Question Paper Preview

Question Paper Name:	Metallurgical Engineering 11th May 2019 Shift1
Subject Name:	Metallurgical Engineering
Duration:	180
Total Marks:	200
Display Marks:	No
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Mathematics

Number of Questions:	50
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 1 Question Id : 8946584409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let $M=(a_{ij})$ be a 10×10 matrix such that $a_{ij}=\begin{cases}1, & \text{if } i+j=11\\ 0, & \text{otherwise}\end{cases}$. Then, the determinant of M is _____.

Options :

1. 0

2. 1

3. -1

4. 11

Question Number : 2 Question Id : 8946584410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let A and B be two square matrices of order n. If $AB=A, BA=B$ then $A^2+B^2=$ ___.

Options :

1. AB

2. $A-B$

3. 0

4. $A+B$

Question Number : 3 Question Id : 8946584411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider the system of linear equations $x+y+z=3, x-y-z=4, x-5y+\alpha z=6$. Then, the value of α for which this system has an infinite number of solutions is _____.

Options :

1. -5

2. 5

3. 3

4. 1

Question Number : 4 Question Id : 8946584412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $A(\alpha,\beta)=\begin{pmatrix}\cos\alpha & \sin\alpha & 0\\ -\sin\alpha & \cos\alpha & 0\\ 0 & 0 & e^{\beta}\end{pmatrix}$, then the inverse of the matrix $A(\alpha,\beta)$ is _____.

Options :

1. $A(\alpha,\beta)$

2. $A(\alpha,-\beta)$

3. $A(-\alpha,-\beta)$

4. $A(-\alpha,\beta)$

Question Number : 5 Question Id : 8946584413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The rational fraction $\frac{x^2+1}{(x^2+4)(x-2)}$ is equal to _____

Options :

1. $\frac{3x+6}{8(x^2+4)}+\frac{5}{4(x-2)}$

2. $\frac{3x+6}{4(x^2+4)}+\frac{5}{8(x-2)}$

3. $\frac{3x+6}{8(x^2+4)}+\frac{5}{8(x-2)}$

4. $\frac{3x+6}{(x^2+4)}+\frac{5}{(x-2)}$

Question Number : 6 Question Id : 8946584414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\log_2 3=a, \log_3 5=b, \log_7 2=c$, then $\log_{140} 63=$ _____.

Options :

1. $\frac{1-2ac}{2c+abc+1}$

2. $\frac{1-2ac}{2c-abc-1}$

3. $\frac{1+2ac}{2c-abc-1}$

4. $\frac{1+2ac}{2c+abc+1}$

Question Number : 7 Question Id : 8946584415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\cos\frac{2\pi}{7}+\cos\frac{4\pi}{7}+\cos\frac{6\pi}{7}=$ _____.

Options :

1. 1

2. $\frac{1}{2}$

3. $\frac{-1}{2}$

4. 0

Question Number : 8 Question Id : 8946584416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the angles A, B and C of a triangle are in an arithmetic progression and if a, b and c denote the lengths of the sides opposite to A, B and C respectively, then the value of the expression $\frac{a}{c}\sin 2C+\frac{c}{a}\sin 2A$ is __.

Options :

1. $\sqrt{3}$

2. $\frac{\sqrt{3}}{2}$

3. 1

4. $\frac{1}{2}$

Question Number : 9 Question Id : 8946584417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\sin x+\sin y=\frac{1}{4}$ and $\cos x+\cos y=\frac{1}{3}$, then $\cot(x+y)=$ _____.

Options :

1. $\frac{7}{24}$

2. $\frac{24}{7}$

3. $\frac{3}{4}$

4. 1

Question Number : 10 Question Id : 8946584418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\sin(x^\circ+28^\circ)=\cos(3x^\circ-78^\circ)$ and $0^\circ<x^\circ<90^\circ$, then, which of the following is the value of x°?

Options :

1. 50°

2. 30°

3. 16°

4. 8°

Question Number : 11 Question Id : 8946584419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $x = \tan\left(\text{Cosec}^{-1}\frac{65}{63}\right)$ and $y = \sec^2\left(Cot^{-1}\frac{1}{2}\right) + \cos ec^2\left(Tan^{-1}\frac{1}{3}\right)$, then $(x, y) =$ _____.

Options :

1. $\left(\frac{63}{16}, 15\right)$

2. $\left(\frac{16}{63}, 15\right)$

3. $\left(\frac{63}{16}, 5\right)$

4. $\left(\frac{16}{63}, 5\right)$

Question Number : 12 Question Id : 8946584420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The equation $\text{Tan}^{-1}\left(\frac{x+1}{x-1}\right) + T\,\text{an}^{-1}\left(\frac{x-1}{x}\right) = T\,\text{an}^{-1}(-7)$ has _____.

Options :

1. unique solution $x = 2$

2. two solutions $x = 1, 2$

3. no solution

4. infinite number of solutions

Question Number : 13 Question Id : 8946584421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a triangle ABC, let a, b and c denote the lengths of the sides opposite to A, B and C respectively. If $\frac{1}{a+c}+\frac{1}{b+c}=\frac{3}{a+b+c}$, then the angle C is ____.

Options :

1. 30°

2. 90°

3. 60°

4. 45°

Question Number : 14 Question Id : 8946584422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\sin hx = 3$ then $x =$ _____.

Options :

1. $\log(3+\sqrt{10})$

2. $\log(3-\sqrt{10})$

3. $\log(6+\sqrt{10}$

4. 1

Question Number : 15 Question Id : 8946584423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is NOT true for the complex numbers z_1 and z_2 ?

Options :

1. $\frac{z_1}{z_2}=\frac{z_1\overline{z}_2}{|z_2|^2}$

2. $|z_1+z_2|\le|z_1|+|z_2|$

3. $|z_1+z_2|\le\big||z_1|-|z_2|\big|$

4. $|z_1+z_2|^2+|z_1-z_2|^2=2|z_1|^2+2|z_2|^2$

Question Number : 16 Question Id : 8946584424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a complex number $z=\frac{\sqrt{3}}{2}+i\frac{1}{2}$, then z^4 is _____.

Options :

1. $2\sqrt{2}+2i$

2. $\frac{-1}{2}+i\frac{\sqrt{3}}{2}$

3. $\frac{\sqrt{3}}{2}-i\frac{1}{2}$

4. $\frac{\sqrt{3}}{8}-i\frac{1}{8}$

Question Number : 17 Question Id : 8946584425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The equation of the straight line which makes intercepts r and s on the coordinate axes such that $r+s=5$ and $rs=6$ is $ax+by+c=0$, then $a+b+c=$ ____ .

Options :

1. 11

2. 5

3. -7

4. -1

Question Number : 18 Question Id : 8946584426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a straight line $ax+by+\sqrt{5}=0$ touches the circle $x^2+y^2=5$, then which of the following is TRUE?

Options :

1. $5(a^2+b^2)=1$

2. $a^2+b^2=\sqrt{5}$

3. $a^2+b^2=1$

4. $\sqrt{a^2+b^2}=5$

Question Number : 19 Question Id : 8946584427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a chord of length 12 cm is at a distance of $4\sqrt{10}$ cm from the centre of the circle, then the radius of the circle is _____.

Options :

1. 14 cm

2. $\sqrt{304}$ cm

3. 4 cm

4. $\sqrt{124}$ cm

Question Number : 20 Question Id : 8946584428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The 2019^{th} derivative of the function $(x-1)e^{-x}$ is _____

Options :

1. $\frac{x-2019}{e^x}$

2. $\frac{2019-x}{e^x}$

3. $\frac{x-2020}{e^x}$

4. $\frac{2020-x}{e^x}$

Question Number : 21 Question Id : 8946584429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $z = f(x+ct)+\varphi(x-ct)$, then $\frac{\partial^2 z}{\partial t^2} =$ _____.

Options :

1. $c^2\frac{\partial^2 z}{\partial x^2}$

2. $-c^2\frac{\partial^2 z}{\partial x^2}$

3. $\frac{1}{c^2}\frac{\partial^2 z}{\partial x^2}$

4. $-\frac{1}{c^2}\frac{\partial^2 z}{\partial x^2}$

Question Number : 22 Question Id : 8946584430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $x = r\cos\theta,\ y = r\sin\theta$ and $U = \frac{f(\theta)}{r}$ then $x\frac{\partial U}{\partial x} + y\frac{\partial U}{\partial y} =$ _____.

Options :

1. 0

2. U

3. $-U$

4. $2U$

Question Number : 23 Question Id : 8946584431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let $f(x+y) = f(x)f(y),\ \forall x, y$ and $f'(0) = 5,\ f(2019) = 15$. Then the value of $f'(2019)$ is _____.

Options :

1. 3

2. 75

3. $\frac{1}{3}$

4. $\frac{1}{75}$

Question Number : 24 Question Id : 8946584432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The set of values of x for which the function $f(x) = 2x^3 - 9x^2 + 12x + 4$ is increasing is _____.

Options :

1. $1 < x < 2$

2. all $x \in \mathbb{R}$

3. $\mathbb{R} - [1, 2]$

4. $x \geq 2$

Question Number : 25 Question Id : 8946584433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\lim_{x \to \infty} x\left(\log\left(1+\frac{x}{2}\right)-\log\left(\frac{x}{2}\right)\right) =$ _____.

Options :

1. e^2

2. ∞

3. 1

4. 2

Question Number : 26 Question Id : 8946584434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $f(x, y, z) = x^3 + xz^2 + y^3 + xyz$, $x = e^t$, $y = \cos t$, $z = t^3$ then $\frac{df}{dt}$ at $t = 0$ is _____.

Options :

1. 2

2. 4

3. e

4. 3

Question Number : 27 Question Id : 8946584435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is the value of $5050 \times \frac{\int_0^1 (1-(1-x)^{50})^{100} x^{49} dx}{\int_0^1 (1-x^{50})^{101} x^{49} dx}$?

Options :

1. 5100

2. 1

3. 5050

4. $\frac{1}{2}$

Question Number : 28 Question Id : 8946584436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\int_0^1 \max\left\{x, \frac{1}{2} - x\right\} dx =$ _____.

Options :

1. 0

2. $\frac{1}{2}$

3. $\frac{9}{16}$

4. $\frac{9}{8}$

Question Number : 29 Question Id : 8946584437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\lim_{n \to \infty} \frac{1}{n^6} \sum_{k=1}^{n} k^5 =$ _____.

Options :

1. $\frac{1}{6}$

2. $\frac{1}{5}$

3. 1

4. 6

Question Number : 30 Question Id : 8946584438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$\int_{-1}^{1} \frac{x^{15}(1-x^2)^{12}}{(1+x^2)^8} dx =$ _____.

Options :

1. 0

2. $\frac{22}{7} - \pi$

3. $\frac{2}{105}$

4. $\frac{71}{15} - \frac{3\pi}{4}$

Question Number : 31 Question Id : 8946584439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The area of the region bounded by the curves $y = 2 - x^2$ and $y = -x$ is _____.

Options :

1. 1

2. $\frac{8}{19}$

3. $\frac{35}{4}$

4. $\frac{27}{6}$

Question Number : 32 Question Id : 8946584440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The volume of the solid obtained by revolving the region bounded by the curves $y = x^3$, $y = 8$ and $x = 0$ about the y-axis is _____

Options :

1. $\frac{96}{5}$

2. $\frac{96\pi}{5}$

3. $\frac{32\pi}{5}$

4. $\frac{32}{5}$

Question Number : 33 Question Id : 8946584441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_0^{\pi} \theta \sin^2\theta \cos^4\theta \, d\theta$ is _____.

Options :

1. $\frac{\pi^2}{32}$

2. $\frac{\pi}{32}$

3. $\frac{\pi^2}{16}$

4. $\frac{\pi}{16}$

Question Number : 34 Question Id : 8946584442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The average value of the function $f(x)=4-x^2$ over the interval $[-1, 3]$ is _____.

Options :

1. 5

2. $\frac{20}{3}$

3. $\frac{5}{3}$

4. 1

Question Number : 35 Question Id : 8946584443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The differential equation $x\frac{dy}{dx}=y+x^2,\ x>0$ satisfying $y(0)=0$ has _____.

Options :

1. infinitely many solutions

2. no solution

3. a unique solution

4. exactly two solutions

Question Number : 36 Question Id : 8946584444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The differential equation $(a\,xy^3+y\cos x)dx+(x^2y^2+b\sin x)dy=0$ is an exact differential equation for _____.

Options :

1. $a=1, b=\frac{3}{2}$

2. $a=\frac{3}{2}, b=1$

3. $a=\frac{2}{3}, b=1$

4. $a=1, b=\frac{2}{3}$

Question Number : 37 Question Id : 8946584445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\sin x$ is a solution of the differential equation $\frac{d^4y}{dx^4}+2\frac{d^3y}{dx^3}+6\frac{d^2y}{dx^2}+2\frac{dy}{dx}+5y=0$,

then the general solution is _____.

Options :

1. $y=c_1\sin x+c_2\cos x+e^{-x}(c_3\sin 2x+c_4\cos 2x)$

2. $y=c_1\sin x+c_2\cos x+c_3\sin 2x+c_4\cos 2x$

3. $y=c_1\sin x+c_2\cos x+c_3e^{-3x}+c_4e^{-2x}$

4. $y=c_1\sin x+c_2\cos x+c_3e^{3x}+c_4e^{2x}$

Question Number : 38 Question Id : 8946584446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $D\equiv\frac{d}{dx}$, then $\frac{1}{D^2-4D+13}(6e^{2x}\sin 3x)$ is _____.

Options :

1. $-xe^{2x}\cos 3x$

2. $xe^{2x}\cos 3x$

3. $-xe^{2x}\sin 3x$

4. $xe^{2x}\sin 3x$

Question Number : 39 Question Id : 8946584447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The general solution of $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}}-\frac{y}{\sqrt{x}}\right)\frac{dx}{dy}=1$ is _____.

Options :

1. $y=e^{2\sqrt{x}}\ (2\sqrt{x}+c)$

2. $y=2\sqrt{x}\ e^{2\sqrt{x}}+c$

3. $y=2\sqrt{x}\ e^{-2\sqrt{x}}+c$

4. $y=e^{-2\sqrt{x}}\ (2\sqrt{x}+c)$

Question Number : 40 Question Id : 8946584448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Let y be the solution of the differential equation $\frac{dy}{dx}+y=x,\ x\in\mathbb{R}$ and $y(-1)=0$.

Then, y(1) is equal to _____.

Options :

1. $\frac{2}{e}-\frac{2}{e^2}$

2. $2e^{-2}$

3. $2-\frac{2}{e}$

4. $2-2e$

Question Number : 41 Question Id : 8946584449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the substitution $x=X+h,\ y=Y+k$ transforms the differential equation $(y-x+1)dy-(y+x+2)dx=0$ into a homogeneous equation, then the value of (h,k) is _____.

Options :

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

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

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

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

Question Number : 42 Question Id : 8946584450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The general solution of $\frac{dy}{dx}-y=y^2(\sin x+\cos x)$ is _____.

Options :

1. $y=\frac{1}{ce^x-\sin x}$

2. $y=ce^{-x}-e^x\sin x$

3. $y = ce^{-x} - \sin x$

4. $y = \dfrac{1}{ce^{-x} - \sin x}$

Question Number : 43 Question Id : 8946584451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of the function $f(t) = \begin{cases} \sin t, & \text{for } 0 \le t \le \pi \\ 0, & \text{for } t > \pi \end{cases}$

is _____.

Options :

1. $\dfrac{1}{(1+s^2)}$ for all $s > 0$

2. $\dfrac{1}{(1+s^2)}$ for all $s < \pi$

3. $\dfrac{(1+e^{-\pi s})}{(1+s^2)}$ for all $s > 0$

4. $\dfrac{e^{-\pi s}}{(1+s^2)}$ for all $s > 0$

Question Number : 44 Question Id : 8946584452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The inverse Laplace transform of $\dfrac{5}{s} - \dfrac{3e^{-3s}}{s} - \dfrac{2e^{-7s}}{s}$ is _____.

Options :

1. $f(x) = \begin{cases} 5, & 0 < x < 3 \\ 0, & 3 < x < 7 \\ 2, & x > 7 \end{cases}$

2. $$f(x)=\begin{cases}5, & 0<x<7\\ 2, & x>7\end{cases}$$

3. $$f(x)=\begin{cases}5, & 0<x<3\\ 2, & 3<x<7\\ 0, & x>7\end{cases}$$

4. $$f(x)=\begin{cases}5, & 0<x<7\\ 0, & x>7\end{cases}$$

Question Number : 45 Question Id : 8946584453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of a function $f(x)$ is $F(s)=\frac{1}{s^3+2s^2+2s}$ Then, $\lim_{x\to 0} f(x)=$

_____.

Options :

1. 0

2. 3

3. ∞

4. $\frac{1}{2}$

Question Number : 46 Question Id : 8946584454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of the solution of the differential equation $\frac{dy}{dx}-2y=e^{5x}$ with the initial condition $y(0)=3$ is _____.

Options :

1. $\frac{1}{3(s-2)}+\frac{1}{3(s-5)}$

2. $\frac{8}{3(s-2)}+\frac{1}{s-5}$

3. $\frac{8}{3(s-2)}+\frac{1}{3(s-5)}$

4. $\frac{8}{s-2}+\frac{1}{3(s-5)}$

Question Number : 47 Question Id : 8946584455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $L(y(x))=Y(s)$ and $y(x)=x^3+\int_0^x \sin(x-t)\,y(t)dt$ then $\frac{1}{6}Y(s)=$ _____.

Options :

1. $\left(\frac{1}{s^4}+\frac{1}{s^6}\right)$

2. $\left(\frac{1}{s^3}+\frac{1}{s^5}\right)$

3. $\left(\frac{1}{s^3}+\frac{1}{s^7}\right)$

4. $\left(\frac{1}{s}+\frac{1}{s^3}\right)$

Question Number : 48 Question Id : 8946584456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For $x>0$, $\int_0^\infty \frac{\sin xt}{t}dt$ is _____.

Options :

1. 0

2. $\frac{\pi}{2x}$

3. $\frac{1}{x}$

4. $\frac{\pi}{2}$

Question Number : 49 Question Id : 8946584457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $f(x)=\frac{1}{2}a_0+\sum_{n=1}^{\infty}(a_n\cos nx+b_n\sin nx)$ is the Fourier series of the function

$f(x)=\begin{cases}0, & -\pi\le x<0\\ \pi, & 0\le x\le\pi\end{cases}$ then, which of the following is TURE?

Options :

1. $a_n=0$, for all $n\ge 0$

2. $a_0=\frac{\pi}{2}$ and $a_n=0$, for all $n\ge 1$

3. $b_n\neq 0$, for all $n\ge 1$

4. $a_0=\pi$ and $a_n=0$, for all $n\ge 1$

Question Number : 50 Question Id : 8946584458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A function $f(x)$ is such that $f(x+2\pi)=f(x)$ and $f(x)=x, -\pi\le x\le\pi$. The Fourier series of $f(x)$ is _____.

Options :

1. $2(\sin x - \frac{1}{2}\sin 2x + \frac{1}{3}\sin 3x - .....)$

2. $2(\sin x + \frac{1}{2}\sin 2x + \frac{1}{3}\sin 3x + ...)$

3. $2(\cos x - \frac{1}{2}\cos 2x + \frac{1}{3}\cos 3x - .....)$

4. $2(\cos x + \frac{1}{2}\cos 2x + \frac{1}{3}\cos 3x + ...)$

Physics

Number of Questions:	25
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 51 Question Id : 8946584459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The dimensional formula for gravitational constant is_____.

Options :

1. $L^3T^{-2}M^{-1}$

2. $L^3T^2M^{-1}$

3. $L^2T^3M^{-2}$

4. $L^3T^1M^{-3}$

Question Number : 52 Question Id : 8946584460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The dimensions of the quantities in one of the following pairs are same. Identify the pairs.

Options :

1. torque and work

2. angular momentum and work

3. energy and Young's modules

4. light year and wavelength

Question Number : 53 Question Id : 8946584461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is not correct?

Options :

1. $j \times i = - k$

2. $k \times j = - i$

3. $i \times k = - j$

4. $k \times i = - j$

Question Number : 54 Question Id : 8946584462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $0.5\ i + 0.8\ j + c\ k$ is a unit vector then c is_____.

Options :

1. $\sqrt{0.89}$

2. 0.2

3. 0.3

4. $\sqrt{0.11}$

Question Number : 55 Question Id : 8946584463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is correct?

Options :

1. $A.B \neq B.A$

2. $A.(B+C) = A.B + C.A$

3. $A.B = A.B - A.C$

4. $A.B = -B.A$

Question Number : 56 Question Id : 8946584464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The acceleration due to gravity on the surface of the earth is given by_____

Options :

1. G

2. GM/R^2

3. GM/R

4. GM

Question Number : 57 Question Id : 8946584465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of g is maximum at_____.

Options :

1. equator

2. Pole

3. higher altitudes

4. at the centre of the earth

Question Number : 58 Question Id : 8946584466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When the speed of rotation of earth increases your weight_____

Options :

1. increases

2. decreases

3. remains constant

4. becomes zero

Question Number : 59 Question Id : 8946584467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of G is zero at_____

Options :

1. nowhere

2. the centre of the earth

3. surface of the earth

4. pole

Question Number : 60 Question Id : 8946584468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the linear momentum is increased by 50%, the kinetic energy will be increased by_____

Options :

1. 50%

2. 100%

3. 125%

4. 25%

Question Number : 61 Question Id : 8946584469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A metallic block slides down a smooth inclined plane when released from the top, while the other falls freely from the same point, then_____

Options :

1. both will reach the ground with the same velocity

2. both will reach the ground together

3. both will reach the ground travelling with same acceleration

4. the block sliding down the plane will strike earlier

Question Number : 62 Question Id : 8946584470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A long spring is stretched by 2 cm and its potential energy is u. If the spring is stretched by 10 cm, then the potential energy stored in it will be_____.

Options :

1. u/24

2. u/5

3. 5u

4. 25u

Question Number : 63 Question Id : 8946584471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two masses of 1 gm and 4 gm are moving with equal kinetic energies. The ratio of the magnitudes of their linear momentum is _____

Options :

1. 4:1

2. $\sqrt{2}$:1

3. 1:2

4. 1:16

Question Number : 64 Question Id : 8946584472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A body is dropped from rest at height 0.5 m. What will be its velocity when it just strikes the ground?

Options :

1. 7 m/s

2. 9.8 m/s

3. 4.9 m/s

4. $\sqrt{9.8}$ m/s

Question Number : 65 Question Id : 8946584473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A particle moves such that its acceleration a is given by $a = -bx$ where x is the displacement from equilibrium and b is a constant. The period of Oscillation is_____ .

Options :

1. $2\Pi b$

2. $2\Pi\sqrt{b}$

3. $2\Pi/b$

4. $2\sqrt{\Pi}/b$

Question Number : 66 Question Id : 8946584474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A particle is vibrating in simple harmonic motion with amplitude of 4 cm. At what displacement from the equilibrium position is its energy half potential and half kinetic?

Options :

1. 1 cm

2. $\sqrt{2}$ cm

3. 2 cm

4. $2\sqrt{2}$ cm

Question Number : 67 Question Id : 8946584475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When a star approaches the earth, the waves are shifted towards _____

Options :

1. green colour

2. yellow colour

3. blue end

4. red end

Question Number : 68 Question Id : 8946584476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If a tuning fork of frequency 90 is sounded and moved towards an observer with a velocity equal to one tenth the velocity of sound, then the note heard by the observer will have frequency_____.

Options :

1. 100

2. 90

3. 80

4. 900

Question Number : 69 Question Id : 8946584477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

What is the most important factor which helps to recognise a person by his/her voice alone_____

Options :

1. quality

2. pitch

3. intensity

4. quality, pitch and intensity

Question Number : 70 Question Id : 8946584478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The quality of tone_____

Options :

1. decreases with loudness

2. varies inversely as amplitude

3. varies directly as pitch

4. depends on the overtones present

Question Number : 71 Question Id : 8946584479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The conduction of heat from hot body to cold body is an example of_____.

Options :

1. reversible process

2. irreversible process

3. isothermal process

4. isobaric process

Question Number : 72 Question Id : 8946584480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

From the isothermal drawn from Andrews experiment, it can be inferred that_____

Options :

1. CO_2 is a perfect gas

2. there is continuity of state

3. there is discontinuity of state

4. gases like CO_2 and H_2 cannot be liquefied

Question Number : 73 Question Id : 8946584481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A diesel cycle works at_____

Options :

1. constant volume

2. constant pressure

3. constant temperature

4. both constant volume and constant temperature

Question Number : 74 Question Id : 8946584482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The transition temperature of most low temperature superconducting elements is in the

range of _____

Options :

1. zero to 10 k

2. 10 k to 20 k

3. 20 k to 50 k

4. 50 k alone

Question Number : 75 Question Id : 8946584483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Propagation of light through fiber core is due to_____

Options :

1. diffraction

2. interference

3. total internal reflection

4. reflection

Number of Questions:	25
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 76 Question Id : 8946584484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following energy orders is correct?

Options :

1. 6s<4f<5d<6p

2. 4f<5d<6s<6p

3. 4f<6s<6p<5d

4. 6s<6p<5d<4f

Question Number : 77 Question Id : 8946584485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An element A of atomic number 11 combines with an element B of atomic number 17. The compound formed is _____.

Options :

1. Covalent AB

2. Ionic AB

3. Covalent AB_2

4. Ionic AB_2

Question Number : 78 Question Id : 8946584486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The oxidation number of 'S' in S_8, S_2F_2, H_2S respectively are _____.

Options :

1. 0, +1 and -2

2. +2, +1 and-2

3. 0, +1 and +2

4. -2, +1 and -2

Question Number : 79 Question Id : 8946584487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The elements A, B, C and D have the following electronic configurations:

A: $1S^2, 2S^2, 2P^1$

B: $1S^2, 2S^2, 2P^6, 3S^2, 3P^1$

C: $1S^2, 2S^2, 2P^6, 3S^2, 3P^3$

D: $1S^2, 2S^2, 2P^6, 3S^2, 3P^5$

The elements that belong to same group are _____.

Options :

1. A and C

2. C and D

3. A and D

4. A and B

Question Number : 80 Question Id : 8946584488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

4.9 gm of H_2SO_4 is present in 2 lit of its solution. The molarity of the solution is

_____.

Options :

1. 0.1 M

2. 0.025 M

3. 0.25 M

4. 0.01 M

Question Number : 81 Question Id : 8946584489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The molecular weight of H_3PO_4 is 98. The equivalent weight is _____ gram / equivalents.

Options :

1. 98

2. 49

3. 32.66

4. 24.5

Question Number : 82 Question Id : 8946584490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is the Bronsted acid?

Options :

1. Cl^-

2. NH_2^-

3. CH_3COO^-

4. NH_4^+

Question Number : 83 Question Id : 8946584491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The pH of 1 M KOH is ____.

Options :

1. 12

2. 11

3. 14

4. 13

Question Number : 84 Question Id : 8946584492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Froth floatation process is used for the _____.

Options :

1. Oxide ores

2. Sulphide ores

3. Chloride ores

4. Oxide ores and Chloride ores

Question Number : 85 Question Id : 8946584493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The composition of brass is _____.

Options :

1. Cu and Zn

2. Cu and Ni

3. Cu and Mn

4. Cu and Fe

Question Number : 86 Question Id : 8946584494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following statements is correct?

Options :

1. Cathode is positive terminal in an electrolytic cell

2. Cathode is negative terminal in a galvanic cell

3. Reduction occurs at cathode in either of cells

4. Oxidation occurs at cathode in either of cells

Question Number : 87 Question Id : 8946584495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the electrolysis of $CuCl_2$ solution using copper electrode, if 2.5 gm of Cu is deposited at cathode, then at anode _____.

Options :

1. 890 mL of Cl_2 at STP is liberated

2. 445 mL of O_2 at STP is liberated

3. 2.5 gm of copper is deposited

4. a decrease of 2.5 gm of mass takes place

Question Number : 88 Question Id : 8946584496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The unit of resistivity is _____.

Options :

1. Ω

2. Ω m

3. Ω /m

4. Ω m^2

Question Number : 89 Question Id : 8946584497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following metals provide cathodic protection to iron?

Options :

1. Cu and Ni

2. Al and Zn

3. Al and Cu

4. Co and Ni

Question Number : 90 Question Id : 8946584498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The chemical composition of rust is _____.

Options :

1. Fe_3O_4

2. Fe_3O_3

3. $Fe_2O_3.\ nH_2O$

4. $Fe_3O_3.\ xH_2O$

Question Number : 91 Question Id : 8946584499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

1 ppm of hardness of water is equal to _____.

Options :

1. 1 part of $CaCO_3$ hardness in 10^6 parts of water

2. 1 part of $CaCO_3$ hardness in 10^8 parts of water

3. 1 part of $CaCO_3$ hardness in 10^7 parts of water

4. 1 part of $CaCO_3$ hardness in 10^5 parts of water

Question Number : 92 Question Id : 8946584500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The temporary hardness of water is due to the presence of _____.

Options :

1. $MgCl_2$ and $CaCl_2$

2. $Ca(NO_3)_2$ and $Mg(NO_3)_2$

3. $CaSO_4$ and $MgSO_4$

4. $Ca(HCO_3)_2$ and $Mg(HCO_3)_2$

Question Number : 93 Question Id : 8946584501 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The basic buffer solution is a mixture of _____.

Options :

1. $NH_3 + NH_4Cl$

2. $HCl + NH_4Cl$

3. $NaCl + NH_4Cl$

4. $KOH + NH_4Cl$

Question Number : 94 Question Id : 8946584502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following polymers has amide linkage?

Options :

1. Terylene
2. Bakelite
3. Nylon
4. PVC

Question Number : 95 Question Id : 8946584503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The monomer of natural rubber is _____.

Options :

1. Butadiene
2. Chloroprene
3. 2-methyl 1,2 butadiene
4. 2-methyl 1,3 butadiene

Question Number : 96 Question Id : 8946584504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is a thermo setting?

Options :

1. Bakelite
2. Polyethylene
3. Nylon-6
4. Natural rubber

Question Number : 97 Question Id : 8946584505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The composition of water gas is _____.

Options :

1. CO and H_2 are combustible gases and CO_2 and N_2 are non-combustible gases

2. $CO + CO_2$ are combustible gases and H_2O and N_2 non-combustible gases

3. $CO + N_2$ are combustible gases and H_2O and H_2 are non-combustible gases

4. $N_2 + H_2$ are combustible gases and $CO + H_2O$ are non-combustible gases

Question Number : 98 Question Id : 8946584506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Earth is protected from UV radiation by _____.

Options :

1. Nitrogen layer

2. Ozone layer

3. Carbon dioxide layer

4. Oxygen layer

Question Number : 99 Question Id : 8946584507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of following statements is not correct?

Options :

1. CO is the main air pollutant

2. All pollutants are not wastes

3. Water is polluted by dissolved Oxygen

4. Lichens are pollution indicators

Question Number : 100 Question Id : 8946584508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Minamata disease is caused due to the presence of _____.

Options :

1. Cd

2. Pb

3. As

4. Hg

	Metallurgical Engineering
Number of Questions:	100
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 101 Question Id : 8946584509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following minerals of metal is adequately available in India?

Options :

1. Aluminium

2. Copper

3. Graphite

4. Uranium

Question Number : 102 Question Id : 8946584510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

_____ method is one of the principal mineral exploration methods.

Options :

1. Radioactive

2. Seismic

3. Magnetic

4. Gravitational

Question Number : 103 Question Id : 8946584511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	**Group B**
a. Collector	I. Pine oil
b. Regulator	II. Copper sulphate
c. Activator	III. Sodium ethyl xanthate
d. Frother	IV. Lime

Options :

1. a-II, b-III, c-IV, d-I

2. a-IV, b-II, c-III, d-I

3. a-III, b-IV, c-II, d-I

4. a-I, b-III, c-II, d-IV

Question Number : 104 Question Id : 8946584512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the metals listed in Group A with the corresponding ores given in Group B and find the correct answer.

Group A	**Group B**
a. Lead	I. Columbite
b. Zinc	II. Casseterite
c. Uranium	III. Galena
d. Niobium	IV. Pitchblende
	V. Sphalerite

Options :

1. a-III, b-V, c-II, d-IV

2. a-III, b-II, c-V, d-IV

3. a-III, b-V, c-IV, d-I

4. a-III, b-IV, c-V, d-II

Question Number : 105 Question Id : 8946584513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

_____metallurgical extraction methods are advantageous for lean and complex ores.

Options :

1. Pyro

2. Electro

3. Powder

4. Hydro

Question Number : 106 Question Id : 8946584514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the extraction methods listed in Group A with the metals given in Group B and find the correct answer.

Group A	**Group B**
a. Roasting followed by carbothermic reduction	I. Ti
b. Electrolysis of fused salt	II. Pb
c. Roasting followed by controlled oxidation	III. Al
d. Halide process	IV. Cu
	V. Au

Options :

1. a-II, b-III, c-IV, d-I

2. a-V, b-IV, c-III, d-I

3. a-II, b-V, c-I, d-IV

4. a-III, b-II, c-V, d-I

Question Number : 107 Question Id : 8946584515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Cyclones are primarily used for _____

Options :

1. Comminution

2. Dewatering

3. Concentration

4. Classification

Question Number : 108 Question Id : 8946584516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Chalcopyrite is an ore of _____.

Options :

1. Iron

2. Zinc

3. Copper

4. Titanium

Question Number : 109 Question Id : 8946584517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Heating of coal in absence of air at high temperature is called as _____

Options :

1. Gasification

2. Coalification

3. Run-of-mine

4. Carbonization

Question Number : 110 Question Id : 8946584518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following fuels has high calorific value?

Options :

1. Carbureted water gas

2. Water gas

3. Producer gas

4. Blast furnace gas

Question Number : 111 Question Id : 8946584519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match Group A with Group B and find the correct answer

Group A	**Group B**
a. Dulong formula	I. Ultimate analysis
b. Carbon	II. Gray body
c. Dwight-Lloyd machine	III. Sintering
d. Radiation	IV. Refractory

Options :

1. a-I, b-II, c-III, d-IV

2. a-II, b-IV, c-III, d-I

3. a-I, b-IV, c-III, d-II

4. a-III, b-I, c-IV, d-II

Question Number : 112 Question Id : 8946584520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An example for basic refractory is _____

Options :

1. Quartz

2. Dolomite

3. Silica

4. Fire clay

Question Number : 113 Question Id : 8946584521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Fire clay refractory contains _____ .

Options :

1. Al_2O_3

2. SiO_2

3. Al_2O_3 and SiO_2

4. MgO

Question Number : 114 Question Id : 8946584522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For blast furnace hearth walls_____ refractories are used.

Options :

1. Silica

2. Carbon

3. Magnesite

4. SiC

Question Number : 115 Question Id : 8946584523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which thermocouple of the following is used for temperature measurement of 1100 °C in a furnace?

Options :

1. Chromel-Alumel

2. Copper-Constantan

3. Iron-Constantan

4. Chromel-Constantan

Question Number : 116 Question Id : 8946584524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

IR pyrometers are very advantageous to measure the temperatures of _____ and above.

Options :

1. $150\ ^{\circ}C$

2. $-200\ ^{\circ}C$

3. $450\ ^{\circ}C$

4. $1300\ ^{\circ}C$

Question Number : 117 Question Id : 8946584525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the properties given in Group A with the units given in Group B and find the correct answer

Group A	Group B
a. Thermal conductivity	I. J/m^2 -s-K
b. Heat transfer coefficient	II. J/m -s-K
c. Specific heat	III. m^2/s
d. Diffusivity	IV. J/mol-K

Options :

1. a-I, b-II, c-IV, d-III

2. a-II, b-III, c-I, d-IV

3. a-II, b-I, c-IV, d-III

4. a-II, b-IV, c-III, d-I

Question Number : 118 Question Id : 8946584526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Critical value of the Gibb's energy of nucleation at equilibrium temperature is _____.

Options :

1. Infinite

2. Zero

3. Positive

4. Negative

Question Number : 119 Question Id : 8946584527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following can give information about the corrosion rate?

Options :

1. Ellingham diagram

2. Pourbaix diagram

3. Tafel extrapolation

4. EMF series

Question Number : 120 Question Id : 8946584528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following metals cannot be electroplated from aqueous electrolyte?

Options :

1. Al

2. Cu

3. Ni

4. Zn

Question Number : 121 Question Id : 8946584529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following partial derivatives is equal to $\left(\frac{\partial S}{\partial V}\right)_T$?

Options :

1. $-\left(\frac{\partial S}{\partial V}\right)_T$

2. $-\left(\frac{\partial V}{\partial T}\right)_P$

3. $\left(\frac{\partial S}{\partial V}\right)_P$

4. $-\left(\frac{\partial V}{\partial T}\right)_S$

Question Number : 122 Question Id : 8946584530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

One mole of element P is mixed with one mole of element Q. The entropy of mixing at 0 Kelvin temperature is _____

Options :

1. – R ln0.5

2. Infinity

3. Zero

4. – R ln2

Question Number : 123 Question Id : 8946584531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In Ellingham diagram, the slope of the line represent is _____

Options :

1. $-\Delta S^\circ$

2. $-\Delta H^\circ$

3. ΔS°

4. ΔH°

Question Number : 124 Question Id : 8946584532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

During the paramagnetic to ferromagnetic transition of iron, which property does abruptly change?

Options :

1. Entropy

2. Enthalpy

3. Heat capacity

4. Free energy

Question Number : 125 Question Id : 8946584533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Driving force for grain growth after completion of recrystallization is _____.

Options :

1. Grain boundary energy

2. Dislocation density

3. Vacancy concentration

4. Stored energy

Question Number : 126 Question Id : 8946584534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Iron-silicon alloy	I. Heating element
b. Ga, As	II. Ultrasonic generator
c. Nichrome	III. Transformer core
d. Quartz crystals	IV. Light emitting diode

Options :

1. a-III, b-IV, c-I, d-II

2. a-II, b-IV, c-I, d-III

3. a-I, b-III, c-IV, d-II

4. a-III, b-II, c-IV, d-I

Question Number : 127 Question Id : 8946584535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Miller indices of the common direction to (111) and (110) planes for a cubic system is _____

Options :

1. $[\bar{1}10]$

2. [110]

3. [101]

4. [111]

Question Number : 128 Question Id : 8946584536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In continuous cooling of eutectoid steel, which phase of the following does not form?

Options :

1. Fully bainitic

2. Fully Pearlitic

3. Pearlitic and bainitic

4. Martensitic

Question Number : 129 Question Id : 8946584537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the alloy names listed in Group A with the main elements present in them listed in Group B and find the correct answer

Group A	Group B
a. Babbit	I. Fe-Ni
b. Muntz metal	II. Ni-Cr-Fe
c. Invar	III. Cu-Zn
d. Inconel	IV. Sn-Sb-Cu

Options :

1. a-III, b-I, c-IV, d-II

2. a-III, b-IV, c-I, d-II

3. a-IV, b-I, c-II, d-III

4. a-IV, b-III, c-I, d-II

Question Number : 130 Question Id : 8946584538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In heterogeneous nucleation, the critical radius of the nucleus does not depend on _____.

Options :

1. Under cooling

2. Enthalpy change of product

3. Surface energy

4. Contact angle

Question Number : 131 Question Id : 8946584539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For which of the following, the complete solid solubility is possible for the alloy system?

Options :

1. Cu-Zn

2. Cu-Ni

3. Fe-Cr

4. Pb-Sn

Question Number : 132 Question Id : 8946584540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The self-diffusion in FCC metals occurs by one of the following mechanisms.

Options :

1. Interstitial

2. Substitutional

3. Interstitialcy

4. Vacancy

Question Number : 133 Question Id : 8946584541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The eutectic reaction in a binary system is represented by_____

Options :

1. Liquid = Solid1 + Solid2

2. Liquid + Solid1 = Solid2

3. Solid = Solid1 + Solid2

4. Liquid1 + Liquid2 = Solid

Question Number : 134 Question Id : 8946584542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For which unit cell of a crystal, $a = b \neq c$ and $\alpha = \beta = \gamma = 90°$?

Options :

1. Cubic

2. Rhombohedral

3. Tetragonal

4. Orthorhombic

Question Number : 135 Question Id : 8946584543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Nitriding is carried out in the region of _____

Options :

1. Ferrite

2. Ferrite and austenite

3. Austenite

4. Liquid

Question Number : 136 Question Id : 8946584544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Normalizing is carried out to obtain _____ steels.

Options :

1. Soft

2. Brittle

3. Strong

4. Coarse grained

Question Number : 137 Question Id : 8946584545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Quenching	I. Bainite
b. Maraging	II. Martensite
c. Tempering	III. Intermetallic precipitates
d. Austempering	IV. Epsilon carbide

Options :

1. a-II, b-III, c-I, d-IV
2. a-I, b-III, c-II, d-IV
3. a-II, b-III, c-IV, d-I
4. a-III, b-II, c-I, d-IV

Question Number : 138 Question Id : 8946584546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. Water medium
2. Oil medium
3. Air medium
4. No medium

Question Number : 139 Question Id : 8946584547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For wire drawing of medium carbon steels, _____ heat treatment is adopted.

Options :

1. Quenching

2. Austempering

3. Quenching and tempering

4. Patenting

Question Number : 140 Question Id : 8946584548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Agehardenable or precipitation hardenable alloys can be used _____

Options :

1. Below ageing temperature

2. Above ageing temperature

3. At solutionizing temperature

4. Upto melting point

Question Number : 141 Question Id : 8946584549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following heat treatments is given to overcome stress corrosion cracking of brass?

Options :

1. Tempering

2. Thermo-mechanical treatment

3. Annealing

4. Normalizing

Question Number : 142 Question Id : 8946584550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Decarburization can be avoided in high speed steels by _____.

Options :

1. Single stage heating

2. Two stage heating

3. Single stage quenching

4. Two stage quenching

Question Number : 143 Question Id : 8946584551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following stainless steels cannot be heat treated?

Options :

1. Ferritic

2. Austenitic

3. Martensitic

4. Precipitation-hardened

Question Number : 144 Question Id : 8946584552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Temper brittleness occurs during tempering in the range of _____

Options :

1. 350-550 °C

2. 150-250 °C

3. 0-150 °C

4. Sub-zero temperature

Question Number : 145 Question Id : 8946584553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the facilities in a steel plant listed in Group A with the associated terms in Group B and find the correct answer

Group A	Group B
a. Electric arc furnace	I. High top pressure
b. LD convertor	II. Dummy bar
c. Continuous caster	III. Slag splashing
d. Blast furnace	IV. Eccentric bottom tapping

Options :

1. a-IV, b-I, c-II, d-III
2. a-II, b-IV, c-I, d-III
3. a-IV, b-III, c-II, d-I
4. a-I, b-III, c-II, d-IV

Question Number : 146 Question Id : 8946584554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Blast furnace is a _____

Options :

1. Counter-current reactor
2. Co-current reactor
3. Cross-current reactor
4. No-current reactor

Question Number : 147 Question Id : 8946584555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The driving force for sintering of a powder compact is _____

Options :

1. Volume energy

2. Strain energy

3. Stacking fault energy

4. Surface energy

Question Number : 148 Question Id : 8946584556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In continuous casting of liquid steel, the mould is made of _____

Options :

1. Refractory oxide

2. Silicon carbide

3. Water cooled copper

4. Water cooled steel

Question Number : 149 Question Id : 8946584557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For efficient performance of blast furnace, the extent of reduction of Wustite should be _____

Options :

1. 50-60% indirect reduction

2. 100% indirect reduction

3. 100% direct reduction

4. 50-60% direct reduction

Question Number : 150 Question Id : 8946584558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the acid Bessemer steel process, the hot metal should have the following composition

(Where S is Sulphur and P is Phosphorus)

Options :

1. $S < 0.05\%$ and $P < 1.5\%$

2. $S < 0.05\%$ and $P < 0.05\%$

3. $S < 0.05\%$ and $P > 1.5\%$

4. $S > 1.5\%$ and $P < 0.05\%$

Question Number : 151 Question Id : 8946584559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Pellets are not as popular in burden as sinter in the iron blast furnace because of their _____

Options :

1. Poor reducibility

2. Low mechanical strength

3. Swelling tendency

4. Shape

Question Number : 152 Question Id : 8946584560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following factors is not desirable for effective phosphorus removal in BOF steel making process?

Options :

1. Higher temperature

2. Lower temperature

3. Higher basicity

4. Higher FeO level in slag

Question Number : 153 Question Id : 8946584561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

_____ process is performed for inclusion modification in ladle metallurgy of steel making.

Options :

1. Oxygen top blowing

2. Oxygen bottom blowing

3. Aluminium wire injection

4. Calcium wire injection

Question Number : 154 Question Id : 8946584562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In steel making, the addition of bauxite is done to _____

Options :

1. improve Phosphorus distribution ratio

2. decrease viscosity of slag

3. increase the activity of FeO in slag

4. improve Sulphur distribution ratio

Question Number : 155 Question Id : 8946584563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following statements regarding Kroll's process is not correct?

Options :

1. Pure metal chlorides serve as raw material

2. Reduction chamber should be free of oxygen

3. Useful for the extraction of Ti and Zr

4. Reduction is done by Al

Question Number : 156 Question Id : 8946584564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the metals listed in Group A with the process in Group B and find the correct answer

Group A	Group B
a. Nickel refining	I. Poling
b. Copper	II. Carbonyl process
c. Zinc	III. Rotary kiln process
d. Iron sponge	IV. Distillation

Options :

1. a-I, b-II, c-III, d-IV

2. a-II, b-I, c-IV, d-III

3. a-IV, b-II, c-I, d-III

4. a-III, b-IV, c-II, d-I

Question Number : 157 Question Id : 8946584565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A conventional copper converter is blown from _____

Options :

1. top

2. bottom

3. side

4. top and bottom

Question Number : 158 Question Id : 8946584566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. Carbon

2. Ferrosilicon

3. Silicon

4. Sodium

Question Number : 159 Question Id : 8946584567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Al_2O_3 content of cryolite in Hall-Heroult's cell is maintained between _____.

Options :

1. 6 – 12 %

2. 18 – 20 %

3. 2 – 5 %

4. 12 – 15 %

Question Number : 160 Question Id : 8946584568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In imperial smelting process for extraction of zinc, zinc vapor is quenched in the external condenser by _____

Options :

1. Jet of water

2. Blast of air

3. Mix of water and air

4. Molten lead

Question Number : 161 Question Id : 8946584569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Monazite deposits constitute an important source for _____.

Options :

1. Titanium

2. Thorium

3. Molybdenum

4. Niobium

Question Number : 162 Question Id : 8946584570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Copper can be reduced from copper sulphate solution by _____.

Options :

1. Iron

2. Silver

3. Lead

4. Carbon

Question Number : 163 Question Id : 8946584571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Penetrameter	I. Ultrasonic test
b. Differential coil probe	II. Dye-penetrant test
c. Piezo-electric probe	III. X-ray radiography
d. Developer	IV. Acoustic emission test

Options :

1. a-III, b-IV, c-I, d-II

2. a-II, b-I, c-III, d-IV

3. a-I, b-II, c-IV, d-III

4. a-IV, b-III, c-II, d-I

Question Number : 164 Question Id : 8946584572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Subsurface defects and its location can be found by the following test _____

Options :

1. Ultrasonic pulse echo

2. Penetrant

3. Eddy current

4. Magnetic particle

Question Number : 165 Question Id : 8946584573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Generally brittle materials have % of elongation below _____.

Options :

1. 5

2. 10

3. 20

4. 40

Question Number : 166 Question Id : 8946584574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Tensile	I. Barreling
b. Compressive	II. Intergranular cracking
c. Fatigue	III. Striations
d. Creep	IV. Cup and cone
	V. Earing

Options :

1. a-IV, b-V, c-III, d-I

2. a-IV, b-I, c-III, d-II

3. a-V, b-I, c-IV, d-II

4. a-III, b-II, c-I, d-IV

Question Number : 167 Question Id : 8946584575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which test is commonly used to understand high temperature deformation behavior of materials?

Options :

1. Impact

2. Fatigue

3. Creep

4. Compression

Question Number : 168 Question Id : 8946584576 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Fatigue resistance of a steel is reduced by _____.

Options :

1. Decarburization

2. Polishing of surface

3. Fine grain size

4. Shot peening

Question Number : 169 Question Id : 8946584577 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Low cycle fatigue	I. Charpy test
b. Creep	II. Portevin-Le Chatlier effect
c. Impact toughness	III. Coffin-Manson equation
d. Stretcher strain	IV. Larson-Miller parameter
	V. Jominy end Quench test

Options :

1. a-II, b-IV, c-I, d-V

2. a-II, b-I, c-V, d-III

3. a-III, b-IV, c-I, d-II

4. a-III, b-I, c-IV, d-V

Question Number : 170 Question Id : 8946584578 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The fracture toughness of lower strength ductile material is best measured by _____.

Options :

1. J–integral method

2. K_{IC} evaluation

3. Impact test

4. Flexural test

Question Number : 171 Question Id : 8946584579 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Tungsten filament for lamp is commonly produced by _____.

Options :

1. Powder metallurgy and metal forming

2. Powder metallurgy and welding

3. Casting and metal forming

4. Casting and welding

Question Number : 172 Question Id : 8946584580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Drawing	I. Large curved disc
b. Forging	II. Tube
c. Rolling	III. Crank shaft
d. Stretch forming	IV. Plate

Options :

1. a-II, b-III, c-IV, d-I
2. a-I, b-IV, c-III, d-II
3. a-III, b-II, c-I, d-IV
4. a-IV, b-I, c-II, d-III

Question Number : 173 Question Id : 8946584581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In metal forming, hot working and cold working is defined based on _____.

Options :

1. Solidus temperature
2. Recrystallization temperature
3. Transformation temperature
4. Eutectic temperature

Question Number : 174 Question Id : 8946584582 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Thin foils of aluminium is produced by _____

Options :

1. 2-High roll mill

2. 4-High roll mill

3. Planetary mill

4. Cluster/Sendzimir mill

Question Number : 175 Question Id : 8946584583 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In sheet metal forming, stretcher strains occur in _____.

Options :

1. Low carbon steel

2. Duralumin

3. Austenitic stainless steels

4. Ni-base alloy

Question Number : 176 Question Id : 8946584584 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The respective units for dislocation density and stress intensity factor are _____.

Options :

1. m^2 and MPa.m

2. m^2 and $MPa.m^{1/2}$

3. m^{-2} and $MPa.m^{1/2}$

4. m^{-2} and MPa.m

Question Number : 177 Question Id : 8946584585 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Number of slip systems in close packed hexagonal metal is_____.

Options :

1. 3

2. 12

3. 24

4. 48

Question Number : 178 Question Id : 8946584586 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A defect that is bounded by two mirror planes is_____.

Options :

1. Stacking fault

2. Grain boundary

3. Edge dislocation

4. Twin

Question Number : 179 Question Id : 8946584587 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Forging	I. Alligator
b. Rolling	II. Cold shut
c. Deep drawing	III. Chevron cracks
d. Extrusion	IV. Wrinkles

Options :

1. a-I, b-II, c-III, d-IV

2. a-II, b-I, c-III, d-IV

3. a-I, b-II, c-IV, d-III

4. a -IV, b-III, c-II, d-I

Question Number : 180 Question Id : 8946584588 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Movement of jogs can produce _____.

Options :

1. Vacancies

2. Grain boundary sliding

3. Screw dislocation

4. Twin

Question Number : 181 Question Id : 8946584589 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Low melting point metals/alloys are generally casted by _____

Options :

1. Sand casting

2. Investment casting

3. Die casting

4. Centrifugal casting

Question Number : 182 Question Id : 8946584590 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Hot tear	I. Insufficient melt super heat
b. Misrun	II. High residual stresses
c. Blister	III. Improper venting
d. Rat tail	IV. Expansion of sand

Options :

1. a-I, b-II, c-III, d-IV

2. a-III, b-IV, c-I, d-II

3. a-IV, b-III, c-II, d-I

4. a-II, b-I, c-III, d-IV

Question Number : 183 Question Id : 8946584591 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Riser is not required for the casting of _____

Options :

1. White cast iron

2. Grey cast iron

3. Al alloys

4. Steel

Question Number : 184 Question Id : 8946584592 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a sound casting, the last liquid to solidify is in the _____.

Options :

1. Riser

2. Gate

3. Runner

4. Vent

Question Number : 185 Question Id : 8946584593 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Draft allowance is given to patterns for _____

Options :

1. Compensating liquid state shrinkage

2. Easy removal of pattern from the mould

3. Providing support for core

4. Compensating solid state shrinkage

Question Number : 186 Question Id : 8946584594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Macro-segregation	I. Inoculation
b. Fine grained structure	II. Gas evolution and shrinkage
c. Porosity	III. Temperature gradient and super cooling
d. Dendrites	IV. Density difference and convection currents

Options :

1. a-I, b-III, c-II, d-IV

2. a-IV, b-I, c-II, d-III

3. a-II, b-IV, c-I, d-III

4. a-IV, b-I, c-III, d-II

Question Number : 187 Question Id : 8946584595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which casting technique is used for obtaining close dimensional accuracy?

Options :

1. Centrifugal casting

2. Sand casting

3. Die casting

4. Investment casting

Question Number : 188 Question Id : 8946584596 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Mould coating material that helps in grain refinement of metal casting is _____.

Options :

1. Cobalt aluminide

2. Zinc

3. Tellurium

4. Boron

Question Number : 189 Question Id : 8946584597 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For casting of cast iron, generally melting is done by using _____.

Options :

1. Cupola

2. Muffle furnace

3. Blast furnace

4. Convertor

Question Number : 190 Question Id : 8946584598 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Directional solidification is preferred for applications such as _____.

Options :

1. Engine blocks

2. Connecting rods

3. Permanent magnets

4. Gears

Question Number : 191 Question Id : 8946584599 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a brazing process, the liquid metal fills the gap by _____ infiltration

Options :

1. Capillary

2. Gravity

3. Pressure

4. Vacuum

Question Number : 192 Question Id : 8946584600 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The nature of submerged arc welding flux with basicity index of 0.5 is_____

Options :

1. Neutral

2. Acidic

3. Basic

4. Semi basic

Question Number : 193 Question Id : 8946584601 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is not a solid state welding process?

Options :

1. Friction stir welding

2. Ultrasonic welding

3. Flux cored arc welding

4. Explosive welding

Question Number : 194 Question Id : 8946584602 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

How much carbon equivalent in steel is considered to be good for weldability?

Options :

1. 1.0

2. 0.8

3. 0.6

4. 0.4

Question Number : 195 Question Id : 8946584603 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The weld structure of a metal has similarity to that of the metal produced via _____.

Options :

1. Casting

2. Powder metallurgy

3. Rolling

4. Forging

Question Number : 196 Question Id : 8946584604 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Ultrasonic welding	I. Thermochemical
b. Spot welding	II. Electrical resistance
c. SMAW	III. Friction
d. Thermit welding	IV. Electrical arc

Options :

1. a-III, b-II, c-I, d-IV

2. a-IV, b-III, c-II, d-I

3. a-I, b-III, c-IV, d-II

4. a-III, b-II, c-IV, d-I

Question Number : 197 Question Id : 8946584605 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Weld decay in austenitic stainless steels can be avoided by _____.

Options :

1. Reducing carbon content

2. Increasing carbon content

3. Eliminating strong carbide formers

4. Decreasing chromium content

Question Number : 198 Question Id : 8946584606 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Non consumable electrode is used in _____ process.

Options :

1. Gas metal arc welding

2. Gas tungsten arc welding

3. Submerged arc welding

4. Laser welding

Question Number : 199 Question Id : 8946584607 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Match the list in Group A with Group B and find the correct answer

Group A	Group B
a. Soldering	I. Silver-Titanium alloy
b. Welding	II. Silver-Tin alloy
c. Brazing	III. Mild steel
	IV. Lead flouride

Options :

1. a-II, b-III, c-I

2. a-I, b-II, c-III

3. a-III, b-I, c-IV

4. a-II, b-IV, c-I

Question Number : 200 Question Id : 8946584608 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which region of weld does undergo heat treatment effect?

Options :

1. Base metal
2. Weld metal
3. HAZ
4. Centre of the weld