

Question Paper Preview

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 12th May
2025 Shift1

Subject Name :

Metallurgical Engineering

Creation Date :

2025-05-12 13:25:58

Duration :

180

Total Marks :

200

Display Marks:

No

Share Answer Key With Delivery Engine :

Yes

Actual Answer Key :

Yes

Change Font Color :

No

Change Background Color :

No

Change Theme :

No

Help Button :

No

Show Reports :

No

Show Progress Bar :

No

METALLURGICAL ENGINEERING

Group Number :

1

Group Id :

50696134

Group Maximum Duration :

0

Group Minimum Duration :

180

Show Attended Group? :

No

Edit Attended Group? :

No

Break time :

0

Group Marks :

200

Mathematics

Section Id :

506961130

Section Number :

1

Section type :

Online

Mandatory or Optional :

Mandatory

Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	50
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	506961151
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 5069616616 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ and if $(aI + bA)^2 = A$, then $b^4 =$

Options :

1. ✖ 1

2. ✖ $\frac{1}{2}$

3. ✖ $-\frac{1}{4}$

4. ✔ $\frac{1}{4}$

Question Number : 2 Question Id : 5069616617 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{pmatrix} \cos \theta & \sin \theta & 0 \\ -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{pmatrix} = F(\theta)$, then $A^{-1} =$

Options :

1. ✖ $F(\theta)$

2. ✓ $F(-\theta)$

3. ✗ $-F(\theta)$

4. ✗ $-F(-\theta)$

Question Number : 3 Question Id : 5069616618 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If (x, y, z) is the solution of linear equations $x + y + z = 6$,

$$x - y + z = 2, 2x + y - z = 1, \text{ then } \frac{yz}{x} =$$

Options :

1. ✗ $\frac{1}{6}$

2. ✗ $\frac{3}{2}$

3. ✓ 6

4. ✗ 3

Question Number : 4 Question Id : 5069616619 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If A and B are square matrices of order 3 with $|A| = 2, |B| = -4$, then

$$|2AB| =$$

Options :

1. ✓ -64

2. ✖ 16

3. ✖ 64

4. ✖ -16

Question Number : 5 Question Id : 5069616620 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $\log_{\sqrt{27}}(x) = \frac{8}{3}$, then $x =$

Options :

1. ✖ 10

2. ✖ 16

3. ✔ 81

4. ✖ 27

Question Number : 6 Question Id : 5069616621 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $\frac{x^3}{(x-1)(x+2)} = Ax + B + \frac{C}{x-1} + \frac{D}{x+2}$, then $C + D =$

Options :

1. ✖ -3

2. ✔ 3

3. ✖ 2

4. ✖ 0

Question Number : 7 Question Id : 5069616622 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{\sin^2 33^\circ - \sin^2 57^\circ}{\sin 21^\circ - \cos 21^\circ} =$$

Options :

1. ✖ $\frac{\sqrt{3}}{2}$

2. ✖ $\frac{1}{2}$

3. ✔ $\frac{1}{\sqrt{2}}$

4. ✖ 1

Question Number : 8 Question Id : 5069616623 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $A + B = \frac{\pi}{3}$ and $\cos A + \cos B = 1$, then $3\cos(A - B) =$

Options :

1. ✔ -1

2. ✖

2

3. ✖ -2

4. ✖ 1

Question Number : 9 Question Id : 5069616624 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $2 \tan^{-1} \left(\frac{2}{3} \right) = \tan^{-1}(k)$, then $k =$

Options :

1. ✖ $\frac{5}{12}$ 2. ✖ $\frac{4}{3}$ 3. ✔ $\frac{12}{5}$ 4. ✖ $\frac{3}{4}$

Question Number : 10 Question Id : 5069616625 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\tan^{-1} \left(\frac{1-x}{1+x} \right) = \frac{1}{2} \tan^{-1}(x)$, $x > 0$, then $x =$

Options :

1. ✖

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

2. ✓ $\frac{1}{\sqrt{3}}$

3. ✗ $\frac{1}{2}$

4. ✗ 1

Question Number : 11 Question Id : 5069616626 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\cosh x = \frac{3}{2}$, then $\cosh 2x =$

Options :

1. ✗ $\frac{1}{3}$

2. ✓ $\frac{7}{2}$

3. ✗ $\frac{5}{2}$

4. ✗ $\frac{11}{3}$

Question Number : 12 Question Id : 5069616627 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\left(\frac{\sqrt{3}+i}{2}\right)^6 + \left(\frac{\sqrt{3}-i}{2}\right)^6 =$$

Options :

1. ✖ 3

2. ✖ -3

3. ✖ 2

4. ✔ -2

Question Number : 13 Question Id : 5069616628 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The distance between the lines $y = 2x + 4$ and $6x - 3y = 5$ is (in units)

Options :

1. ✖ $\frac{13}{2\sqrt{5}}$

2. ✔ $\frac{17}{3\sqrt{5}}$

3. ✖ $\frac{17}{2\sqrt{5}}$

4. ✖ $\frac{14}{3\sqrt{5}}$

Question Number : 14 Question Id : 5069616629 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If the radius of the circle $x^2 + y^2 - 4x + 6y - k = 0$ is 4, then $k =$

Options :

1. ✓ 3

2. ✗ -3

3. ✗ 2

4. ✗ $\frac{1}{2}$

Question Number : 15 Question Id : 5069616630 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If the angle between the lines $3x - 4y + 1 = 0$ and $ax + by - 7 = 0$ is 90° , then $3a - 4b =$

Options :

1. ✗ 12

2. ✗ -1

3. ✓ 0

4. ✗

7

Question Number : 16 Question Id : 5069616631 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation of the tangent to the circle $x^2 + y^2 - 6x + 4y - 12 = 0$ at $(-1,1)$ is

Options :

1. ✖ $4x + 3y + 1 = 0$

2. ✖ $2x - 3y + 5 = 0$

3. ✖ $2x + 3y - 1 = 0$

4. ✔ $4x - 3y + 7 = 0$

Question Number : 17 Question Id : 5069616632 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The eccentricity of the ellipse whose latus rectum is equal to half of its major axis is

Options :

1. ✖ $\sqrt{3}$

2. ✔ $\frac{1}{\sqrt{2}}$

3. ✖ $\sqrt{2}$

4. ✖ $\frac{1}{\sqrt{3}}$

Question Number : 18 Question Id : 5069616633 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \left(\sqrt{\sin(x^2)} \right) =$$

Options :

1. ✖ $\frac{x^2 \cos(x^2)}{\sqrt{\sin(x^2)}}$

2. ✖ $\frac{x \cos(x^2)}{2\sqrt{\sin(x^2)}}$

3. ✔ $\frac{x \cos(x^2)}{\sqrt{\sin(x^2)}}$

4. ✖ $\frac{x \sin(x^2)}{\sqrt{\cos(x^2)}}$

Question Number : 19 Question Id : 5069616634 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \tan^{-1} \left(\frac{\sin x}{1 + \cos x} \right) =$$

Options :

1. ✖ 2

2. ✖ 4

3. ✖ 1

4. ✔ $\frac{1}{2}$

Question Number : 20 Question Id : 5069616635 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $y^x = x^{\cos y}$, then $\frac{dy}{dx} =$

Options :

1. ✔ $\frac{y(\cos y - x \log y)}{x(x + y \sin y \log x)}$

2. ✖ $\frac{y(\cos y + x \log y)}{x(x + y \sin y \log x)}$

3. ✖ $\frac{y(\cos y - x \log y)}{x(x - y \sin y \log x)}$

4. ✖ $\frac{(\cos y - x \log y)}{(x + y \sin y \log x)}$

Question Number : 21 Question Id : 5069616636 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$$

Options :

1. ✖ $\frac{1}{6}$

2. ✖ $\frac{2}{3}$

3. ✖ $\frac{3}{4}$

4. ✔ $\frac{5}{7}$

Question Number : 22 Question Id : 5069616637 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation of the normal to the curve $y = x^3 - 3x$ at the point P(2, 2) is

Options :

1. ✖ $x + 9y - 2 = 0$

2. ✖ $x + 9y - 22 = 0$

3. ✔ $x + 9y - 20 = 0$

4. ✖ $x + 9y - 12 = 0$

Question Number : 23 Question Id : 5069616638 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The maximum value of $y = (x - 1)^2 e^x$ is

Options :

1. ✓ $\frac{4}{e}$

2. ✗ $\frac{2}{e}$

3. ✗ $\frac{1}{e}$

4. ✗ $\frac{9}{e}$

Question Number : 24 Question Id : 5069616639 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $f(x, y) = (x + y)e^{xy}$, then at P(2,2) the value of $\frac{\partial f}{\partial x} =$

Options :

1. ✗ $8e^4$

2. ✗ $4e^4$

3. ✓ $9e^4$

4. ✗ $16e^4$

Question Number : 25 Question Id : 5069616640 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

If $u(x, y) = \sin^{-1}\left(\frac{x^4 + y^4}{x^2 + y^2}\right)$, then $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} =$

Options :

1. ✖ $2 \cot u$

2. ✔ $2 \tan u$

3. ✖ $2 \sin u$

4. ✖ $2 \cos u$

Question Number : 26 Question Id : 5069616641 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$\int \frac{1}{(1 - \cos x)} dx =$

Options :

1. ✔ $-\cot x - \operatorname{cosec} x + c$

2. ✖ $-\cot x + \operatorname{cosec} x + c$

3. ✖ $\cot x - \operatorname{cosec} x + c$

4. ✖ $-\tan x - \sec x + c$

Question Number : 27 Question Id : 5069616642 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_2^4 f(x) dx =$$

Options :

1. ✖ $\int_2^4 f(6+x) dx$

2. ✖ $\int_2^4 f(4-x) dx$

3. ✖ $\int_2^4 f(2-x) dx$

4. ✔ $\int_2^4 f(6-x) dx$

Question Number : 28 Question Id : 5069616643 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_{-1}^1 \sin \pi x dx =$$

Options :

1. ✖ $\frac{1}{\pi}$

2. ✖ $\frac{2}{\pi}$

3. ✓ 0

4. ✗ $-\frac{2}{\pi}$

Question Number : 29 Question Id : 5069616644 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\lim_{n \rightarrow \infty} \left[\frac{1}{n} + \frac{n^2}{(n+1)^3} + \frac{n^2}{(n+2)^3} + \dots + \frac{1}{8n} \right] =$$

Options :

1. ✗ $\frac{1}{8}$

2. ✗ $\frac{1}{4}$

3. ✓ $\frac{3}{8}$

4. ✗ $\frac{1}{2}$

Question Number : 30 Question Id : 5069616645 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The area of the region bounded by the lines $x = 1, x = 4, y = 4x$ and $y = x^2$ is

Options :

1. ✗ 2

2. ✖ 6

3. ✖ 16

4. ✔ 9

Question Number : 31 Question Id : 5069616646 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

According to Simpson's $\frac{1}{3}$ rule, the value of the integral $\int_1^3 \frac{1}{x} dx$ with $h = \frac{1}{2}$, is

Options :

1. ✖ 1.5

2. ✖ 0.5

3. ✔ 1.1

4. ✖ 2

Question Number : 32 Question Id : 5069616647 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The differential equation whose general solution is $y = Ax^2 + Bx$, where A and B are arbitrary constants is

Options :

1. ✖ $x^2 y'' + 2xy' - 2y = 0$

2. ✓ $x^2 y'' - 2xy' + 2y = 0$

3. ✗ $y'' - 2y' + 2y = 0$

4. ✗ $x^2 y'' - 2xy' - 2y = 0$

Question Number : 33 Question Id : 5069616648 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation
 $(e^x + 1)y \, dy + (y + 1) \, dx = 0$ is

Options :

1. ✗ $e^{x-y} = c(y + 1)(1 - e^x)$

2. ✓ $e^{x+y} = c(y + 1)(1 + e^x)$

3. ✗ $e^{2x-y} = c(y + 1)(1 - e^x)$

4. ✗ $e^{x+y} = cy(1 + e^x)$

Question Number : 34 Question Id : 5069616649 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If the differential equation $(x^2 + y^2)dx + kxy \, dy = 0$ is exact, then k =

Options :

1. ✓ 2

2. ✖ 1

3. ✖ -1

4. ✖ -2

Question Number : 35 Question Id : 5069616650 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation $\frac{dy}{dx} + y \tan x = \cos^2 x$ is

Options :

1. ✖ $y \cot x = \tan x + c$

2. ✖ $y \sec x = x \sin x + c$

3. ✖ $x \sec x = \sin x + c$

4. ✔ $y \sec x = \sin x + c$

Question Number : 36 Question Id : 5069616651 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The integrating factor of the differential equation $\frac{dy}{dx} + \frac{2x}{x^2+1} y = x^2 + 1$ is

Options :

1. ✖ $2x$

2. ✖ $x^2 + 2$

3. ✔ $x^2 + 1$

4. ✖ $x^2 - 1$

Question Number : 37 Question Id : 5069616652 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation $6y'' - 5y' - 6y = 0$ is

Options :

1. ✖ $y = ae^{9x} + be^{4x}$

2. ✖ $y = ae^{-9x} + be^{-4x}$

3. ✔ $y = ae^{\frac{3x}{2}} + be^{\frac{-2x}{3}}$

4. ✖ $y = ae^{\frac{-3x}{2}} + be^{\frac{-2x}{3}}$

Question Number : 38 Question Id : 5069616653 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation $(4D^2 + 4D - 3)y = e^{3x}$ is

(Here $D \equiv \frac{d}{dx}$)

Options :

1. ✖ $\frac{1}{11}e^{3x}$

2. ✓ $\frac{1}{45} e^{3x}$

3. ✗ $\frac{1}{5} e^{3x}$

4. ✗ $\frac{1}{3} e^{3x}$

Question Number : 39 Question Id : 5069616654 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation

$$(D^2 + 4)y = 5(\cos 3x + \sin 3x) \text{ is}$$

$$\left(\text{Here } D \equiv \frac{d}{dx} \right)$$

Options :

1. ✗ $\cos 3x + \sin 3x$

2. ✗ $\cos 3x - \sin 3x$

3. ✓ $-\cos 3x - \sin 3x$

4. ✗ $\sin 3x - \cos 3x$

Question Number : 40 Question Id : 5069616655 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $L\left\{\int_0^t \cosh 3u \, du\right\} = f(s)$, then $f(4) =$

Options :

1. ✓ $\frac{1}{7}$

2. ✗ $\frac{1}{32}$

3. ✗ 0

4. ✗ $\frac{7}{32}$

Question Number : 41 Question Id : 5069616656 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Let $F(t) = \begin{cases} e^{t-1}, & t > 1 \\ 0, & t < 1 \end{cases}$. If $s > 1$ then $L\{F(t)\} =$

Options :

1. ✗ $\frac{1}{s-1}$

2. ✗ $\frac{e^{-1}}{s-1}$

3. ✓ $\frac{e^{-s}}{s-1}$

4. ✗

$$\frac{e^s}{s-1}$$

Question Number : 42 Question Id : 5069616657 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\infty} t e^{-t} \sin t \, dt =$$

Options :

1. ✖ -1

2. ✔ $\frac{1}{2}$

3. ✖ 0

4. ✖ 2

Question Number : 43 Question Id : 5069616658 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$L^{-1} \left\{ \frac{1}{s(s-1)} \right\} =$$

Options :

1. ✖ $1 - e^t$

2. ✖ $e^t + 1$

3. ✖

$$e^{-t} - 1$$

4. ✓ $e^t - 1$

Question Number : 44 Question Id : 5069616659 Question Type : MCQ Option Shuffling : Yes
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

If $L^{-1} \left\{ \frac{s+1}{s^2+2s+2} \right\} = e^{at} \cos bt$, then $a^2 + b^2 =$

Options :

1. ✓ 2

2. ✗ 4

3. ✗ 0

4. ✗ 8

Question Number : 45 Question Id : 5069616660 Question Type : MCQ Option Shuffling : Yes
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

The convolution of the functions 1 and $\sin t$ is

Options :

1. ✓ $1 - \cos t$

2. ✗ $1 - \sin t$

3. ✗

$\cos t$

4. ✖ $1 + \cos t$

Question Number : 46 Question Id : 5069616661 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the solution of the initial value problem

$y'' + 9y = 9u(t - 3), y(0) = 0, y'(0) = 0$ (Here $u(t - 3)$ is the unit step function) is

Options :

1. ✖ $\frac{9e^{3s}}{s(s^2 - 9)}$

2. ✖ $\frac{e^{-3s}}{s^2(s^2 + 9)}$

3. ✖ $\frac{9e^{-3s}}{(s^2 + 9)^2}$

4. ✔ $\frac{9e^{-3s}}{s(s^2 + 9)}$

Question Number : 47 Question Id : 5069616662 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

$$\int_{-\frac{\pi}{2}}^{\frac{3\pi}{2}} \cos^2 4x \, dx =$$

Options :

1. ✓ π

2. ✗ 3π

3. ✗ 2π

4. ✗ $\frac{\pi}{2}$

Question Number : 48 Question Id : 5069616663 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of a_3 in the Fourier series expansion of the function

$$f(x) = \begin{cases} 0, & -\pi < x \leq 0 \\ x, & 0 < x \leq \pi \end{cases}$$

Options :

1. ✗ $\frac{-2}{\pi}$

2. ✗ $\frac{-2}{3\pi}$

3. ✗ $\frac{-2}{5\pi}$

4. ✓ $\frac{-2}{9\pi}$

Question Number : 49 Question Id : 5069616664 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The value of b_1 in the Fourier series expansion of $f(x) = x \sin x$ in $0 \leq x \leq 2\pi$ is

Options :

1. ✓ π

2. ✗ 2π

3. ✗ 3π

4. ✗ 4π

Question Number : 50 Question Id : 5069616665 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The period of the function $f(x) = \sin\left(\frac{\pi x}{3}\right)$ is

Options :

1. ✗ π

2. ✗ $\frac{\pi}{3}$

3. ✖ $\frac{\pi}{6}$

4. ✔ 6

Physics

Section Id :	506961131
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	506961152
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 5069616666 Question Type : MCQ Option Shuffling : Yes
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

Velocity (v) of water waves depends on their Wavelength (λ), Density of Water (ρ) and acceleration due to gravity (g). By the method of dimensional analysis, the relation between these quantities is given by

Options :

1. ✖ v^2 is proportional to $(\rho\lambda g)$

2. ✖ v is proportional to $\lambda g/\sqrt{\rho}$

3. ✔ v^2 is proportional to (λg)

v is proportional to $(\rho\lambda g)$

4. ✖

Question Number : 52 Question Id : 5069616667 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Force $\vec{F} = 2\hat{i} + 3\hat{j} + 7\hat{k}$ newtons (N), acting on an object causes a displacement $\vec{S} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ meters (m). Then the work done is

Options :

1. ✖ 30 Nm

2. ✖ 40 Nm

3. ✔ 48 Nm

4. ✖ 25 Nm

Question Number : 53 Question Id : 5069616668 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\vec{A} = \hat{i} + 2\hat{j} + 3\hat{k}$ and $\vec{B} = 3\hat{i} + 2\hat{j} + \hat{k}$ are the adjacent sides of a parallelogram respectively. The area of the Parallelogram is

Options :

1. ✖ $8\sqrt{2}$

2. ✔ $8\sqrt{3}$

3. ✖ $3\sqrt{8}$

4. ✖ $\sqrt{8}$

Question Number : 54 Question Id : 5069616669 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A block is placed on a rough floor and a horizontal force 'F' is applied on it. The force of friction 'f' by the floor on the block is measured for different values of 'F'. The graph between the 'f' and 'F' would be

Options :

1. ✖ The graph is a straight line of slope 45° for all 'F'
2. ✖ The graph is a straight line parallel to 'F' axis for all 'F'
3. ✔ The graph is a straight line of slope 45° for small values of 'F' and straight line parallel to 'F' axis for large 'F'
4. ✖ The graph is exponential with values of 'F'

Question Number : 55 Question Id : 5069616670 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Throughout the flight of a particle in projectile motion

Options :

1. ✔ The horizontal component of velocity is constant
2. ✖ The vertical component of velocity is constant
3. ✖ The horizontal component of velocity decreases

The horizontal component of velocity is zero

4. ✖

Question Number : 56 Question Id : 5069616671 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A motor cyclist driving with a speed of 0.6 km/minute goes over a turn of radius of curvature 10 m. His slope with vertical in degrees (take $g = 10 \text{ m/sec}^2$).

Options :

1. ✖ 0°

2. ✖ 30°

3. ✔ 45°

4. ✖ 60°

Question Number : 57 Question Id : 5069616672 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two wires of lengths in the ratio 2:3 taken from same material and having the same mass are stretched by same force. Then their elongations are in the ratio of

Options :

1. ✖ 2:3

2. ✖ 3:2

3. ✖ 1:2

4. ✔

4:9

Question Number : 58 Question Id : 5069616673 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is wrong?

Options :

1. ✖ Surface Tension of a liquid decreases with increase of temperature
2. ✖ Surface Tension of a liquid increases or decreases depending on the type of impurities added to the liquid
3. ✔ Angle of Contact depends on the inclination of the solid rod placed in the liquid
4. ✖ A drop of oil placed on the surface of water will spread as a thin layer

Question Number : 59 Question Id : 5069616674 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A streamline flow is maintained across the two capillary tubes A and B connected in series. The length of B is twice that of A and the radius of B is half that of A. The pressure across A is P. The pressure across B is

Options :

1. ✖ 4P
2. ✖ 16P
3. ✔ 32P

4. ✖ P/32

Question Number : 60 Question Id : 5069616675 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A body of mass 0.1 kg is thrown vertically upward. At a certain point above the ground, the Potential energy and Kinetic energy of the body are 3.7 J and 6.3 J. The maximum height it reaches is ($g=10\text{m/s}^2$)

Options :

- 1. ✔ 10 m
- 2. ✖ 4 m
- 3. ✖ 100 m
- 4. ✖ 0.7 m

Question Number : 61 Question Id : 5069616676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two containers of volumes 20m^3 and 30m^3 have gases at Pressures of 40 MPa and 50 MPa. The two containers are connected by a very narrow pipe of negligible volume and the gases are allowed to intermingle. If the temperature remains constant, the final pressure in MPa is

Options :

- 1. ✔ 46
- 2. ✖ 40
- 3. ✖ 50
- 4. ✖

Question Number : 62 Question Id : 5069616677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

During an adiabatic process, a mono atomic gas at 27°C is compressed suddenly to $1/8$ of its original volume. Then the Final temperature in $^{\circ}\text{C}$ is (The ratio of the two specific heats of gases = $5/3$)

Options :

1. ✖ 1160

2. ✖ 887

3. ✔ 927

4. ✖ 88

Question Number : 63 Question Id : 5069616678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The time period of a simple pendulum is 3 sec. Its length is made 4 times. Then its time period is

Options :

1. ✖ 3 sec

2. ✖ 4 sec

3. ✔ 6 sec

4. ✖ 1.5 sec

Question Number : 64 Question Id : 5069616679 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particle executes Simple Harmonic Motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is

Options :

1. ✓ $8\pi/3$

2. ✗ $4\pi/3$

3. ✗ $3\pi/8$

4. ✗ $7\pi/3$

Question Number : 65 Question Id : 5069616680 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The two equations of Simple Harmonic Motions are $Y_1 = 12 \sin(50t + \pi/2)$ and $Y_2 = 12 \sin(50t + \pi/3)$. The phase difference between two motions is

Options :

1. ✗ $\pi/2$

2. ✗ $\pi/3$

3. ✓ $\pi/6$

4. ✗ $\pi/8$

Question Number : 66 Question Id : 5069616681 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Multiple reflections leading to persistence of sound in an auditorium are

Options :

1. ✖ beats
2. ✖ echo
3. ✔ reverberation
4. ✖ stationary waves

Question Number : 67 Question Id : 5069616682 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two sources S_1 and S_2 are moving with certain velocities. The apparent frequencies observed by a stationary observer are double and half of their original frequencies respectively. If the velocity of sound is v and velocity of wind is zero, then the velocities of two sources respectively are

Options :

1. ✖ $v/2$ and $2v$
2. ✖ v and $v/2$
3. ✖ $3v/2$ and $2v$
4. ✔ $v/2$ and v

Question Number : 68 Question Id : 5069616683 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Moment of couple acting on a bar magnet kept at an angle 30° to the direction of uniform magnetic field of induction 2 Tesla is equal to

Options :

1. ✖ Pole Strength of the Magnet
2. ✖ Length of the Magnet
3. ✖ Magnetic Flux
4. ✔ Magnetic Moment of the Magnet

Question Number : 69 Question Id : 5069616684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a Meter Bridge, R_1 and R_2 are the resistances connected in the left and right gaps respectively. The bridge is balanced at the balancing point of 60 cm from left. When a resistance of $30\ \Omega$ is connected in parallel to R_2 , the balancing point shifted to 90 cm. The values of R_1 and R_2 respectively are (in Ω)

Options :

1. ✖ 30 and 50
2. ✖ 200 and 350
3. ✔ 225 and 150
4. ✖ 100 and 75

Question Number : 70 Question Id : 5069616685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When 220 V AC is applied across a step-up transformer, it draws a current of 3A in the secondary. If the number of turns in the primary coil of the transformer is 100 and that of secondary coil is 2000. The output power of the transformer is

Options :

1. ✖ 8800 W
2. ✔ 13200 W
3. ✖ 4400 W
4. ✖ 2200 W

Question Number : 71 Question Id : 5069616686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A photon of frequency ν is incident on a photosensitive metal surface whose threshold frequency is ν_0 . The kinetic energy of emitted photo electron is

Options :

1. ✖ $h \cdot \nu$
2. ✖ $h \cdot \nu_0$
3. ✔ $h \cdot (\nu - \nu_0)$
4. ✖ $h \cdot (\nu + \nu_0)$

Question Number : 72 Question Id : 5069616687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In LASER, the condition of Population Inversion mean

Options :

1. ✖ The number of atoms in the lower energy state are more than the higher energy state
2. ✔ The number of atoms in the higher energy state are more than the lower energy state
3. ✖ The number of atoms in the lower and higher energy states are same
4. ✖ The number of atoms in higher energy state are zero

Question Number : 73 Question Id : 5069616688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a Graded Index Optical Fibre

Options :

1. ✖ The Refractive Index of the core remains constant and will be greater than that of the cladding
2. ✖ The Refractive Index of the core remains constant and will be less than that of the cladding
3. ✖ The Refractive Indices of both core and cladding remain constant and are equal
4. ✔ The Refractive Index of the core varies with maximum at the centre and decreases as the radial distance increases from the axis of the core

Question Number : 74 Question Id : 5069616689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is correct, if n_e and n_h are the concentrations of the Electrons and Holes respectively

Options :

1. ✓ In an intrinsic semiconductor, $n_e = n_h$ and both these charge carriers contribute to current equally
2. ✗ In p-type semiconductor, $n_e > n_h$ and the current due to electrons is more than that of holes
3. ✗ In n-type semiconductor, $n_p > n_e$ and current due to holes is more than that of electrons
4. ✗ In an extrinsic semiconductor, $n_e = n_h$ and both these charge carriers contribute to current equally

Question Number : 75 Question Id : 5069616690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The semiconductors used for fabrication of visible LEDs have band gap

Options :

1. ✗ Close to 1.5 eV
2. ✗ Close to 1.1 eV
3. ✗ About 1.0 eV to 1.6 eV
4. ✓ About 1.8 eV to 3 eV

Chemistry

Section Id :	506961132
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	506961153
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 5069616691 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

According to Aufbau principle, which orbital is filled immediately after each of the 3p, 4p, 4f and 5d?

Options :

1. ✖ 3d, 5s, 5d, 6p
2. ✖ 3d, 4d, 5d, 6p
3. ✔ 4s, 5s, 5d, 6p
4. ✖ 4s, 5s, 5d, 7s

Question Number : 77 Question Id : 5069616692 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following properties is not due to hydrogen bonding.

Options :

1. ✖

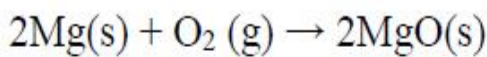
High boiling point of water

- 2. ✖ High viscosity of glycerol
- 3. ✖ Solubility of ammonia in water
- 4. ✔ Polar nature of halogen acid

Question Number : 78 Question Id : 5069616693 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0



In above reaction equation, the oxidation state of magnesium is changed from

Options :

- 1. ✔ 0 to +2
- 2. ✖ 0 to -2
- 3. ✖ +2 to -1
- 4. ✖ +2 to 0

Question Number : 79 Question Id : 5069616694 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

100 mL of ethanol, whose density is 1.2 g.mL^{-1} is diluted to 1.0 L by addition of distilled water. Molarity of the resultant solution is

Options :

1. ✖ 1.60

2. ✔ 2.60

3. ✖ 0.46

4. ✖ 2.90

Question Number : 80 Question Id : 5069616695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Among the below options, which is not a characteristic of a colloid

Options :

Particle size between $10 \text{ \AA} - 1000 \text{ \AA}$

1. ✖

Heterogeneous

2. ✖

Can be separable by filtration

3. ✔

Diffuse slowly

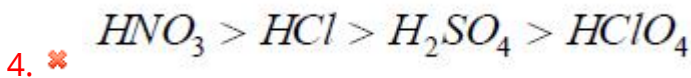
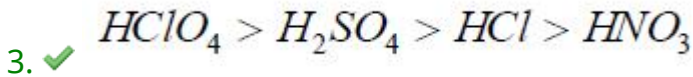
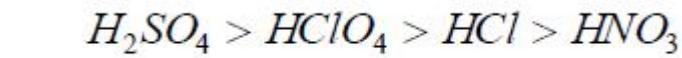
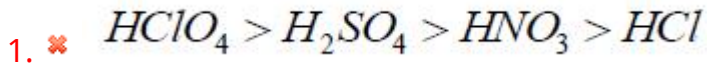
4. ✖

Question Number : 81 Question Id : 5069616696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct order of decreasing strength of acids is

Options :



Question Number : 82 Question Id : 5069616697 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution which can resist change in its pH on the addition of an acid or a base is known as

Options :

1. ✖ Isotonic solution

2. ✖ Colloidal solution

3. ✖ Neutral solution

4. ✔ Buffer solution

Question Number : 83 Question Id : 5069616698 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The minimum level of a pollutant above which a healthy individual worker is adversely affected on exposure to it for eight hours in a day is called

Options :

1. ✖ Critical Limit Value
2. ✖ Toxic Limit Value
3. ✔ Threshold Limit Value
4. ✖ Dangerous Limit Value

Question Number : 84 Question Id : 5069616699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The consequences of global warming are:

- (A) Increase in average temperature of the earth
- (B) Melting of Himalayan glaciers
- (C) Increased Biochemical Oxygen Demand of natural water
- (D) Eutrophication of water bodies

Choose the correct option.

Options :

1. ✖ A, D
2. ✖ A, C
3. ✔ A, B
4. ✖ A, B, C

Question Number : 85 Question Id : 5069616700 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The chemicals used for defluoridation of water by Nalgonda Technique are

Options :

1. ✖ CaO and CaOCl_2
2. ✔ Alum, CaO and CaOCl_2
3. ✖ CaH_2 , NaOCl and Alum
4. ✖ NaOCl, NaH and Alum

Question Number : 86 Question Id : 5069616701 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process which removes non-ionic, ionic, colloidal and organic matter in water is

Options :

1. ✖ Ion exchange process
2. ✖ Lime soda process
3. ✔ Reverse osmosis process
4. ✖ Zeolite process

Question Number : 87 Question Id : 5069616702 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The set of products that are formed during electrolysis of aqueous solution of KCl between platinum electrodes is

Options :

1. ✖ HCl and KOH
2. ✖ KOH and Cl₂
3. ✔ KOH, Cl₂ and H₂
4. ✖ K and Cl₂

Question Number : 88 Question Id : 5069616703 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When same quantity of electricity is passed through aqueous AgNO₃ and H₂SO₄ solutions connected in series, 5.04×10^{-2} g of H₂ is liberated. What is the mass of silver (in grams) deposited?
(Eq. Wt. of hydrogen and silver is 1.008 and 108 respectively)

Options :

1. ✖ 54
2. ✖ 0.54
3. ✔ 5.4
4. ✖ 10.8

Question Number : 89 Question Id : 5069616704 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Choose the correct option that differentiates metals from non-metals

Options :

Metals form acidic oxides, whereas non-metals form basic oxides.

1. ✖

Metals have a tendency to gain electrons, whereas non-metals have a tendency to lose electrons.

2. ✖

Metals are generally good conductors of electricity, whereas non-metals are insulators.

3. ✔

All metals exist in a solid state at room temperature.

4. ✖

Question Number : 90 Question Id : 5069616705 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Nichrome is commonly used in heating elements because

Options :

It has high electrical conductivity

1. ✖

It has a high melting point and corrosion resistance

2. ✔

It is lightweight

3. ✖

It is brittle and hard

4. ✖

Question Number : 91 Question Id : 5069616706 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ combinations is used for prevention of corrosion.

Options :

1. ✓ ☒ Phosphorous or Antimony
2. ✗ ☐ Phosphorous or Chlorine
3. ✗ ☐ Antimony or Nitrogen
4. ✗ ☐ Antimony or Sodium

Question Number : 92 Question Id : 5069616707 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process of coating zinc metal over iron to improve corrosion resistance of iron is called

Options :

1. ✗ ☐ Electroplating
2. ✗ ☐ Annealing
3. ✓ ☒ Galvanizing
4. ✗ ☐ Tinning

Question Number : 93 Question Id : 5069616708 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ is a cross linked polymer.

Options :

1. ✓ Bakelite
2. ✗ LDPE
3. ✗ Polystyrene
4. ✗ PVC

Question Number : 94 Question Id : 5069616709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the Biodegradable polymers from the following and choose the correct option.

(I) PVC (II) PHBV (III) Polypropylene (IV) Nylon-2-nylon-6

Options :

1. ✗ I and II
2. ✓ II and IV
3. ✗ I and IV
4. ✗ I, II and III

Question Number : 95 Question Id : 5069616710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Calculate the amount of oxygen required for the complete combustion of 1 mole of Methane (CH_4).

Options :

1. ✖ 1 mole
2. ✔ 2 moles
3. ✖ 3 moles
4. ✖ 4 moles

Question Number : 96 Question Id : 5069616711 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ represents the composition of water gas

Options :

1. ✔ $\text{CO} + \text{H}_2$
2. ✖ $\text{CO}_2 + \text{H}_2$
3. ✖ $\text{CO} + \text{CH}_4$
4. ✖ $\text{CO}_2 + \text{CH}_4$

Question Number : 97 Question Id : 5069616712 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following and choose the correct option.

List – I

List – II

- | | |
|--------------------------------|--|
| a) Hydrogen electrode | (i) $\text{Pt} \mid \text{Fe}^{3+}, \text{Fe}^{2+}$ |
| b) Standard hydrogen electrode | (ii) $\text{Fe} \mid \text{Fe}^{2+}$ |
| c) Metal-metal ion electrode | (iii) pH measurement |
| d) Glass electrode | (iv) $\text{Pt}, \text{H}_2 (2 \text{ bar}) \mid \text{H}^+ (0.1\text{M})$ |
| | (v) $\text{Pt}, \text{H}_2 (1 \text{ bar}) \mid \text{H}^+ (1.0\text{M})$ |
| | (vi) Oxidation electrode |

Options :

1. ✖ a – iii, b – v, c – i, d – vi

2. ✖ a – v, b – iv, c – ii, d – iii

3. ✖ a – v, b – iii, c – i, d – vi

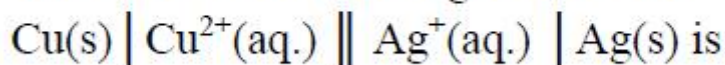
4. ✔ a – iv, b – v, c – ii, d – iii

Question Number : 98 Question Id : 5069616713 Question Type : MCQ Option Shuffling : Yes

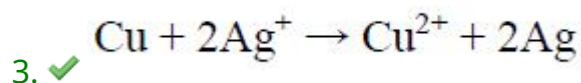
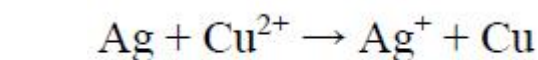
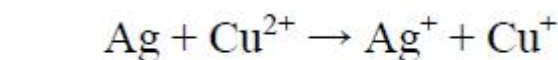
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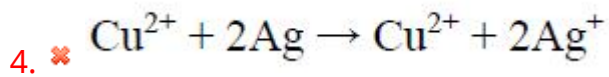
Correct Marks : 1 Wrong Marks : 0

The cell reaction of the galvanic cell



Options :





Question Number : 99 Question Id : 5069616714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

_____ is used to reduce water pollution.

Options :

1. ✖ Neem
2. ✖ Watermelon
3. ✔ Water hyacinth
4. ✖ People

Question Number : 100 Question Id : 5069616715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following can cause soil pollution

Options :

1. ✔ DDT
2. ✖ CO_2
3. ✖ NO_2
4. ✖ Nitrogen

METALLURGICAL ENGINEERING

Section Id :	506961133
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	506961154
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 5069616716 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The processing of raw minerals to yield marketable products and waste that do not destroy the physical and chemical identity of the minerals is regarded as

Options :

1. ✓ Mineral Dressing
2. ✗ Hydrometallurgy
3. ✗ Pyrometallurgy
4. ✗ Refining

Question Number : 102 Question Id : 5069616717 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The separation of a material into products characterised by difference in size is

Options :

- 1. ✖ Comminution
- 2. ✔ Sizing
- 3. ✖ Crushing
- 4. ✖ Grinding

Question Number : 103 Question Id : 5069616718 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is an example of fine crushing?

Options :

- 1. ✖ Jaw crusher
- 2. ✖ Gyratory crusher
- 3. ✖ Cone crusher
- 4. ✔ Gravity stamp mill

Question Number : 104 Question Id : 5069616719 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In mineral processing _____ method uses the difference in surface properties for separation of minerals.

Options :

1. ✓ Froth Flotation
2. ✗ Gravity concentration
3. ✗ Magnetic separation
4. ✗ Electrostatic separation

Question Number : 105 Question Id : 5069616720 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The energy required for reduction of particle size should be directly proportional to the new surface formed is known as

Options :

1. ✗ Bond's Law
2. ✗ Fick's law
3. ✗ Kick's law
4. ✓ Rittinger's law

Question Number : 106 Question Id : 5069616721 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is considered as lowest rank coal?

Options :

1. ✓ Lignite
2. ✗ Anthracite
3. ✗ Peat
4. ✗ Bituminous

Question Number : 107 Question Id : 5069616722 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following refractory is not classified as basic?

Options :

1. ✗ Fosterite
2. ✗ Magnesite
3. ✓ Fireclay
4. ✗ Dolomite

Question Number : 108 Question Id : 5069616723 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Ultimate analysis of coal is used to determine

Options :

1. ☒ Percentage of carbon and hydrogen
2. ☐ Percentage of moisture
3. ☐ Percentage of ash
4. ☐ Percentage of volatile matter

Question Number : 109 Question Id : 5069616724 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Coke is preferred to coal in the metallurgical process because of

Options :

1. ☐ Low strength and low porosity
2. ☒ High strength and high porosity
3. ☐ High strength and low porosity
4. ☐ Low strength and high porosity

Question Number : 110 Question Id : 5069616725 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Junkers calorimeter is used to determine the calorific value of

Options :

1. ✖ Coke
2. ✖ Solid fuel
3. ✖ Liquid fuel
4. ✔ Gaseous fuel

Question Number : 111 Question Id : 5069616726 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The standard free energy change ΔG_{298}^0 of any material can be obtained from

Options :

1. ✖ $\Delta G^0 = \Delta H^0 + T \Delta S^0$
2. ✖ $\Delta G^0 = \Delta S^0 + T \Delta H^0$
3. ✔ $\Delta G^0 = \Delta H^0 - T \Delta S^0$
4. ✖ $\Delta G^0 = \Delta S^0 - T \Delta H^0$

Question Number : 112 Question Id : 5069616727 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Faraday constant is equal to

Options :

1 Volt

1. ✖

1 Ampere

2. ✖

96,480 Coulombs / g. equivalent

3. ✔

9,650 Coulombs / g. equivalent

4. ✖

Question Number : 113 Question Id : 5069616728 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Find the wrong statement: Ellingham diagrams provide the information about

Options :

Feasibility of a reaction

1. ✖

Tedious calculations of thermodynamics

2. ✔

CO/CO₂ ratio in the reaction

3. ✖

H₂/H₂O ratio in the reaction

4. ✖

Question Number : 114 Question Id : 5069616729 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Heat of formation of an element in its standard state is

Options :

1. ✓ 0

2. ✗ < 0

3. ✗ > 0

4. ✗ A function of pressure

Question Number : 115 Question Id : 5069616730 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a reversible process

Options :

1. ✓ $TdS = dE + dW$

2. ✗ $dE - dW = TdS$

3. ✗ $dW - dE = TdS$

4. ✗ $TdS - dW + dE < 0$

Question Number : 116 Question Id : 5069616731 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

“When a gas is expanded from high pressure region to low pressure region, temperature change occurs”. This phenomenon is related with

Options :

Gibbs – Duhem equation

1. ✖

Gibbs – Helmholtz equation

2. ✖

Third law of thermodynamics

3. ✖

Joul – Thomson effect

4. ✔

Question Number : 117 Question Id : 5069616732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The formation of solid solutions are governed by

Options :

Hume-Rothery rule

1. ✔

Lever rule

2. ✖

Gibb’s Phase rule

3. ✖

Chvorinov’s rule

4. ✖

Question Number : 118 Question Id : 5069616733 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In which of the following reaction, a liquid solidifies to form two solid solutions.

Options :

- 1. ✓ Eutectic
- 2. ✗ Peritectic
- 3. ✗ Eutectoid
- 4. ✗ Peritectoid

Question Number : 119 Question Id : 5069616734 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The microstructure of eutectoid steel that is slowly cooled through the eutectoid temperature consisting of alternating layers of ferrite and cementite is called

Options :

- 1. ✗ Bainite
- 2. ✗ Martensite
- 3. ✓ Pearlite
- 4. ✗ Ledeburite

Question Number : 120 Question Id : 5069616735 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For binary systems the following are the variables

Options :

1. ✖ Temperature and Pressure
2. ✔ Temperature and Composition
3. ✖ Pressure and Composition
4. ✖ Temperature and Time

Question Number : 121 Question Id : 5069616736 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

An example of an isomorphous system is

Options :

1. ✔ Copper-Nickel
2. ✖ Aluminum-Copper
3. ✖ Lead-Tin
4. ✖ Copper-Tin

Question Number : 122 Question Id : 5069616737 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The crystal structure of cementite is

Options :

- 1. ✖ Body centered cubic
- 2. ✖ Hexagonal closed packed
- 3. ✔ Orthorhombic
- 4. ✖ Face centered cubic

Question Number : 123 Question Id : 5069616738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The line separating the single-phase region and the two-phase region is known as the

Options :

- 1. ✖ Solidus line
- 2. ✔ Solvus line
- 3. ✖ Liquidus line
- 4. ✖ Tie line

Question Number : 124 Question Id : 5069616739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the degree of freedom at the invariant point in a phase diagram

Options :

- 1. ✖ 3
- 2. ✖ 2
- 3. ✔ 0
- 4. ✖ 1

Question Number : 125 Question Id : 5069616740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The crystal structure of martensite is

Options :

- 1. ✖ Body centered cubic
- 2. ✖ Face centered cubic
- 3. ✔ Body centered tetragonal
- 4. ✖ Hexagonal close-packed

Question Number : 126 Question Id : 5069616741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following micro constituents are not there in the Fe-C phase diagram?

Options :

1. ✘ Pearlite
2. ✘ Austenite
3. ✔ Martensite
4. ✘ Delta-ferrite

Question Number : 127 Question Id : 5069616742 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Lever rule is based on

Options :

1. ✔ Mass balance
2. ✘ Energy balance
3. ✘ Heat balance
4. ✘ Momentum balance

Question Number : 128 Question Id : 5069616743 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The diagrams that determine the number of phases formed in steels on cooling them continuously from high temperature to room temperature are

Options :

1. ✓ Continuous Cooling Transformation diagrams
2. ✗ Phase diagrams
3. ✗ Time Temperature Transformation diagrams
4. ✗ Constitution diagram

Question Number : 129 Question Id : 5069616744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following heat treatment processes gives bainite as the final product?

Options :

1. ✗ Martempering
2. ✗ Ausforming
3. ✓ Austempering
4. ✗ Tempering

Question Number : 130 Question Id : 5069616745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The property that is enhanced in steels when the chromium content exceeds 10% is

Options :

- 1. ✖ Electrical property
- 2. ✖ Ductility
- 3. ✖ Magnetic property
- 4. ✔ Resistance to corrosion

Question Number : 131 Question Id : 5069616746 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Grain boundary pinning in steels occurs due to the addition of

Options :

- 1. ✖ Carbon
- 2. ✖ Chromium
- 3. ✖ Sulphur
- 4. ✔ Aluminium

Question Number : 132 Question Id : 5069616747 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is considered as a chemical heat treatment process?

Options :

1. ✓ Carburising process
2. ✗ Flame hardening process
3. ✗ Induction hardening process
4. ✗ LASER hardening process

Question Number : 133 Question Id : 5069616748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Surface hardening is the process in which

Options :

1. ✗ Core and surface are tough
2. ✗ Core and surface are hard
3. ✗ Core is hard and surface is tough
4. ✓ Core is tough and surface is hard

Question Number : 134 Question Id : 5069616749 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The first step of heat treatment for precipitation hardenable alloys is

Options :

1. ✖ Quenching
2. ✔ Solutionizing
3. ✖ Ageing
4. ✖ Tempering

Question Number : 135 Question Id : 5069616750 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following uses a single test specimen to determine the hardenability of steels?

Options :

1. ✔ Jominy end-quench test
2. ✖ Brinell hardness test
3. ✖ Grossman test
4. ✖ Tension test

Question Number : 136 Question Id : 5069616751 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Ageing treatment for Aluminium-Copper is done at

Options :

1. ✖ 300-360 degree Celsius
2. ✖ 270-330 degree Celsius
3. ✔ 130-190 degree Celsius
4. ✖ 490-550 degree Celsius

Question Number : 137 Question Id : 5069616752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one in the following produces the most rapid cooling rate

Options :

1. ✖ Air
2. ✖ Pure water
3. ✖ Oil
4. ✔ Brine

Question Number : 138 Question Id : 5069616753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

18-4-1 high speed steel contains

Options :

1%Vanadium 4 %Chromium 18%Tungsten

1. ✓

4%Vanadium 1 %Chromium 18%Tungsten

2. ✗

1%Vanadium 18 %Chromium 4%Tungsten

3. ✗

4%Vanadium 18 %Chromium 1%Tungsten

4. ✗

Question Number : 139 Question Id : 5069616754 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Where does the maximum temperature generated in the blast furnace?

Options :

1. ✗ In the mantle region

2. ✗ In the hearth region

3. ✓ In front of the tuyeres

4. ✗ In the bottom stack region

Question Number : 140 Question Id : 5069616755 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The main reducing agent in blast furnace operation is

Options :

- 1. ✖ Coke
- 2. ✖ Coal
- 3. ✔ Carbon monoxide
- 4. ✖ Carbon dioxide

Question Number : 141 Question Id : 5069616756 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The main ore charged to the blast furnace for iron production is

Options :

- 1. ✖ Magnetite ore
- 2. ✔ Hematite ore
- 3. ✖ Iron scrap
- 4. ✖ Hot blast

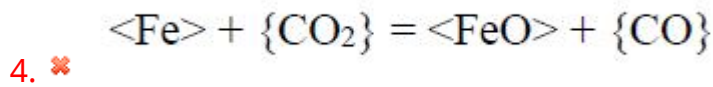
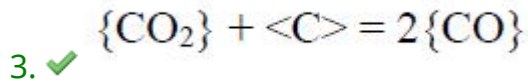
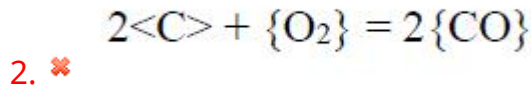
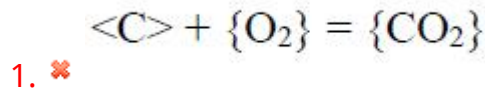
Question Number : 142 Question Id : 5069616757 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the Boudouard equilibrium reaction from the following:

Options :



Question Number : 143 Question Id : 5069616758 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Bleeder valve is provided to the blast furnace at the

Options :

1. ✖ stack region

2. ✖ bosh region

3. ✖ off-takes position

4. ✔ top position of uptakes

Question Number : 144 Question Id : 5069616759 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process of stopping the furnace operation at the end of campaign is known as _____.

Options :

1. ✖ Fanning
2. ✖ Back draughting
3. ✖ Banking
4. ✔ Blowing-out

Question Number : 145 Question Id : 5069616760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Carbon content of pig iron made by blast furnace is

Options :

1. ✔ 3.5 to 4.2
2. ✖ 2.3 to 3.5
3. ✖ 4.0 to 5.2
4. ✖ 0.8 to 1.8

Question Number : 146 Question Id : 5069616761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one from the following is the gas based sponge iron making method?

Options :

1. ✓ Midrex process
2. ✗ Rotary kiln process
3. ✗ SL/RN process
4. ✗ Shaft furnace process

Question Number : 147 Question Id : 5069616762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The molten oxide product of smelting in blast furnace is

Options :

1. ✗ Pig iron
2. ✗ Steel
3. ✓ Slag
4. ✗ Sponge iron

Question Number : 148 Question Id : 5069616763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Vacuum degassing improves steel quality by reducing

Options :

- 1. ✖ Sulphur content
- 2. ✖ Carbon content
- 3. ✔ Hydrogen induced porosity
- 4. ✖ Iron content

Question Number : 149 Question Id : 5069616764 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Heating an ore in the absence of air below its melting point is called

Options :

- 1. ✔ Calcination
- 2. ✖ Roasting
- 3. ✖ Leaching
- 4. ✖ Smelting

Question Number : 150 Question Id : 5069616765 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Sphalerite is the main ore of

Options :

1. ✖ Lead
2. ✖ Tin
3. ✖ Cadmium
4. ✔ Zinc

Question Number : 151 Question Id : 5069616766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Electrolytic refining of aluminium is done by

Options :

1. ✖ Bayer's process
2. ✔ Hoope's process
3. ✖ Hall and Heroult process
4. ✖ Kroll's process

Question Number : 152 Question Id : 5069616767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is obtained from sea water in Dow process?

Options :

1. ✓ MgCl_2
2. ✗ MgO
3. ✗ MgCO_3
4. ✗ Mg_2SiO_4

Question Number : 153 Question Id : 5069616768 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Kroll's process is used to extract

Options :

1. ✗ Aluminium
2. ✗ Copper
3. ✓ Titanium
4. ✗ Tin

Question Number : 154 Question Id : 5069616769 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Pidgeon process is carried out at a temperature of

Options :

1. ✖ 1800°C to 2000°C
2. ✖ 500°C to 600°C
3. ✖ 800°C to 900°C
4. ✔ 1100°C to 1200°C

Question Number : 155 Question Id : 5069616770 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Carnallite is an ore of

Options :

1. ✖ Beryllium
2. ✔ Magnesium
3. ✖ Nickel
4. ✖ Tungsten

Question Number : 156 Question Id : 5069616771 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Anode effect occurs in the extraction of

Options :

1. ✓ Aluminium
2. ✗ Lead
3. ✗ Zinc
4. ✗ Copper

Question Number : 157 Question Id : 5069616772 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In stress -strain curve, Hooke's law is obeyed till

Options :

1. ✓ Proportionality limit
2. ✗ Ultimate tensile strength
3. ✗ Fracture point
4. ✗ Yield point

Question Number : 158 Question Id : 5069616773 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

During the tensile deformation of a ductile metal, necking generally begins at

Options :

1. ✖ Elastic limit
2. ✔ Maximum load
3. ✖ Yield stress
4. ✖ Proportionality limit

Question Number : 159 Question Id : 5069616774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

In Rockwell hardness test, softer materials are usually tested on

Options :

1. ✖ A scale
2. ✔ B scale
3. ✖ C scale
4. ✖ D scale

Question Number : 160 Question Id : 5069616775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

In transition temperature curve, the temperature at which fracture becomes 100 percent cleavage is known as

Options :

- 1. ✓ Nil ductility temperature
- 2. ✗ Fracture appearance transition temperature
- 3. ✗ Fracture transition plastic temperature
- 4. ✗ Ductility transition temperature

Question Number : 161 Question Id : 5069616776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Generally ductile to brittle transition is observed in case of

Options :

- 1. ✗ FCC metals
- 2. ✗ HCP metals
- 3. ✓ BCC metals
- 4. ✗ Composites

Question Number : 162 Question Id : 5069616777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The stress ratio for completely reversed stress cycle is

Options :

- 1. ✖ 1
- 2. ✔ -1
- 3. ✖ 0
- 4. ✖ 0.5

Question Number : 163 Question Id : 5069616778 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following metal exhibits a well-defined endurance limit in the S-N plot of fatigue test

Options :

- 1. ✖ Copper
- 2. ✖ Aluminium
- 3. ✔ Mild steel
- 4. ✖ Magnesium

Question Number : 164 Question Id : 5069616779 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The presence of “beach marks and striations” is a proof that the material had failed through

Options :

1. ✖ Creep
2. ✖ Tensile
3. ✖ Compression
4. ✔ Fatigue

Question Number : 165 Question Id : 5069616780 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Time dependent permanent deformation is called

Options :

1. ✔ Creep
2. ✖ Elastic deformation
3. ✖ Inelastic Deformation
4. ✖ Fatigue

Question Number : 166 Question Id : 5069616781 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following factors is inversely proportional to the magnitude of creep?

Options :

1. ✖ Temperature
2. ✖ Time
3. ✖ Stress
4. ✔ Grain size

Question Number : 167 Question Id : 5069616782 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In ferromagnetic materials, magnetic particle test is used to locate

Options :

1. ✖ Surface defects only
2. ✖ Internal defects only
3. ✖ Sub-surface defects only
4. ✔ Both surface and sub-surface defects

Question Number : 168 Question Id : 5069616783 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Thin sheets from high strength alloys can be produced by using

Options :

1. ✖ Two-high pull over rolling mills
2. ✔ Cluster mills
3. ✖ Forging mills
4. ✖ Drawing mills

Question Number : 169 Question Id : 5069616784 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Sheet and strip with superior surface finish and dimensional tolerances can be produced by

Options :

1. ✔ Cold rolling
2. ✖ Hot rolling
3. ✖ Forging
4. ✖ Extrusion

Question Number : 170 Question Id : 5069616785 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Surface cracking is a

Options :

1. ✖ Rolling defect
2. ✔ Forging defect due to hot shortness
3. ✖ Drawing defect due to folding of two surfaces
4. ✖ Extrusion defect

Question Number : 171 Question Id : 5069616786 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A connecting rod for an internal combustion engine can be produced by _____ operation.

Options :

1. ✖ Edging
2. ✔ Fullering
3. ✖ Drawing
4. ✖ Swaging

Question Number : 172 Question Id : 5069616787 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Lead sheath on electrical cable can be obtained by

Options :

- 1. ✖ Rolling
- 2. ✖ Forging
- 3. ✔ Extrusion
- 4. ✖ Drawing

Question Number : 173 Question Id : 5069616788 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The imperfections responsible for slip are _____.

Options :

- 1. ✖ Shear stress
- 2. ✖ Stacking faults
- 3. ✖ Impurities
- 4. ✔ Dislocations

Question Number : 174 Question Id : 5069616789 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The replacement of cold worked structure by a new set of strain-free grains is

Options :

1. ✗ Recovery
2. ✗ Grain growth
3. ✓ Recrystallisation
4. ✗ Grain Growth

Question Number : 175 Question Id : 5069616790 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The CRSS for a single crystal is maximum when

Options :

1. ✓ $\Phi = \lambda = 45^\circ$
2. ✗ $\Phi = 45^\circ, \lambda = 60^\circ$
3. ✗ $\Phi = 30^\circ, \lambda = 45^\circ$
4. ✗ $\Phi = \lambda = 60^\circ$

Question Number : 176 Question Id : 5069616791 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Work hardening is also called

Options :

1. ✖ Twinning
2. ✖ Slip
3. ✖ Hardening
4. ✔ Strain hardening

Question Number : 177 Question Id : 5069616792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Yield – point phenomenon is observed in

Options :

1. ✔ Low carbon steels
2. ✖ Die steels
3. ✖ Tool steels
4. ✖ Dual phase steels

Question Number : 178 Question Id : 5069616793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Example for low stacking fault energy metal is

Options :

1. ✖ Beryllium
2. ✔ Austenitic stainless steel
3. ✖ Magnesium alloy
4. ✖ Tungsten

Question Number : 179 Question Id : 5069616794 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In gating system, sprue is usually tapered to

Options :

1. ✔ Avoid air aspiration effect
2. ✖ Quickly fill the mould cavity
3. ✖ Minimize the temperature gradient
4. ✖ Improve surface finish

Question Number : 180 Question Id : 5069616795 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The main disadvantage of sand casting is

Options :

1. ✓ Rough surface finish
2. ✗ High equipment cost
3. ✗ Not economical for low quantities
4. ✗ Inability to cast complex geometries

Question Number : 181 Question Id : 5069616796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following casting process has inherently high level of porosity?

Options :

1. ✗ Gravity Die casting
2. ✗ Investment casting
3. ✓ High pressure Die casting
4. ✗ Centrifugal casting

Question Number : 182 Question Id : 5069616797 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Solidification shrinkage occurs in nearly all metals because of

Options :

1. ✖ the temperature gradient during the solidification
2. ✖ the stresses occurring in solid and liquid phase during solidification
3. ✔ the solid phase has a higher density than the liquid phase
4. ✖ the liquid phase has a higher density than the solid phase

Question Number : 183 Question Id : 5069616798 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following mould material is used in permanent mould casting?

Options :

1. ✔ Grey cast iron
2. ✖ Sand
3. ✖ Ceramic
4. ✖ Plaster

Question Number : 184 Question Id : 5069616799 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is used for making cavities and hollow projections in casting?

Options :

- 1. ✖ Padding
- 2. ✖ Core print
- 3. ✔ Core
- 4. ✖ Muller

Question Number : 185 Question Id : 5069616800 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which type of pattern is used in investment casting to create intricate and detailed shapes?

Options :

- 1. ✔ Wax pattern
- 2. ✖ Sweep pattern
- 3. ✖ Wood pattern
- 4. ✖ Metal pattern

Question Number : 186 Question Id : 5069616801 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In casting, gating ratio is defined as the ratio of cross-sectional area of

Options :

- 1. ✓ Sprue: runner: gate
- 2. ✗ Runner: sprue: gate
- 3. ✗ Gate: sprue: runner
- 4. ✗ Gate: runner: sprue

Question Number : 187 Question Id : 5069616802 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

An expendable mould is used in

Options :

- 1. ✓ Sand casting
- 2. ✗ Permanent mould casting
- 3. ✗ Die casting
- 4. ✗

Continuous casting

Question Number : 188 Question Id : 5069616803 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which casting process involves the use of a rotating mould to obtain cylindrical shapes

Options :

Sand casting

1. ✖

Die casting

2. ✖

Investment casting

3. ✖

Centrifugal casting

4. ✔

Question Number : 189 Question Id : 5069616804 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Misrun is a casting defect that occurs because of

Options :

Rapid pouring

1. ✖

Low fluidity of molten metal

2. ✔

3. ✖

High fluidity of molten metal

High pouring temperature

4. ✖

Question Number : 190 Question Id : 5069616805 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is a casting defect associated with the solidification process?

Options :

Hot Tears

1. ✔

Alligatoring

2. ✖

Earing

3. ✖

Orange peel

4. ✖

Question Number : 191 Question Id : 5069616806 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

When no filler is employed in welding process then the process is said to be

Options :

Autogenous

1. ✔

Homogenous

2. ✖

3. ✖ Heterogenous

4. ✖ Stick electrode

Question Number : 192 Question Id : 5069616807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In which of the following welding process granular flux is used?

Options :

1. ✔ Submerged Arc Welding

2. ✖ Shielded Metal Arc Welding

3. ✖ Plasma Arc Welding

4. ✖ Gas Metal Arc Welding

Question Number : 193 Question Id : 5069616808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is not suitable to join thin metal sheets?

Options :

1. ✖ Metal Inert Gas Welding

2. ✖ Laser Welding

Resistance Spot Welding

3. ✖

Electro Slag Welding

4. ✔

Question Number : 194 Question Id : 5069616809 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The most common welding process used for welding of rails

Options :

Resistance spot welding

1. ✖

Tungsten inert gas welding

2. ✖

Thermit welding

3. ✔

Gas Tungsten arc welding

4. ✖

Question Number : 195 Question Id : 5069616810 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The main heat generation mechanism in resistance spot welding is by

Options :

Friction

1. ✖

Arcing

2. ✖

3. ✖

Plasma

4. ✓ Joule heating

Question Number : 196 Question Id : 5069616811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Which among the following classifies under radiant energy welding process?

Options :

1. ✗ Electro gas welding

2. ✓ Electron Beam welding

3. ✗ Electro Slag welding

4. ✗ Ultrasonic welding

Question Number : 197 Question Id : 5069616812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Keyhole formation is associated with which one of the following welding processes

Options :

1. ✗ Friction Welding

2. ✓

Laser Welding

Ultrasonic Welding

3. ✖

Manual Metal Arc Welding

4. ✖

Question Number : 198 Question Id : 5069616813 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Preheating prior to welding is done for the purpose of

Options :

1. ✖ Ensuring full penetration

2. ✖ Facilitating fusion of high melting metals

3. ✔ Decreasing cooling rate

4. ✖ Burn away oil, grease etc. from the plate surface

Question Number : 199 Question Id : 5069616814 Question Type : MCQ Option Shuffling : Yes
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

With increasing carbon or martensite in the weld metal or in the heat-affected zone, or both, weldability generally

Options :

1. ✔ Decreases

Increases

2. ✖

Does not change

3. ✖

Cannot be determined

4. ✖

Question Number : 200 Question Id : 5069616815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A cavity-like discontinuity that forms when gas is entrapped in solidifying weld metal is

Options :

Undercut

1. ✖

Porosity

2. ✔

Crater

3. ✖

Overlap

4. ✖