\frac{5}{3}$

2. ✖ $\frac{5}{4}$

3. ✖ $\frac{\sqrt{34}}{3}$

4. ✖ $\frac{\sqrt{41}}{4}$

Question Number : 19 Question Id : 77951813627 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In the complex plane, if the points A and B represent $(1+i)$ and $(-1+i)$ then the angle between OA and OB is

Options :

1. ✖ $\frac{3\pi}{4}$

2. ✖ π

3. ✖ $\frac{\pi}{4}$

4. ✔ $\frac{\pi}{2}$

Question Number : 20 Question Id : 77951813628 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The largest distance from $(-3,2)$ to the circle $x^2+y^2-2x+2y+1=0$ _____

Options :

1. ✖ 8

2. ✖ 4

3. ✖ 18

4. ✔ 6

Question Number : 21 Question Id : 77951813629 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the line $3x-2y+6=0$ meets x-axis and y-axis respectively at A and B, then the equation of the circle with radius AB and centre at A is _____

Options :

1. ✖ $x^2+y^2+4x+9=0$

2. ✔ $x^2+y^2+4x-9=0$

3. ✖ $x^2+y^2+4x+4=0$

4. ✖ $x^2+y^2+4x-4=0$

Question Number : 22 Question Id : 77951813630 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The equation $16x^2+y^2+8xy-74x-78y+212=0$ represents _____

Options :

1. ✖ a circle

2. ✔ a parabola

3. ✖ an ellipse

4. ✖ hyperbola

Question Number : 23 Question Id : 77951813631 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The equation of major axis of the ellipse $\frac{(x-1)^2}{9}+\frac{(y-6)^2}{4}=1$ is

Options :

1. ✖ $y-2=0$

2. ✔ $y=6$

3. ✖ $x-1=0$

4. ✖ $x=9$

Question Number : 24 Question Id : 77951813632 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The equation $\frac{x^2}{7-k}+\frac{y^2}{5-k}=1$ represents a hyperbola if _____

Options :

1. ✔ $5<k<7$

2. ✖ $k>5$

3. ✖ $k < 5 \text{ or } k > 7$

4. ✖ $k \neq 5, k \neq 7$

Question Number : 25 Question Id : 77951813633 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The vertex of the parabola $y = ax^2 + bx + c$ is _____

Options :

1. ✖ $\left(\frac{b}{2a}, \frac{b^2 - 4ac}{4a}\right)$

2. ✖ $\left(\frac{b}{2a}, \frac{4ac - b^2}{4a}\right)$

3. ✖ $\left(\frac{-b}{2a}, \frac{b^2 - 4ac}{4a}\right)$

4. ✔ $\left(\frac{-b}{2a}, \frac{4ac - b^2}{4a}\right)$

Question Number : 26 Question Id : 77951813634 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\underset{x \to 0}{Lt}\left(\frac{|x|}{x} + x + 2\right) =$ _____

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

4. ✔ does not exist

Question Number : 27 Question Id : 77951813635 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to 0} \frac{e^{x^2}-\cos x}{\sin^2 x} = \_\_\_\_\_$$

Options :

1. ✖ 3

2. ✔ $\frac{3}{2}$

3. ✖ $\frac{5}{4}$

4. ✖ 2

Question Number : 28 Question Id : 77951813636 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following functions have finite number of points of discontinuity?

Options :

1. ✖ $\text{Tan}\, x$

2. ✖ $x[x]$

3. ✔ $\frac{|x|}{x}$

4. ✖ $Cotx$

Question Number : 29 Question Id : 77951813637 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ then $\frac{dy}{dx}$ at (a,b) is _____

Options :

1. ✖ $\frac{a}{b}$

2. ✖ $-\frac{a}{b}$

3. ✖ $\frac{b}{a}$

4. ✔ $-\frac{b}{a}$

Question Number : 30 Question Id : 77951813638 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The set of all points of differentiability of the function $f(x) = e^{-|x|}$ is

Options :

1. ✖ $(0,\infty)$

2. ✖ $[0,\infty)$

3. ✖ $(-\infty,\infty)$

4. ✔ $(-\infty,\infty)-\{0\}$

Question Number : 31 Question Id : 77951813639 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If there is an error of $\frac{3}{10}\%$ in the volume of a sphere then the percentage error in its radius is

Options :

1. ✔ $\frac{1}{10}$

2. ✖ $\frac{2}{10}$

3. ✖ $\frac{3}{10}$

4. ✖ 3

Question Number : 32 Question Id : 77951813640 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The value of p such that the line joining $(0,3),(5,-2)$ is a tangent to the curve $y=\frac{p}{x+1}$ is

Options :

1. ✖ 23

2. ✔ 4

3. ✖ 3

4. ✖ 1

Question Number : 33 Question Id : 77951813641 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The interval in which $f(x)=2x^2-\log x$ increases is _____

Options :

1. ✖ $\left(-\frac{1}{2},0\right)$

2. ✖ $\left(0,\frac{1}{2}\right)$

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

4. ✔ $\left(\frac{1}{2},\infty\right)$

Question Number : 34 Question Id : 77951813642 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The function $y=xe^x$ has _____

Options :

1. ✔ Minimum value at $x=-1$

2. ✖ Minimum value at $x=0$

3. ✖ Maximum value at $x=-1$

4. ✖ Maximum value at $x=0$

Question Number : 35 Question Id : 77951813643 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A particle is moving in a straight line such that its distance at any time t is given by

$s=\frac{t^4}{4}-2t^3+4t^2+7$ then its acceleration is minimum at t = _____

Options :

1. ✖ 1

2. ✔ 2

3. ✖ $\frac{1}{2}$

4. ✖ $\frac{3}{2}$

Question Number : 36 Question Id : 77951813644 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\int \frac{1}{(x+100)\sqrt{x+99}} dx = f(x) + c$ then $f(x) =$ _____

Options :

1. ✖ $2\sqrt{(x+100)}$

2. ✖ $3\sqrt{(x+100)}$

3. ✔ $2\,\mathrm{Tan}^{-1}\sqrt{x+99}$

4. ✖ $2\,\mathrm{Tan}^{-1}\sqrt{x+100}$

Question Number : 37 Question Id : 77951813645 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\int \frac{1+\cos 4x}{\cot x - \tan x} dx =$ _____

Options :

1. ✖ $\frac{1}{4}\cos 4x + c$

2. ✖ $\frac{1}{8}\cos 4x + c$

3. ✖ $-\frac{1}{4}\cos 4x + c$

4. ✔ $-\frac{1}{8}\cos 4x + c$

Question Number : 38 Question Id : 77951813646 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $I_n = \int \frac{t^n}{1+t^2} dt$ then $I_6 + I_4 =$ _____

Options :

1. ✖ $\frac{t^3}{3}$

2. ✖ $\frac{t^4}{4}$

3. ✔ $\frac{t^5}{5}$

4. ✖ $\frac{t^7}{7}$

Question Number : 39 Question Id : 77951813647 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\int (x+1)^2 e^x dx =$ _____

Options :

1. ✖ $xe^x + c$

2. ✖ x^2e^x+c

3. ✖ $(x+1)e^x+c$

4. ✔ $\left(x^2+1\right)e^x+c$

Question Number : 40 Question Id : 77951813648 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $\int \frac{2x^2+a^2}{x^2\left(x^2+a^2\right)}dx=\frac{k}{x}+\frac{1}{a}\tan^{-1}\frac{x}{a}+c$ then $k=$ _____

Options :

1. ✖ 0

2. ✔ -1

3. ✖ 1

4. ✖ $\frac{1}{a}$

Question Number : 41 Question Id : 77951813649 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If $k\int_0^1 xf(3x)dx=\int_0^3 tf(t)dt$ then $k=$ _____

Options :

1. ✔ 9

2. ✖ 3

3. ✖ $\frac{1}{9}$

4. ✖ $\frac{1}{3}$

Question Number : 42 Question Id : 77951813650 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\int_a^b \left(|x-a|+|x-b|\right)dx =$ _____, $(0<a<b)$

Options :

1. ✔ $(b-a)^2$

2. ✖ $(b-a)$

3. ✖ $(b+a)$

4. ✖ $(b+a)^2$

Question Number : 43 Question Id : 77951813651 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\int_0^2 \left[x^2\right]dx =$ _____

Options :

1. ✖ 0

2. ✔ $5-\sqrt{2}-\sqrt{3}$

3. ✖

$5+\sqrt{2}+\sqrt{3}$

4. ✖ $\sqrt{2}+\sqrt{3}+\sqrt{5}$

Question Number : 44 Question Id : 77951813652 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the order and degree of a differential equation $\left(\frac{d^4y}{dx^4}+\frac{d^2y}{dx^2}\right)^{\frac{5}{2}}=10\frac{d^2y}{dx^2}$ are p and q respectively, then $p+q=$

Options :

1. ✔ 9

2. ✖ 6

3. ✖ 7

4. ✖ 10

Question Number : 45 Question Id : 77951813653 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The differential equation of the family of concentric circles with Centre at the origin is

Options :

1. ✖ $x=y\frac{dy}{dx}$

2. ✖ $\frac{dy}{dx}=\frac{y}{x}$

3. ✔ $xdx+ydx=0$

4. ✖ $xdy+ydx=0$

Question Number : 46 Question Id : 77951813654 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

$\frac{dy}{dx} = xy + x + y + 1$ has the solution

Options :

1. ✖ $\log(y+1) = x^2 + x + c$

2. ✖ $\log(y+1) = x + c$

3. ✖ $\log(y+1) = -x + c$

4. ✔ $\log(y+1) = \frac{x^2}{2} + x + c$

Question Number : 47 Question Id : 77951813655 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The general solution of $\frac{ydx - xdy}{y^2} = 0$ represents a family of

Options :

1. ✔ Straight lines passing through the origin

2. ✖ Circles

3. ✖ parabolas

4. ✖ Hyperbolas

Question Number : 48 Question Id : 77951813656 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

Which of the following is an integrating factor for the differential equation

$$x\cos x\frac{dy}{dx}+(x\sin x+\cos x)y=1\ ?$$

Options :

1. ✖ $x\cos x$

2. ✖ $x\sin x$

3. ✔ $x\sec x$

4. ✖ $x\cos ecx$

Question Number : 49 Question Id : 77951813657 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The equation of the curve passing through the origin and satisfying the differential equation

$$\frac{dy}{dx}=(x-y)^2 \text{ is } \_\_\_\_$$

Options :

1. ✔ $e^{2x}(1-x+y)=1+x-y$

2. ✖ $e^{2x}(1+x-y)=1-x+y$

3. ✖ $e^{2x}(1+x+y)=1-x+y$

4. ✖ $e^{2x}(1-x+y)=-(1+x+y)$

Question Number : 50 Question Id : 77951813658 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the solution $y(x)$ of the given differential equation $\left(e^{y}+1\right)\cos x dx+e^{y}\sin x dy=0$ passes through the point $\left(\frac{\pi}{2},0\right)$, then the value of $e^{y\left(\frac{\pi}{6}\right)}$ is

Options :

1. ✖ 2

2. ✔ 3

3. ✖ e^{2}

4. ✖ e^{-3}

Physics

Section Id :	779518270
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Section Negative Marks :	0
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	779518286
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 77951813659 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If F is the force, S is the displacement and V is the velocity of the particle, the dimensions of the ratio FS/V^2 will be

Options :

1. ✖

M^0LT^0

2. ✔ $M^1L^0T^0$

3. ✖ M^0L^0T

4. ✖ $M^0L^0T^0$

Question Number : 52 Question Id : 77951813660 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Among the following, unit less quantity is

Options :

1. ✖ Velocity gradient

2. ✖ Pressure gradient

3. ✔ Displacement gradient

4. ✖ Force gradient

Question Number : 53 Question Id : 77951813661 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the component of one vector in the direction of another vector is zero, then those two vectors are

Options :

1. ✖ parallel to each other

2. ✔ perpendicular to each other

3. ✖ opposite to each other

4. ✖ coplanar vectors

Question Number : 54 Question Id : 77951813662 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the resultant of two vectors is equal to either of vectors, the angle between them is

Options :

1. ✖ 30^0

2. ✖ 60^0

3. ✖ 90^0

4. ✔ 120^0

Question Number : 55 Question Id : 77951813663 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The angle made by the vector $(2\hat{\imath}+2\hat{\jmath})$ with X-axis is

Options :

1. ✔ 45^0

2. ✖ 60^0

3. ✖ 90^0

4. ✖ 120^0

Question Number : 56 Question Id : 77951813664 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The length of a vector $(3\hat{\imath}+\hat{\jmath}+2\hat{k})$ in XY plane is

Options :

1. ✖ $\sqrt{14}$

2. ✖ 2

3. ✔ $\sqrt{10}$

4. ✖ $\sqrt{5}$

Question Number : 57 Question Id : 77951813665 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A stone projected up with a velocity 'u' reaches two points A and B at a distance 'h' with velocities u/2 and u/3. The maximum height reached by the stone is

Options :

1. ✖ $\frac{9h}{5}$

2. ✖ $\frac{27h}{4}$

3. ✖ $\frac{36h}{27}$

4. ✔

$\frac{36h}{5}$

Question Number : 58 Question Id : 77951813666 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A ball is thrown at a speed of 20 m s^{-1} at an angle of 30^0 with the horizontal. The maximum height reached by the ball is (g = 10 ms^{-2})

Options :

1. ✖ 2 m

2. ✖ 3 m

3. ✖ 4 m

4. ✔ 5 m

Question Number : 59 Question Id : 77951813667 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A body of mass 2 kg is moving with a constant acceleration of $(2\hat{i}+3\hat{j}-\hat{k})$ ms^{-2}. If the displacement made by the body is $(3\hat{i}-\hat{j}+2\hat{k})$ m then the work done is

Options :

1. ✔ 2 J

2. ✖ 10 J

3. ✖ 12 J

4. ✖ 22 J

Question Number : 60 Question Id : 77951813668 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The average power generated by a 90 kg mountain climber who climbs a summit of height 600 m in 90 minutes is ($g = 10\ ms^{-2}$)

Options :

1. 100 W ✔

2. 25 W ✖

3. 200 W ✖

4. 50 W ✖

Question Number : 61 Question Id : 77951813669 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A body of mass 16 kg explodes into two pieces of masses 4 kg and 12 kg. The velocity of the 12 kg mass is 4 ms^{-1}. The kinetic energy of the second piece is

Options :

1. 96 J ✖

2. 144 J ✖

3. 192 J ✖

4. 288 J ✔

Question Number : 62 Question Id : 77951813670 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Two bodies of masses of 1 g and 4 g are moving with equal kinetic energies. The ratio of the magnitudes of their linear momenta is

Options :

1. ✖ $4 : 1$

2. ✖ $\sqrt{2} : 1$

3. ✔ $1 : 2$

4. ✖ $1 : 16$

Question Number : 63 Question Id : 77951813671 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A sound absorber attenuates the sound level by 20 dB. The intensity decreases by a factor of

Options :

1. ✖ 10

2. ✔ 100

3. ✖ 1000

4. ✖ 10000

Question Number : 64 Question Id : 77951813672 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A source of sound is moving towards a wall with a speed of 20 ms^{-1}. The frequency of the sound produced by the source is 400 Hz. If the speed of the sound is 340 ms^{-1}, the beat frequency heard by a person standing near the wall is

Options :

1. ✔ 0 Hz

2. ✖ 2Hz

3. ✖ 5 Hz

4. ✖ 10 Hz

Question Number : 65 Question Id : 77951813673 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A person standing between two parallel hills fires a gun. He hears the first echo after 1.5 sec and second echo after 2.5 sec. If the speed of a sound is 332 ms^{-1}, the distance between the hills is

Options :

1. ✖ 654 m

2. ✔ 664 m

3. ✖ 674 m

4. ✖ 684 m

Question Number : 66 Question Id : 77951813674 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The velocity of sound in air is 330 ms^{-1}. To increase the apparent frequency of the sound by 50 %, the source should move towards the stationary observer with a velocity equal to

Options :

1. ✖ 330 ms^{-1}

2. ✖ 220 ms^{-1}

3. ✖ 165 ms^{-1}

4. ✔ 110 ms^{-1}

Question Number : 67 Question Id : 77951813675 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the total absorption of a hall is doubled, the reverberation time will

Options :

1. ✖ Double

2. ✔ Become half

3. ✖ Remain same

4. ✖ Become four times

Question Number : 68 Question Id : 77951813676 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The volume V of an enclosure contains a mixture of gases like 16 g of oxygen, 28 g of nitrogen and 44 g of carbon dioxide at absolute temperature T. The pressure of the mixture of gases is (R is universal gas constant)

Options :

1. ✖ 3RT/V

2. ✖ 4RT/V

3. ✔ 5RT/2V

4. ✖ 88RT/V

Question Number : 69 Question Id : 77951813677 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Certain quantity of heat is supplied to a monoatomic ideal gas which expands at constant pressure. The percentage of heat that goes into work done by the gas is

Options :

1. ✖ 20%

2. ✔ 40%

3. ✖ 60%

4. ✖ 80%

Question Number : 70 Question Id : 77951813678 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The wrong statement among the following is

Options :

1. ✖ During free expansion, temperature of ideal gas does not change

2. ✖ During free expansion, temperature of real gas decreases

3. ✔ During free expansion of real gas temperature does not change

4. ✖ Free expansion is conducted in adiabatic manner

Question Number : 71 Question Id : 77951813679 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A monoatomic ideal gas, initially at temperature T_1 is enclosed in a cylinder fitted with a frictionless piston. The gas is allowed to expand adiabatically to a temperature T_2 by releasing the piston suddenly. If L_1 and L_2 are the lengths of the gas column, before and after the expansion, then the value of T_1/ T_2 will be

Options :

1. ✖ $(L_1/ L_2)^{2/3}$

2. ✔ $(L_2/ L_1)^{2/3}$

3. ✖ L_2/ L_1

4. ✖ L_1/ L_2

Question Number : 72 Question Id : 77951813680 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A gas behaves more closely as an ideal gas at

Options :

1. ✖ Low pressure and low temperature

2. ✔ Low pressure and high temperature

3. ✖ High pressure and low temperature

4. ✖ High pressure and high temperature

Question Number : 73 Question Id : 77951813681 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

If the maximum kinetic energy of emitted photo electrons from a metal is 0.9 eV and work function is 2.2 eV then the energy and wavelength of incident radiation are

Options :

1. ✔ 3.1 eV, 4000 A^0

2. ✖ 2.2 eV, 2000 A^0

3. ✖ 2.2 eV, 4000 A^0

4. ✖ 3.1 eV, 2000 A^0

Question Number : 74 Question Id : 77951813682 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The core of an optical fibre is surrounded by

Options :

1. ✔ Cladding

2. ✖ Plastic jacket

3. ✖ Air

4. ✖ Metal sheath

Question Number : 75 Question Id : 77951813683 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The favourable condition for superconducting state of a matter is

Options :

1. ✖ A weak electron-phonon interaction

2. ✔ A strong electron-phonon interaction

3. ✖ A strong phonon -phonon interaction

4. ✖ A weak phonon -phonon interaction

Chemistry

Section Id :	779518271
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25

Section Negative Marks :	0
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	779518287
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 77951813684 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In which of the following, the number of unpaired electrons is maximum?

Options :

1. ✖ P^{3-} (Z=15)

2. ✔ S (Z=16)

3. ✖ Cl (Z=17)

4. ✖ Al^{3+} (Z=13)

Question Number : 77 Question Id : 77951813685 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The n, l values possible for a sublevel with seven degenerate orbitals are respectively (where n, l represent the symbols of principal and Azimuthal quantum numbers respectively)

Options :

1. ✔ 4, 3

2. ✖ 3, 4

3. ✖ 5, 1

4. ✖ 6, 2

Question Number : 78 Question Id : 77951813686 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The number of electrons with magnetic quantum number, $m_l = 0$ in chloride ion is (Cl (Z=17))

Options :

1. ✖ 6

2. ✖ 8

3. ✔ 10

4. ✖ 18

Question Number : 79 Question Id : 77951813687 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Atomic numbers of four elements A, B, C and D are (Z-1), (Z+2), Z and (Z+1), respectively. If Z=9, the type of bonding between A and B is (where Z= Atomic number of element)

Options :

1. ✖ Dative bond

2. ✖ Polar Covalent bond

3. ✔ Electrovalent bond

4. ✖ Non polar Covalent bond

Question Number : 80 Question Id : 77951813688 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Identify the molecule in which central atom is not obeying the octet rule.

Options :

1. ✖ H_2O

2. ✖ PCl_3

3. ✔ BF_3

4. ✖ NH_3

Question Number : 81 Question Id : 77951813689 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The mass of Na_2CO_3 (in g) (M.wt=106) present in 1.0 L of 0.05 M solution is

Options :

1. ✖ 0.53

2. ✖ 53.0

3. ✖ 26.5

4. ✔ 5.30

Question Number : 82 Question Id : 77951813690 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A gaseous mixture contains 14 g of N_2, 8.0 g of O_2 and 8.0 g of H_2. Total number of molecules present in the mixture is (N_A= Avogadro number)
(At.wt; H=1, N=14, O=16)

Options :

1. ✖ 2.75 N_A

2. ✖

3.75 N_A

3. ✔ 4.75 N_A

4. ✖ 1.50 N_A

Question Number : 83 Question Id : 77951813691 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The ratio of equivalent weights of HNO_3 and H_2SO_4 is

Options :

1. ✖ 9:5

2. ✖ 6:5

3. ✖ 7:9

4. ✔ 9:7

Question Number : 84 Question Id : 77951813692 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following cannot act as a buffer?

Options :

1. ✖ $NH_4OH + NH_4Cl$

2. ✖ $CH_3COOH + CH_3COONa$

3. ✖ $H_2CO_3 + Na_2CO_3$

4. ✔ $HCl + NaCl$

Question Number : 85 Question Id : 77951813693 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

200 mL of 0.1 M NaOH is allowed to react completely with 100 mL of 0.1 M HCl and the solution is diluted to 1.0 L by adding water. The pH of the mixture is

Options :

1. ✖ 3

2. ✖ 11

3. ✖ 2

4. ✔ 12

Question Number : 86 Question Id : 77951813694 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is an example of non-electrolyte?

Options :

1. ✖ CH_3COONa

2. ✖ NaCl

3. ✖ NaOH

4. ✔ C_2H_5OH

Question Number : 87 Question Id : 77951813695 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In a galvanic cell, electrons flow from

Options :

1. ✖ anode to cathode through the solution

2. ✖ cathode to anode through the solution

3. ✔ anode to cathode through the external circuit

4. ✖ cathode to anode through the external circuit

Question Number : 88 Question Id : 77951813696 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Saturated solution of KNO_3 is used to make salt bridge because

Options :

1. ✖ Velocity of K^+ is greater than NO_3^-

2. ✖ Velocity of NO_3^- is greater than K^+

3. ✔ Velocity of K^+ approximately equal to NO_3^-

4. ✖ KNO_3 is highly soluble in water

Question Number : 89 Question Id : 77951813697 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A 2 kg water sample contains 408 mg of $CaSO_4$ (M.wt =136). The hardness in terms of $CaCO_3$ equivalents (in ppm) is

Options :

1. ✖ 100

2. ✖ 136

3. ✔ 150

4. ✖ 204

Question Number : 90 Question Id : 77951813698 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of following is responsible for temporary hardness of water?

Options :

1. ✖ $NaHCO_3$

2. ✔ $Ca\ (HCO_3)_2$

3. ✖ $NaHSO_4$

4. ✖ $CaCl_2$

Question Number : 91 Question Id : 77951813699 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Demineralised water can be obtained by using

Options :

1. ✖ Clark's method

2. ✖ Permutit method

3. ✖ Calgon's method

4. ✔ Ion exchange resin method

Question Number : 92 Question Id : 77951813700 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is considered as high corrosive resistant material?

Options :

1. ✖ Cast iron

2. ✔ Stainless steel

3. ✖ Zinc

4. ✖ Mild steel

Question Number : 93 Question Id : 77951813701 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The wrong statement about corrosion is

Options :

1. ✖ Corrosion involves oxidation

2. ✖ Hydrated ferric oxide is called rust

3. ✔ Lesser the potential difference between the two metals, greater will be the corrosion of anodic metal

4. ✖ Coating of zinc on iron is an example of anodic coating

Question Number : 94 Question Id : 77951813702 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

An example for condensation polymer is

Options :

1. ✖ Neoprene rubber

2. ✖ Natural rubber

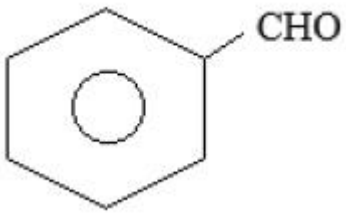
3. ✔ Urea - formaldehyde resin

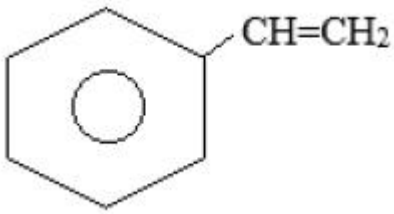
4. ✖ Polytetrafluoroethylene

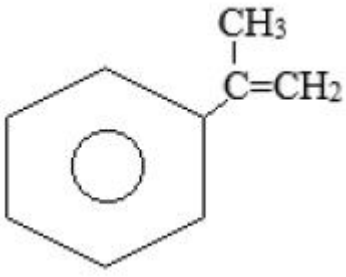
Question Number : 95 Question Id : 77951813703 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

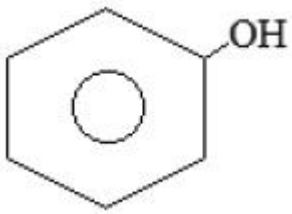
Buna-S is a polymer of monomers X and Y. If X is $CH_2 = CH - CH = CH_2$, then what is Y?

Options :

1. ✖ 

2. ✔ 

3. ✖ 

4. ✖ 

Question Number : 96 Question Id : 77951813704 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is an elastomer?

Options :

1. ✔ Neoprene

2. ✖ Polyvinyl chloride

3. ✖ Bakelite

4. ✖ Teflon

Question Number : 97 Question Id : 77951813705 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The monomer of Teflon is

Options :

1. ✖ $F_2C = CF(Cl)$

2. ✖ $F_2C = CCl_2$

3. ✖ $F_2C = C\ (Br)Cl$

4. ✔

$F_2C = CF_2$

Question Number : 98 Question Id : 77951813706 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The major component of biogas is

Options :

1. ✔ CH_4

2. ✖ CO

3. ✖ N_2

4. ✖ NH_3

Question Number : 99 Question Id : 77951813707 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Ageing of skin, cataract and skin cancer are the result of

Options :

1. ✖ Acid rain

2. ✖ Green-house effect

3. ✔ Depletion of O_3 layer

4. ✖ CO Pollution

Question Number : 100 Question Id : 77951813708 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is not a green-house effect gas?

Options :

1. ✖ N_2O

2. ✖ CH_4

3. ✖ CO_2

4. ✔ N_2

Metallurgical Engineering

Section Id :	779518272
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Section Negative Marks :	0
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	779518288
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 77951813709 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The energy necessary for the reduction of the particles size is directly proportional to the increase of the surface of the particle. This law is called

Options :

1. ✖ Stoke's law

2. ✖ Taggart's Law

3. ✔ Rittinger's Law

4. ✖ Newton's Law

Question Number : 102 Question Id : 77951813710 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Separation of particles of various sizes, shapes and densities by allowing them to settle in a fluid is called

Options :

1. ✖ Froth Floatation

2. ✔ Classification

3. ✖ Thickening

4. ✖ Dewatering

Question Number : 103 Question Id : 77951813711 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The Ores crushed in gyratory crusher by action of

Options :

1. ✖ Impact

2. ✖ Attrition

3. ✔ Compression

4. ✖ Cutting

Question Number : 104 Question Id : 77951813712 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Froth Floatation method is mostly used for concentration of

Options :

1. ✖ Carbonate Ores

2. ✔ Sulphide Ores

3. ✖ Magnetic Ores

4. ✖ Oxide Ores

Question Number : 105 Question Id : 77951813713 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the processes is not part of pyrometallurgy?

Options :

1. ✖ Calcination of lime stone

2. ✖ Roasting of sulfide ores

3. ✖ Smelting of iron ore

4. ✔ Leaching of copper ore with H_2SO_4

Question Number : 106 Question Id : 77951813714 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which is the cheapest method of metal extractions?

Options :

1. ✖ Pyrometallurgical

2. ✔ Hydrometallurgical

3. ✖ Electrometallurgical

4. ✖ All are equally cheap

Question Number : 107 Question Id : 77951813715 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The determination of carbon, hydrogen, Sulphur, Oxygen and nitrogen content in coal is done by

Options :

1. ✖ Proximate Analysis

2. ✔ Ultimate Analysis

3. ✖ Solidification

4. ✖ Gasification

Question Number : 108 Question Id : 77951813716 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which is Acid Refractory?

Options :

1. ✖ Magnesite

2. ✖ Chromite

3. ✖ Dolomite

4. ✔ Silica

Question Number : 109 Question Id : 77951813717 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Metallurgical coke should have a desired property of

Options :

1. ✖ High volatile matter

2. ✖ Low fixed carbon

3. ✔ High ash fusion temperature

4. ✖ Low Brittleness

Question Number : 110 Question Id : 77951813718 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The cooling medium used in dry quenching of coke is

Options :

1. ✔ Nitrogen

2. ✖ Air

3. ✖ Carbon monoxide

4. ✖ Phenolic water

Question Number : 111 Question Id : 77951813719 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

L.P.G Stands for

Options :

1. ✖

Liquid Petrol Gas

2. ✔ Liquefied Petroleum Gas

3. ✖ Lower Percentage Gas

4. ✖ Liquid Petrol Gallon

Question Number : 112 Question Id : 77951813720 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The Carnot's Cycle consists of

Options :

1. ✖ One isothermal and one adiabatic step

2. ✔ Two isothermal and two adiabatic steps

3. ✖ One isothermal and three adiabatic steps

4. ✖ Three isothermal and one adiabatic step

Question Number : 113 Question Id : 77951813721 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is an extensive property?

Options :

1. ✔ Enthalpy

2. ✖ Density

3. ✖ Viscosity

4. ✖ Concentration

Question Number : 114 Question Id : 77951813722 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The diagram which is plotted between standard free energy changes of various metal oxides as a function of temperature is

Options :

1. ✖ pH diagram

2. ✖ Pourbaix diagram

3. ✖ Predominance area diagram

4. ✔ Ellingham diagram

Question Number : 115 Question Id : 77951813723 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

An ideal solution is one, which obeys

Options :

1. ✔ Raoult's law

2. ✖ Henry's law

3. ✖ Sivert's law

4. ✖ Gibb's law

Question Number : 116 Question Id : 77951813724 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

A system is defined as a part of universe .....

Options :

1. ✔ Selected for consideration

2. ✖ Consisting of solid phase

3. ✖ Consisting of gas phase

4. ✖ Consisting of liquid phase

Question Number : 117 Question Id : 77951813725 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Free energy change for vaporization of pure substance is

Options :

1. ✖ Unity

2. ✖ Positive

3. ✔ Zero at boiling point

4. ✖ Negative

Question Number : 118 Question Id : 77951813726 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The First law of thermodynamics is mathematically stated as .....

Options :

1. ✖ $dQ = dE - dW$

2. ✖ $dE = dW + dQ$

3. ✖ $dH = dW + dQ$

4. ✔ $dQ = dE + dW$

Question Number : 119 Question Id : 77951813727 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Isobaric process means a constant ..... process

Options :

1. ✖ Temperature

2. ✔ Pressure

3. ✖ Volume

4. ✖ Entropy

Question Number : 120 Question Id : 77951813728 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The term Pearlite in Fe-C diagram refers to

Options :

1. ✖ Martensite + Austenite

2. ✖ Ferrite + Austenite

3. ✔ Ferrite + Cementite

4. ✖ Austenite + Cementite

Question Number : 121 Question Id : 77951813729 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is used for prediction of chemical composition of phases in phase diagram?

Options :

1. ✔ Tie Line

2. ✖ Solvus line

3. ✖ Lever rule

4. ✖ Freezing range line

Question Number : 122 Question Id : 77951813730 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Driving force for grain growth after completion of recrystallisation is

Options :

1. ✔ Grain boundary energy

2. ✖ Dislocation density

3. ✖ Vacancy concentration

4. ✖ Stored energy

Question Number : 123 Question Id : 77951813731 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is an amorphous material?

Options :

1. ✖

Brass

2. ✔ Glass

3. ✖ Aluminium

4. ✖ Gold

Question Number : 124 Question Id : 77951813732 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The atomic radius of atom in FCC structure having a lattice parameter 'a' is

Options :

1. ✖ $a\sqrt{2}/2$

2. ✔ $a/2\sqrt{2}$

3. ✖ $a\sqrt{3}/4$

4. ✖ $a/2$

Question Number : 125 Question Id : 77951813733 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Stacking sequence of FCC is

Options :

1. ✖ ……ABABABABA……

2. ✖ ……ACBCCBACC……

3. ✔ ……ABCABCABC……

4. ✖ .....CBACBACBB.....

Question Number : 126 Question Id : 77951813734 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Isomorphous binary phase diagram is formed between two components which exhibit

Options :

1. ✖ Complete liquid solubility but partial solid solubility

2. ✖ Complete solid solubility but partial liquid solubility

3. ✖ Partial liquid solubility as well as partial solid solubility

4. ✔ Complete liquid solubility as well as complete solid solubility

Question Number : 127 Question Id : 77951813735 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In a metallurgical microscope the power of the objective is '40X' and that of eye piece is '10X' then the overall magnification of the microscope is

Options :

1. ✖ 50X

2. ✖ 40X

3. ✖ 4X

4. ✔ 400X

Question Number : 128 Question Id : 77951813736 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In Iron-Carbon equilibrium diagram, the Eutectic point is at

Options :

1. ✔ 4.3% C and 1147° C

2. ✖ 4.3% C and 727° C

3. ✖ 0.8% C and 727° C

4. ✖ 0.8% C and 1495° C

Question Number : 129 Question Id : 77951813737 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Self-diffusion in FCC metals occurs mainly by one of the following mechanisms

Options :

1. ✖ Interstitial

2. ✖ Substitutional

3. ✖ Inter-Substitutional

4. ✔ Vacancy

Question Number : 130 Question Id : 77951813738 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

State the number of grains per square inch at a magnification of 100X, for ASTM grain size number 8

Options :

1. ✖ 64

2. ✔ 128

3. ✖ 256

4. ✖ 512

Question Number : 131 Question Id : 77951813739 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Prolonged Annealing of steel results in

Options :

1. ✖ Decrease in ductility

2. ✖ Increase in Strength

3. ✖ High Hardness

4. ✔ Grain Growth

Question Number : 132 Question Id : 77951813740 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Case carburizing is the most widely used technique for case hardening of steel parts with

Options :

1. ✔ Low carbon content

2. ✖ High carbon content

3. ✖ High Hardness

4. ✖ High electrical resistance

Question Number : 133 Question Id : 77951813741 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which coolant of the following is used in laser surface hardening?

Options :

1. ✖ Water medium

2. ✖ Oil medium

3. ✔ No medium

4. ✖ Lubricant medium

Question Number : 134 Question Id : 77951813742 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Tempering of quenched steel is primarily done to

Options :

1. ✖ Increase hardness and brittleness

2. ✔ Reduce brittleness and increase toughness

3. ✖ Melt the steel partially

4. ✖ Remove carbon from the surface

Question Number : 135 Question Id : 77951813743 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Sub-Zero treatment of steel is carried out for

Options :

1. ✖ Converting Austenite to Bainite

2. ✖ Converting retained Austenite to pearlite

3. ✖ Converting retained Austenite to Ferrite

4. ✔ Converting retained Austenite to Martensite

Question Number : 136 Question Id : 77951813744 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

..... Is the Thermo-Mechanical treatment of steel

Options :

1. ✖ Martempering

2. ✖ Austempering

3. ✔ Ausforming

4. ✖ Annealing

Question Number : 137 Question Id : 77951813745 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Heat treatment of metal is necessary

Options :

1. ✔ To produce certain desired properties

2. ✖ To make good appearance on the component

3. ✖ To improve only strength of material

4. ✖ To make the metal rust proof

Question Number : 138 Question Id : 77951813746 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In the furnace with heating element temperature at 1700°C, the dominant mechanism of heat transfer will be

Options :

1. ✖ Conduction

2. ✔ Radiation

3. ✖ Natural convection

4. ✖ Forced convection

Question Number : 139 Question Id : 77951813747 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Austempering of steel leads to formation of

Options :

1. ✖ Pearlite

2. ✖ Martensite

3. ✔ Bainite

4. ✖ Austenite

Question Number : 140 Question Id : 77951813748 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Quenching medium with the highest severity effect

Options :

1. ✔ Brine

2. ✖ Soluble oil

3. ✖ Liquid salts

4. ✖ Air

Question Number : 141 Question Id : 77951813749 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which heat treatment is suitable for Al-Cu Alloys

Options :

1. ✖ Martempering

2. ✖ Austempering

3. ✖ Hardening

4. ✔ Age Hardening

Question Number : 142 Question Id : 77951813750 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Alloying element that does not shifts TTT curve towards right side is

Options :

1. ✖ Nickle

2. ✖ Chromium

3. ✖ Molybdenum

4. ✔ Carbon

Question Number : 143 Question Id : 77951813751 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Diameter of blast furnace is maximum at

Options :

1. ✖ Hearth

2. ✖ Stack

3. ✔ Bosh

4. ✖ Throat

Question Number : 144 Question Id : 77951813752 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Conditions for Dephosphorisation of Molten Iron is

Options :

1. ✖ Oxidising and neutral slag

2. ✔ Oxidising and Basic Slag

3. ✖ Reducing and neutral slag

4. ✖ Reducing and Acidic Slag

Question Number : 145 Question Id : 77951813753 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The product of a commercial direct reduction process is

Options :

1. ✔ Sponge iron

2. ✖ Pig iron

3. ✖ Liquid steel

4. ✖ Hot steel

Question Number : 146 Question Id : 77951813754 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following factors helps in minimizing scaffold formation inside a blast furnace?

Options :

1. ✖ High alkali content in the burden

2. ✔ Adequate blast pressure and high temperature

3. ✖ Low slag basicity

4. ✖ Oversized coke only

Question Number : 147 Question Id : 77951813755 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Blast furnace stoves are used for preheating of ……

Options :

1. ✖ Refractories

2. ✖ Iron ore

3. ✔ Air/blast

4. ✖ Lime

Question Number : 148 Question Id : 77951813756 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The main application of ferro-chrome (Fe-Cr) is as a

Options :

1. ✖ Deoxidiser

2. ✖ Degassifier

3. ✖ Raw material for carbon refractory manufacturing

4. ✔ Raw material for stainless steel production

Question Number : 149 Question Id : 77951813757 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

First impurity to get removed in LD steel making is

Options :

1. ✖ Phosphorus

2. ✖ Carbon

3. ✔ Silicon

4. ✖ Manganese

Question Number : 150 Question Id : 77951813758 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Permeability of the charge in the bosh region of the blast furnace is maintained by

Options :

1. ✖ Sinter

2. ✔ Coke

3. ✖ Iron ore

4. ✖ Limestone flux

Question Number : 151 Question Id : 77951813759 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The process of pouring molten steel into ingot moulds is called

Options :

1. ✔ Teeming

2. ✖ Tapping

3. ✖ Charging

4. ✖ Unloading

Question Number : 152 Question Id : 77951813760 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following normally employ's regenerator?

Options :

1. ✖ LD converter

2. ✔ Open hearth furnace

3. ✖ Electric Induction furnace

4. ✖ Electrical arc furnace

Question Number : 153 Question Id : 77951813761 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The main function of the RH process of steel treatment is to

Options :

1. ✖ Remove carbon from molten steel

2. ✖ Increase the carbon content of steel

3. ✖ Preheat the molten steel before casting

4. ✔ Remove dissolved gases such as H_2, N_2, SO_2

Question Number : 154 Question Id : 77951813762 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In continuous casting process, the mould is generally made of

Options :

1. ✖ Cast Iron

2. ✖ Bronze

3. ✔ Copper

4. ✖ Tungsten carbide

Question Number : 155 Question Id : 77951813763 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Bayer's process is used for purifying

Options :

1. ✔ Bauxite

2. ✖ Alumina

3. ✖ Aluminium

4. ✖ Copper

Question Number : 156 Question Id : 77951813764 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The most common ore of the lead is

Options :

1. ✖ Anglesite

2. ✖ Cerussite

3. ✖ Rutile

4. ✔ Galena

Question Number : 157 Question Id : 77951813765 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Copper matte comprises mainly of

Options :

1. ✖ Copper sulphide and Iron oxide

2. ✔ Copper sulphide and Iron sulphide

3. ✖ Copper sulphide and Iron sulphate

4. ✖ Copper sulphide and copper oxide

Question Number : 158 Question Id : 77951813766 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Electrolytic reduction of alumina is done by the ..... Process

Options :

1. ✖ Hoope's

2. ✔ Hall and Heroult

3. ✖ Bayer's

4. ✖ Harris

Question Number : 159 Question Id : 77951813767 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The removal of impurities from lead metal is done through

Options :

1. ✔ Parkes process

2. ✖ Poling process

3. ✖ Zone refining

4. ✖

amalgamation

Question Number : 160 Question Id : 77951813768 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In a conventional copper converter, the blowing of air or oxygen is done from

Options :

1. ✖ Top of the converter

2. ✖ Bottom of the converter

3. ✔ Side of the converter

4. ✖ No blowing is required

Question Number : 161 Question Id : 77951813769 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which reducing agent is used in the extraction of magnesium from calcined dolomite in Pidgeon process?

Options :

1. ✖ Carbon

2. ✔ Ferro-silicon

3. ✖ Silicon

4. ✖ Sodium

Question Number : 162 Question Id : 77951813770 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Titanium is produced by ..... Reduced with magnesium

Options :

1. ✖ TiO_2

2. ✔ $TiCl_4$

3. ✖ TiF_4

4. ✖ $TiFe_2$

Question Number : 163 Question Id : 77951813771 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Imperial smelting process is used for extraction of

Options :

1. ✖ Thorium

2. ✖ Magnesium

3. ✖ Titanium

4. ✔ Zinc

Question Number : 164 Question Id : 77951813772 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Common impurity metal present in commercial Zirconium metal

Options :

1. ✖ Titanium

2. ✖ Iron

3. ✔ Hafnium

4. ✖ Magnesium

Question Number : 165 Question Id : 77951813773 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Units of Brinell hardness Number is

Options :

1. ✖ Kilogram-millimetre

2. ✖ Kilogram per millimetre

3. ✖ Kilogram-millimetre square

4. ✔ Kilogram per millimetre square

Question Number : 166 Question Id : 77951813774 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The limiting stress below which the material can be subjected to an infinite number of cycle without failure is called ……

Options :

1. ✖ Maximum repeated stress

2. ✖ Average stress

3. ✖ True stress

4. ✔ Endurance Limit

Question Number : 167 Question Id : 77951813775 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The creep rate decreases in ……..stage of creep

Options :

1. ✔ Primary

2. ✖ Secondary

3. ✖ Tertiary

4. ✖ Quartenary

Question Number : 168 Question Id : 77951813776 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Intergranular fracture occurs mostly ……

Options :

1. ✖ Below Equi-cohesive temperature

2. ✔ Above Equi-cohesive temperature

3. ✖ At Equi-cohesive temperature

4. ✖ At absolute Temperature

Question Number : 169 Question Id : 77951813777 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following term refer to the ability of a material to resist elastic deformation

Options :

1. ✖ Resilience

2. ✖ Toughness

3. ✔ Stiffness

4. ✖ Hardness

Question Number : 170 Question Id : 77951813778 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

X-ray testing in materials inspection is primarily used to detect

Options :

1. ✔ Sub-Surface defects such as cracks, voids and inclusions

2. ✖ Surface hardness variations

3. ✖ Tensile strength of the material

4. ✖ Corrosion rate on the surface

Question Number : 171 Question Id : 77951813779 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In impact testing, Charpy specimen has a …….. cross section.

Options :

1. ✖ Circular

2. ✖ Rectangular

3. ✖ Conical

4. ✔ Square

Question Number : 172 Question Id : 77951813780 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Bragg's law mathematically expressed as

Options :

1. ✔ $n\lambda = 2d\ sin\theta$

2. ✖ $n\lambda = 2d\ cos\theta$

3. ✖ $n\lambda = 2d\ tan\theta$

4. ✖ $n\lambda = 2d\ cot\theta$

Question Number : 173 Question Id : 77951813781 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The preferred slip plane for FCC is

Options :

1. ✖ (101)

2. ✔ (111)

3. ✖ (100)

4. ✖ (000)

Question Number : 174 Question Id : 77951813782 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Rotary swaging is …….. operation

Options :

1. ✖ Rolling

2. ✔ Forging

3. ✖ Extrusion

4. ✖ Sheet metal forming

Question Number : 175 Question Id : 77951813783 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

For given reduction and frictional conditions , if the diameter of rolls is increased , the rolling load

Options :

1. ✔ Increases

2. ✖ Decreases

3. ✖ Unaffected

4. ✖ Becomes zero

Question Number : 176 Question Id : 77951813784 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

With the increase in annealing time of cold worked metals, its recrystallisation temperature

Options :

1. ✖ Increases

2. ✔ Decreases

3. ✖ Remains same

4. ✖ Depends upon type of metal

Question Number : 177 Question Id : 77951813785 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Flange wrinkling is the defect found in

Options :

1. ✖ Rolling

2. ✖ Forging

3. ✖ Bending

4. ✔ Deep drawing

Question Number : 178 Question Id : 77951813786 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Solid solution strengthening of an alloy result when alloying addition forms

Options :

1. ✖ Second phase

2. ✖ Precipitates

3. ✔ Single phase

4. ✖ Eutectic mixture

Question Number : 179 Question Id : 77951813787 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

During extrusion, the deformation is result of following forces

Options :

1. ✖ Tensile

2. ✖ Centrifugal

3. ✔ Compression

4. ✖ Bending

Question Number : 180 Question Id : 77951813788 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In edge dislocation, the burger's vector is _____ to the dislocation line

Options :

1. ✖ Parallel

2. ✖ At an angle of 45º

3. ✔ Perpendicular

4. ✖ At an angle of 75º

Question Number : 181 Question Id : 77951813789 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is the surface defect?

Options :

1. ✔ Cracks

2. ✖ Vacancy

3. ✖ Screw dislocation

4. ✖ Edge dislocation

Question Number : 182 Question Id : 77951813790 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The following operations are involved in the producing powder metallurgy parts. Arrange then in sequence

P. Atomisation Q. Sintering R. Compaction S. blending

Options :

1. ✔ P,S,R,Q

2. ✖ R,P,Q,S

3. ✖ R,S,Q,P

4. ✖ S,P,Q,R

Question Number : 183 Question Id : 77951813791 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In centrifugal casting, when internal cavity or complex hollow section is required, the core is usually made of

Options :

1. ✖ Metal alloy

2. ✖ Plastic

3. ✖ Wood

4. ✔ Sand or refractory material

Question Number : 184 Question Id : 77951813792 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Draft on pattern for casting is

Options :

1. ✖ For machining allowance

2. ✖ For shrinkage allowance

3. ✔ Tapered to facilitate its easy removal from mould

4. ✖ For Machining allowance

Question Number : 185 Question Id : 77951813793 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Toys and statues are cast by …… casting process

Options :

1. ✔ Slush

2. ✖ Die

3. ✖ Centrifugal

4. ✖ Continuous

Question Number : 186 Question Id : 77951813794 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In white cast iron, carbon is present as……..

Options :

1. ✖ Flake graphite

2. ✖ Spheroidal graphite

3. ✖ Temper carbon nodules

4. ✔ Cementite

Question Number : 187 Question Id : 77951813795 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Bentonite is generally used in moulding sand to provide

Options :

1. ✖ High refractories of the mould

2. ✖ Improved hot strength of the mould

3. ✔ Strength and plastically of the moulding sand

4. ✖ Edge hardness of the mould

Question Number : 188 Question Id : 77951813796 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Dental alloys are generally cast by ..... casting processes

Options :

1. ✖ Dry sand

2. ✖ Sodium silicate

3. ✔ Investment

4. ✖ True centrifugal

Question Number : 189 Question Id : 77951813797 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

Cold shuts are casting defects

Options :

1. ✖ Which occur due to some sand shearing from the cope surfaces

2. ✖ Which take the form of interval voids or surface depression due to excessive gaseous material not able to escape

3. ✖ Which occur due to discontinuity in metal casting resulting from hindered contraction

4. ✔ Caused by two streams of metals that are too cold to fuse property

Question Number : 190 Question Id : 77951813798 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The Function of gate is to

Options :

1. ✔ Feed the casting at a rate consistent with the rate of solidification

2. ✖ Act as reservoir of molten metal

3. ✖ Feed molten metal from pouring basin to gate

4. ✖ It will not feed the molten metal

Question Number : 191 Question Id : 77951813799 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Surfaces to be machined are marked on the pattern by which of the following colour?

Options :

1. ✖ Black

2. ✔ Red

3. ✖ Yellow

4. ✖ blue

Question Number : 192 Question Id : 77951813800 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Fettling operation is a

Options :

1. ✖ Technique for calculating riser and gating design

2. ✔ Operation performed for the cleaning of casting

3. ✖ Newly introduced core-making process

4. ✖ Tool used to ram the sand mould

Question Number : 193 Question Id : 77951813801 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Oxygen to acetylene ratio in carburising flame is

Options :

1. ✔ 0.9:1

2. ✖ 1:2

3. ✖ 2:1

4. ✖ 1:2.5

Question Number : 194 Question Id : 77951813802 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Gases used in the case of tungsten inert gas welding are

Options :

1. ✖ Argon and neon

2. ✖ Neon and helium

3. ✔ Argon and helium

4. ✖ Carbon dioxide and neon

Question Number : 195 Question Id : 77951813803 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Thermit welding comprises of

Options :

1. ✖ Charcoal and iron oxide

2. ✖ Charcoal and aluminium

3. ✖ Charcoal and iron ore

4. ✔ Aluminium and iron oxide

Question Number : 196 Question Id : 77951813804 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Tip of the electrode used in spot welding are made of

Options :

1. ✖ Mild steel

2. ✔ Copper

3. ✖ Soft solder

4. ✖ Aluminium

Question Number : 197 Question Id : 77951813805 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

The Coating material for welding electrodes is termed as the

Options :

1. ✔ Flux

2. ✖ Slag

3. ✖ Binder

4. ✖ Deoxidiser

Question Number : 198 Question Id : 77951813806 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Which of the following is solid state welding joining process?

Options :

1. ✖ Gas tungsten arc welding

2. ✖ Resistance spot welding

3. ✔ Friction welding

4. ✖ Submerged arc welding

Question Number : 199 Question Id : 77951813807 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

Preheating of Base metal during welding is required to

Options :

1. ✖ Reduce heat input

2. ✖ Increase heat input

3. ✖ Increase cooling rate

4. ✔ Decreases cooling rate

Question Number : 200 Question Id : 77951813808 Question Type : MCQ
Correct Marks : 1 Wrong Marks : 0

In brazing process, the liquid metal fills the gap by which one of the following means?

Options :

1. ✔ Capillary infiltration

2. ✖ Gravity infiltration

3. ✖ Pressure infiltration

4. ✖ Vacuum infiltration