

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
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Metallurgical Engineering

Group Number :	1
Group Id :	77951869
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
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Break time :	0
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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 $A^2 + B = A^2 B$ 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 $|\text{adj}(\text{adj}(\text{adj}A))| = 12^4$, then the value of $|A^{-1}\text{adj}A| = \underline{\hspace{2cm}}$

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 $|2A| = 64$, $B = \text{adj}A$ then $|\text{Adj}B| = \underline{\hspace{2cm}}$

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 $\sin \theta + \cos \theta = \frac{1}{5}$ and $0 \leq \theta < \pi$ 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 $f(x) = S\sin^6 x + C\cos^6 x$ 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

$C\cos 20^\circ + C\cos 80^\circ - \sqrt{3}C\cos 50^\circ =$ _____

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 $A = \sin 45^\circ + \cos 45^\circ$ and $B = \sin 44^\circ + \cos 44^\circ$ 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 $C \cot \frac{A}{2} = 3 \tan \frac{C}{2}$ 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 $\triangle ABC$, 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

$\sec 855^\circ = \underline{\hspace{2cm}}$

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 $\sin x = \frac{x}{10}$ is $\underline{\hspace{2cm}}$

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 $\sin 5x = 16\sin^5 x (n \in \mathbb{Z})$?

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

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 $|z| = \underline{\hspace{2cm}}$

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. ✘ $k < 5$ 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

$\lim_{x \rightarrow 0} \left(\frac{|x|}{x} + x + 2 \right) = \underline{\hspace{2cm}}$

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

$$\lim_{x \rightarrow 0} \frac{e^{x^2} - \cos x}{\sin^2 x} = \underline{\hspace{2cm}}$$

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. ✗ $\tan x$

2. ✗ $x[x]$

3. ✓ $\frac{|x|}{x}$

4. ✗ $\cot x$

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. ✔ $(-\infty, \infty) - \{0\}$

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. ✔ $2 \tan^{-1} \sqrt{x+99}$

4. ✘ $2 \tan^{-1} \sqrt{x+100}$

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. ✘ $x^2 e^x + c$

3. ✘ $(x+1)e^x + c$

4. ✔ $(x^2 + 1)e^x + c$

Question Number : 40 Question Id : 77951813648 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

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

$$\int_a^b (|x-a| + |x-b|) dx = \text{_____}, (0 < a < b)$$

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

$$\int_0^2 [x^2] dx = \text{_____}$$

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 $\left(\frac{d^4 y}{dx^4} + \frac{d^2 y}{dx^2}\right)^{\frac{5}{2}} = 10 \frac{d^2 y}{dx^2}$ 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. ✔ $x dx + y dy = 0$

4. ✘ $x dy + y dx = 0$

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. ✘ $x \operatorname{cosec} x$

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

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

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 $(e^y + 1) \cos x dx + e^y \sin x dy = 0$ passes

through the point $(\frac{\pi}{2}, 0)$, then the value of $e^{y(\frac{\pi}{6})}$ 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. ✘

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°

2. ✘ 60°

3. ✘ 90°

4. ✔ 120°

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

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

Options :

1. ✔ 45°

2. ✘ 60°

3. ✘ 90°

4. ✘ 120^0

Question Number : 56 Question Id : 77951813664 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

The length of a vector $(3\hat{i} + \hat{j} + 2\hat{k})$ 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. ✔

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° with the horizontal. The maximum height reached by the ball is ($g = 10 \text{ ms}^{-2}$)

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 $(2\hat{i}+3\hat{j}-\hat{k}) \text{ ms}^{-2}$. If the displacement made by the body is $(3\hat{i}-\hat{j} + 2\hat{k}) \text{ m}$ 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 ($g = 10 \text{ ms}^{-2}$)

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 Å
2. ✘ 2.2 eV, 2000 Å
3. ✘ 2.2 eV, 4000 Å
4. ✘ 3.1 eV, 2000 Å

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. ✔ $\text{C}_2\text{H}_5\text{OH}$

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. ✔ $\text{Ca}(\text{HCO}_3)_2$

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 :

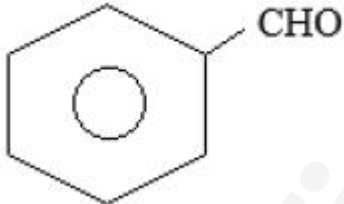
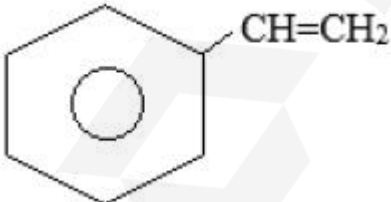
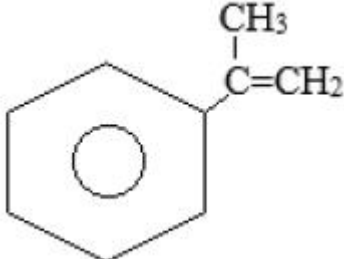
1. ✘ Neoprene rubber
2. ✘ Natural rubber
3. ✔ Urea - formaldehyde resin
4. ✘ Polytetrafluoroethylene

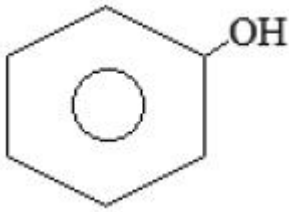
Question Number : 95 Question Id : 77951813703 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

Buna-S is a polymer of monomers X and Y. If X is $\text{CH}_2 = \text{CH} - \text{CH} = \text{CH}_2$, 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

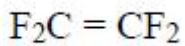
Options :

1. ✘ $F_2C = CF(Cl)$

2. ✘ $F_2C = CCl_2$

3. ✘ $F_2C = C(Br)Cl$

4. ✔



Question Number : 98 Question Id : 77951813706 Question Type : MCQ

Correct Marks : 1 Wrong Marks : 0

The major component of biogas is

Options :

1. ✓ CH₄

2. ✗ CO

3. ✗ N₂

4. ✗ NH₃

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 O₃ 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

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. ✘

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. ✗

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

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 shift TTT curve towards right side is

Options :

1. ✗ Nickel
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

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. ✗

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 instage of creep

Options :

1. ✓ Primary
2. ✗ Secondary
3. ✗ Tertiary
4. ✗ Quaternary

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 45°
3. ✔ Perpendicular
4. ✘ At an angle of 75°

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 them 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 plasticity 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 properly

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

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