

Andhra Pradesh State Council of Higher Education

Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

Question Paper Name :

Metallurgical Engineering 06th May 2025
Shift 2

Subject Name :

Metallurgical Engineering

Creation Date :

2025-05-06 20:31:58

Duration :

180

Total Marks :

200

Display Marks:

No

Share Answer Key With Delivery Engine :

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 :

89040178

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 :

890401303

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 :	890401327
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 89040115413 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Order of the matrix $\begin{bmatrix} 1 & 6 \\ 2 & 0 \\ 7 & -1 \end{bmatrix}$ is

Options :

1. ✖ 1×3
2. ✔ 3×2
3. ✖ 2×2
4. ✖ 3×3

Question Number : 2 Question Id : 89040115414 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If two rows (or columns) of a determinant of order 3 are identical then the value of determinant is

Options :

1. ✔ 0
2. ✖ 1
3. ✖ -1

4. ✖ -1

Question Number : 3 Question Id : 89040115415 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Co-factor of -4 in $\begin{vmatrix} 1 & 2 & 3 \\ -4 & 3 & 6 \\ 2 & -7 & 9 \end{vmatrix}$ is

Options :

1. ✖ 3

2. ✖ 11

3. ✖ 39

4. ✔ -39

Question Number : 4 Question Id : 89040115416 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Matrix $\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$ is

Options :

1. ✖ skew symmetric

2. ✔ Symmetric

3. ✖ symmetric if $a=b$

4. ✖ Skew symmetric if $b=c$

Question Number : 5 Question Id : 89040115417 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ then $(A^{-1}) =$

Options :

1. ✓ A
2. ✗ $-A$
3. ✗ $-2A$
4. ✗ 0

Question Number : 6 Question Id : 89040115418 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $\deg f(x) \geq \deg g(x)$, then the rational fraction $\frac{f(x)}{g(x)}$ is called

Options :

1. ✗ Polynomial
2. ✗ Proper fraction
3. ✓ Improper fraction
4. ✗ irrational fraction

Question Number : 7 Question Id : 89040115419 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\frac{3x}{x^2+x-2} = \frac{A}{x+2} + \frac{B}{x-1}$ then the ordered pair (A, B) is

Options :

1. ✖ (1, 2)

2. ✖ (-1, 2)

3. ✖ (2, -1)

4. ✔ (2, 1)

Question Number : 8 Question Id : 89040115420 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $\tan A = \frac{4}{3}$ then the value of $\cos 2A$ is

Options :

1. ✔ $-\frac{7}{25}$

2. ✖ $-\frac{7}{24}$

3. ✖ $-\frac{24}{7}$

4. ✖ $-\frac{7}{25}$

Question Number : 9 Question Id : 89040115421 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $-1 \leq x \leq 1$, then $\cos^{-1} x + \sin^{-1} x =$

Options :

1. ✖ $-\frac{\pi}{2}$

2. ✖ $\frac{\pi}{4}$

3. ✔ $\frac{\pi}{2}$

4. ✖ $-\frac{\pi}{16}$

Question Number : 10 Question Id : 89040115422 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\sin 15^\circ =$

Options :

1. ✖ $\frac{\sqrt{3}-1}{\sqrt{3}+2}$

2. ✔ $\frac{\sqrt{6}-\sqrt{2}}{4}$

3. ✖ $\sqrt{6} \pm 1$

4. ✖ $\frac{\sqrt{6}+\sqrt{2}}{4}$

Question Number : 11 Question Id : 89040115423 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $2 \cos \theta = x + \frac{1}{x}$ then $2 \cos 3\theta =$

Options :

1. ✖ $x^3 - \frac{1}{x^3}$

2. ✖ $-x^3 + \frac{1}{x^3}$

3. ✔ $x^3 + \frac{1}{x^3}$

4. ✖ $x^2 + \frac{1}{x^3}$

Question Number : 12 Question Id : 89040115424 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In any $\triangle ABC$, $\tan \frac{B+C}{2} =$

Options :

1. ✖ $c \cot \frac{A}{2}$

2. ✔ $\cot \frac{A}{2}$

3. ✖ $\tan \frac{A}{2}$

4. ✖ $\tan \frac{C}{2}$

Question Number : 13 Question Id : 89040115425 Question Type : MCQ Option Shuffling : No

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Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a triangle ΔABC , the value of $\cos\left(\frac{B+C}{2}\right)$ in terms of angle A

Options :

1. ✖ $\sqrt{\sin \frac{A}{2}}$

2. ✖ $\sqrt{A/2}$

3. ✔ $\sin \frac{A}{2}$

4. ✖ $\sqrt{2A}$

Question Number : 14 Question Id : 89040115426 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of $\sin 45^\circ$ is

Options :

1. ✖ $\sqrt{2}$

2. ✖ 1

3. ✖ 0

4. ✔ $1/\sqrt{2}$

Question Number : 15 Question Id : 89040115427 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a ΔABC , if $a = 13$, $b = 14$ and $c = 15$ then the value of $\tan\left(\frac{A}{2}\right)$ is

Options :

1. ✖ $\frac{1}{4}$

2. ✖ $\frac{3}{4}$

3. ✔ $\frac{1}{2}$

4. ✖ $\frac{1}{6}$

Question Number : 16 Question Id : 89040115428 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a ΔABC , $\sum a^3 \cos(B - C) =$

Options :

1. ✖ $4abc$

2. ✔ $3abc$

3. ✖ $4a+b+c$

4. ✖ abc

Question Number : 17 Question Id : 89040115429 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Principle value of $\cot^{-1}(-1)$ is

Options :

1. ✖ $\frac{2\pi}{3}$

2. ✖ $-\frac{2\pi}{3}$

3. ✖ π

4. ✔ $\frac{3\pi}{4}$

Question Number : 18 Question Id : 89040115430 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$(-1 + 2i) + \left(\frac{1}{2} - i\right) =$$

Options :

1. ✖ $\frac{1}{2} + i$

2. ✖ $-\frac{1}{2} - i$

3. ✔ $-\frac{1}{2} + i$

4. ✖ $\frac{1}{2} \pm i$

Question Number : 19 Question Id : 89040115431 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\text{For any real } \theta, (\cos \theta + i \sin \theta)(\cos \theta - i \sin \theta) =$$

Options :

- 1. ✓ 1
- 2. ✗ -1
- 3. ✗ 0
- 4. ✗ 4i

Question Number : 20 Question Id : 89040115432 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The centre and radius of the circle $x^2 + y^2 - 4x - 8y - 41 = 0$ are

Options :

- 1. ✗ $(1, -2), 5$
- 2. ✗ $(2, 1), 3$
- 3. ✓ $(2, 4), \sqrt{61}$
- 4. ✗ $(1, -2), \sqrt{51}$

Question Number : 21 Question Id : 89040115433 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The number of common tangents to the circles $x^2 + y^2 - x = 0$ and $x^2 + y^2 + x = 0$ is

Options :

- 1. ✗ 2
- 2. ✗ 1

3. ✖ 4

4. ✔ 3

Question Number : 22 Question Id : 89040115434 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Equation of the circle with centre $(-3, 2)$ and radius 4 is

Options :

1. ✖ $(x^2 + 3)^2 + (y + 2)^2 = 4^2$

2. ✖ $(x - 3)^2 + (y + 2)^2 = 16$

3. ✔ $(x + 3)^2 + (y - 2)^2 = 16$

4. ✖ $(x - 2) + (y + 3)^2 = 4^2$

Question Number : 23 Question Id : 89040115435 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The length of the latus rectum of the parabola $y^2 = 12x$ and the focal distance of the point $(3, -6)$ is

Options :

1. ✖ 3, 4

2. ✖ 2, 6

3. ✖ -12, 6

4. ✔ 12, 6

Question Number : 24 Question Id : 89040115436 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The equation of the Parabola, whose focus is (0,-2) and the vertex is (0,0), is

Options :

1. ✖ $y^2 = 32x$
2. ✔ $x^2 = -8y$
3. ✖ $x^2 = 4y$
4. ✖ $y^2 = -32x$

Question Number : 25 Question Id : 89040115437 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The eccentricity of $x^2 + 2y^2 = 3$ is

Options :

1. ✖ $\frac{1}{\sqrt{2}}$
2. ✖ $\sqrt{2}$
3. ✖ $\pm\sqrt{2}$
4. ✔ $\frac{\sqrt{3}}{2}$

Question Number : 26 Question Id : 89040115438 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx}[e^x(x^2 + 1)] =$$

Options :

1. ✓ $e^x(2x + x^2 + 1)$

2. ✗ $e^x(2x - x^2 + 1)$

3. ✗ $e^x(2x + x^3 + 1)$

4. ✗ $e^{-x}(2x + x^2 + 1)$

Question Number : 27 Question Id : 89040115439 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\text{When } a > 0, \lim_{x \rightarrow 0} \frac{a^x - 1}{x} =$$

Options :

1. ✓ $\log a$

2. ✗ 0

3. ✗ $\log (x-1)$

4. ✗ $\log (x-a)$

Question Number : 28 Question Id : 89040115440 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} [\tan^{-1} x] =$$

Options :

1. ✓ $\frac{1}{x^2+1}$

2. ✗ $-\frac{1}{x^2-1}$

3. ✗ $\frac{2}{x^2+2}$

4. ✗ $-\frac{1}{x^2+1}$

Question Number : 29 Question Id : 89040115441 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $4x-7y+15=0$ then derivative of y with respect to x is

Options :

1. ✗ $-4/7$

2. ✗ 0

3. ✗ 4

4. ✓ $4/7$

Question Number : 30 Question Id : 89040115442 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $y = \cos x$ then $\frac{d^2y}{dx^2} =$

Options :

1. ✓ $-\cos x$

2. ✗ $-\sin x$

3. ✗ $\cos x$

4. ✗ $\sin x$

Question Number : 31 Question Id : 89040115443 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $u = e^x \sin y$ then first partial derivative of u with respect to y is

Options :

1. ✗ $e^x \sin y$

2. ✓ $e^x \cos y$

3. ✗ $-e^x \cos y$

4. ✗ 0

Question Number : 32 Question Id : 89040115444 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \left(e^{3 \log x} \right) =$$

Options :

1. ✗ $\log x$

2. ✗

3x

3. ✖ x^3

4. ✔ $3x^2$

Question Number : 33 Question Id : 89040115445 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $u(x, y) = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{y}{x}$ then $xu_x + yu_y =$

Options :

1. ✖ $u'(x, y)$

2. ✔ 0

3. ✖ 1

4. ✖ $u(x, y)$

Question Number : 34 Question Id : 89040115446 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $S = 12t - 3t^2$ then $\frac{ds}{dt} =$

Options :

1. ✔ $12 - 6t$

2. ✖ $12t - 6$

3. ✖

$$12 - 3t$$

4. ✖ $12 - 6t^2$

Question Number : 35 Question Id : 89040115447 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\int \cot^2 x \, dx =$$

Options :

1. ✖ $-\cot x + x + c$

2. ✖ $\cot x - x + c$

3. ✖ $\cot^2 x - x + c$

4. ✔ $-\cot x - x + c$

Question Number : 36 Question Id : 89040115448 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

$$\int \frac{1}{\sqrt{a^2 - x^2}} \, dx =$$

Options :

1. ✖ $\log|x + \sqrt{x^2 + a^2}| + c$

2. ✖ $\log|x + \sqrt{x^2 - a^2}| + c$

3. ✔ $\sin^{-1} \frac{x}{a} + c$

4. ✖ $\sin^{-1}x$

Question Number : 37 Question Id : 89040115449 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int e^x \cos x \, dx =$$

Options :

1. ✔ $\frac{1}{2}e^x(\cos x + \sin x) + c$

2. ✖ $\frac{1}{2}e^x \cos x$

3. ✖ $\frac{1}{2}e^x(\cos x + \operatorname{cosec} x) + c$

4. ✖ $\frac{1}{2}e^x(\cos x - \sin x) + c$

Question Number : 38 Question Id : 89040115450 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \frac{dx}{\sqrt{x}} =$$

Options :

1. ✖ $-2\sqrt{x} + c$

2. ✖ $\sqrt{x} + c$

3. ✔ $2\sqrt{x} + c$

4. ✖ $x + c$

Question Number : 39 Question Id : 89040115451 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \sin \frac{y}{2} dy =$$

Options :

1. ✖ $2 \cos \frac{y}{2} + c$

2. ✖ $2 \sin x/2 + c$

3. ✖ $2 \cos 2y + c$

4. ✔ $-2 \cos \frac{y}{2} + c$

Question Number : 40 Question Id : 89040115452 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\pi} dx =$$

Options :

1. ✖ $\frac{\pi}{2}$

2. ✖ $-\frac{\pi}{2}$

3. ✔ π

4. ✖ $\frac{\pi}{8}$

Question Number : 41 Question Id : 89040115453 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

If $f(x)$ is an even function, then $\int_{-a}^a f(x) dx =$

Options :

1. ✖ $\int_0^a f(x) dx$
2. ✔ $2 \int_0^a f(x) dx$
3. ✖ $2a$
4. ✖ 0

Question Number : 42 Question Id : 89040115454 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The area under the curve $f(x) = \sin x$ in $[0, 2\pi]$ is

Options :

1. ✖ 1
2. ✖ 3
3. ✖ -4
4. ✔ 4

Question Number : 43 Question Id : 89040115455 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

When $a=b$ then $\int_a^b f(x)dx =$

Options :

1. ✖ b
2. ✔ 0
3. ✖ a
4. ✖ 2a

Question Number : 44 Question Id : 89040115456 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Order of the differential equation $\left[\frac{d^2y}{dx^2} + \left(\frac{dy}{dx} \right)^3 \right]^{6/5} = 6y$ is

Options :

1. ✖ 3
2. ✔ 2
3. ✖ 6/5
4. ✖ 3

Question Number : 45 Question Id : 89040115457 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Integrating factor of $\frac{dy}{dx} + 3x = 2y$ is

Options :

1. ✖

e^{3x}

2. ✓ e^{-2x}

3. ✗ e^x

4. ✗ 0

Question Number : 46 Question Id : 89040115458 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Transform $dx + xdy = e^{-y}\sec^2 y \, dy$ into linear form

Options :

1. ✗ $\frac{dx}{dy} - x = e^{-y}\sec^2 y$

2. ✗ $\frac{dx}{dy} = e^{-y}\sec^2 y$

3. ✗ $\frac{dx}{dy} + x = e^{-y}\sec^2 y + c$

4. ✓ $\frac{dx}{dy} + x = e^{-y}\sec^2 y$

Question Number : 47 Question Id : 89040115459 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The necessary and sufficient condition for the differential equation $Mdx + Ndy = 0$ to be exact is

Options :

1. ✗

$$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial y}$$

2. ✓ $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

3. ✗ $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$

4. ✗ $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial x}$

Question Number : 48 Question Id : 89040115460 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Complementary function of the differential equation $(D^3 - 8)y = x$ is

Options :

1. ✗ $c_1 e^{2x} + e^x \{c_2 \cos(x\sqrt{3}) + c_3 \sin x\sqrt{3}\}$

2. ✗ $c_1 e^{2x} + e^{-x} (\cos\sqrt{3} + \sin\sqrt{3})$

3. ✗ $c_1 e^{-2x} + c_2 e^{-x} + c_3 \cos x$

4. ✓ $c_1 e^{2x} + e^{-x} \{c_2 \cos(x\sqrt{3}) + c_3 \sin(x\sqrt{3})\}$

Question Number : 49 Question Id : 89040115461 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Bernoulli's equation is of the form

Options :

1. ✖ $\left(\frac{dy}{dx}\right) + y = Qy$

2. ✖ $\left(\frac{dy}{dx}\right)^2 + y^n = Qy$

3. ✔ $\left(\frac{dy}{dx}\right) + Py = Qy^n$

4. ✖ $\left(\frac{d^2y}{dx^2}\right) + Py = Qy^n$

Question Number : 50 Question Id : 89040115462 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Particular integral of $f(D)y = \cos ax$ is

Options :

1. ✔ $\frac{1}{f(-a^2)} \cos ax$ if $f(-a^2) \neq 0$

2. ✖ $\frac{1}{f(a^2)} \cos ax$ if $f(-a^2) \neq 0$

3. ✖ $\frac{1}{f(a)} \cos ax$ if $f(-a^2) \neq 0$

4. ✖ $\frac{1}{2} \cos ax$ if $f(-a^2) \neq 0$

Physics

Section Id :	890401304
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 :	890401328
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 89040115463 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the unit of mass is 1 Kg, the unit of length is 1m and the unit of time is 1 minute,
the unit of pressure in Nm^{-2} is

Options :

1. ✖ $\frac{1}{60}$

2. ✖ 60

3. ✔ $\frac{1}{3600}$

4. ✖ 3600

Question Number : 52 Question Id : 89040115464 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

MLT^{-1} is the dimensional formula for

Options :

1. ✖

Speed

2. ✖ Acceleration

3. ✔ Impulse

4. ✖ Force

Question Number : 53 Question Id : 89040115465 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If $|\vec{A} \times \vec{B}| = \sqrt{3} \vec{A} \cdot \vec{B}$ then the value of $|\vec{A} + \vec{B}|$ is

Options :

1. ✔ $(A^2 + B^2 + AB)^{1/2}$

2. ✖ $(A^2 + B^2 + \frac{AB}{\sqrt{2}})^{1/2}$

3. ✖ $A + B$

4. ✖ $(A^2 + B^2 + \sqrt{3}AB)^{1/2}$

Question Number : 54 Question Id : 89040115466 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Of the vectors given below, the parallel vectors are

$$\vec{A} = 6\hat{i} + 8\hat{j} \quad \vec{B} = 210\hat{i} + 280\hat{k} \quad \vec{C} = 5.1\hat{i} + 6.8\hat{j} \quad \vec{D} = 3.6\hat{i} + 8\hat{j} + 48\hat{k}$$

Options :

1. ✔ $\vec{A}$ and $\vec{C}$

2. ✖ $\vec{A}$ and $\vec{B}$

3. ✖ $\vec{A}$ and $\vec{D}$

4. ✖ $\vec{C}$ and $\vec{D}$

Question Number : 55 Question Id : 89040115467 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The position x of a particle with respect to time ' t ' along x - axis is given by $x = 9t^2 - t^3$ where x is in metres and t in seconds. The position of this particle when it achieves maximum speed along the x direction is

Options :

1. ✖ 24 m

2. ✖ 32 m

3. ✔ 54 m

4. ✖ 81 m

Question Number : 56 Question Id : 89040115468 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A ball is projected vertically up with a velocity of 40 ms^{-1} from ground. At the same time another ball is dropped from a height of 100 m. The magnitudes of their velocities are equal after

Options :

1. ✖ 1 s

2. ✓ 2 s

3. ✗ 3 s

4. ✗ 4 s

Question Number : 57 Question Id : 89040115469 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two stones are projected with the same speed but making different angles with the horizontal. Their horizontal ranges are equal. The angle of projection of one is $\pi/3$ and the maximum height reached by it is 102 metres. Then the maximum height reached by the other in metres is

Options :

1. ✗ 336

2. ✗ 224

3. ✗ 56

4. ✓ 34

Question Number : 58 Question Id : 89040115470 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A projectile is thrown into air with velocity u at an angle θ to the horizontal. The time at which its direction of motion is perpendicular to its initial direction is

Options :

1. ✓ $\frac{u}{g \sin \theta}$

2. ✗

$$\frac{u}{g \cos \theta}$$

3. ✖ $\frac{u}{g \tan \theta}$

4. ✖ $\frac{u}{g \cot \theta}$

Question Number : 59 Question Id : 89040115471 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

When a bicycle is in motion and pedalled, the force of friction exerted by ground on the two wheels is such that it acts

Options :

1. ✔ In the backward direction on the front wheel and in the forward direction on the rear wheel
2. ✖ In the forward direction on the front wheel and in the backward direction on the rear wheel
3. ✖ In the backward direction on both the front and rear wheels
4. ✖ In the forward direction on both the front and rear wheels

Question Number : 60 Question Id : 89040115472 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Two blocks of masses 4 Kg and 2 Kg are connected by a heavy string and placed on rough horizontal plane. The 2 Kg block is pulled with a constant force F. The coefficient of friction between the blocks and the ground is 0.5. The value of F so that tension in the string is constant throughout during the motion of the blocks is

Options :

1. ✖

40 N

2. ✓ 30 N

3. ✗ 50 N

4. ✗ 60 N

Question Number : 61 Question Id : 89040115473 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a hydroelectric power station, the height of the dam is 10 m. How many kilograms of water must fall per second on the blades of a turbine in order to generate 1 MW of electrical power? [$g = 10 \text{ m/s}^2$].

Options :

1. ✗ 10^3 Kg/s

2. ✓ 10^4 Kg/s

3. ✗ 10^5 Kg/s

4. ✗ 10^6 Kg/s

Question Number : 62 Question Id : 89040115474 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The kinetic energy at the highest point of the trajectory of a projectile is 200 J. If the mass of the projectile is 1 Kg and the maximum height reached by it is 20 m, then velocity of the projectile from the ground is

Options :

1. ✖ 20 m/s
2. ✖ 10 m/s
3. ✔ $20\sqrt{2}$ m/s
4. ✖ $10\sqrt{2}$ m/s

Question Number : 63 Question Id : 89040115475 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A force applied by an engine on train of mass 2.05×10^6 Kg changes its velocity from 5 m/s to 25 m/s in 5 minutes. The power of the engine is

Options :

1. ✖ 1.025 MW
2. ✔ 2.05 MW
3. ✖ 5 MW
4. ✖ 6 MW

Question Number : 64 Question Id : 89040115476 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two identical wires have a fundamental frequency of 100 Hz when kept under the same tension. If the tension of one of the wires is increased by 21%, the number of beats produced is

Options :

1. ✖ 11

2. ✓ 10

3. ✗ 9

4. ✗ 8

Question Number : 65 Question Id : 89040115477 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A body executing S.H.M. has a maximum velocity of 1 ms^{-1} and a maximum acceleration of 4 ms^{-2} . Its amplitude in metres is:

Options :

1. ✗ 1

2. ✗ 0.75

3. ✗ 0.5

4. ✓ 0.25

Question Number : 66 Question Id : 89040115478 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A simple pendulum of length l_1 has frequency $\frac{1}{4}$ Hz and another simple pendulum of length l_2 has frequency $\frac{1}{3}$ Hz. Then time period of pendulum of length $(l_1 + l_2)$ is

Options :

1. ✗ 5 s

2. ✗ 1 s

3. ✓ $\sqrt{7}$ s

4. ✗ $\sqrt{12}$ s

Question Number : 67 Question Id : 89040115479 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A source of sound producing wavelength of 50 cm is moving away from stationary observer with $\frac{1}{5}$ th speed of sound. The wavelength of the sound heard by the observer is

Options :

1. ✗ 70 cm

2. ✗ 55 cm

3. ✗ 40 cm

4. ✓ 60 cm

Question Number : 68 Question Id : 89040115480 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

To have a good sound effect inside a hall

Options :

1. ✗ the hall should not have any sound absorbing material

2. ✗ the reverberation time has to be maximum

3. ✗ the reverberation time has to be zero

4. ✓ the reverberation time has to be optimum

Question Number : 69 Question Id : 89040115481 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the pressure of an ideal gas contained in a closed vessel is increased by 0.5%, the increase in temperature is 2°C . The initial temperature of the gas is

Options :

1. ✗ 27°C

2. ✓ 127°C

3. ✗ 300°C

4. ✗ 400°C

Question Number : 70 Question Id : 89040115482 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

During the free expansion of an ideal gas, which of the following physical quantity remains constant

Options :

1. ✓ Temperature

2. ✗ Pressure

3. ✗ Volume

4. ✗ Ratio of pressure to volume

Question Number : 71 Question Id : 89040115483 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The specific heat at constant volume for a monoatomic gas is 0.075 cal/kg/K and its gram molecular specific heat is 3 cal/mol/K . Then mass of one atom of that gas is

Options :

1. ✓ $6.67 \times 10^{-23} \text{ gm}$
2. ✗ $6.67 \times 10^{23} \text{ gm}$
3. ✗ $2 \times 10^{-23} \text{ gm}$
4. ✗ $2 \times 10^{23} \text{ gm}$

Question Number : 72 Question Id : 89040115484 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A rigid diatomic ideal gas undergoes an adiabatic process at room temperature. The relation between temperature and volume of this process is $TV^x = \text{constant}$. Then x is

Options :

1. ✗ $\frac{5}{3}$
2. ✓ $\frac{2}{5}$
3. ✗ $\frac{2}{3}$
4. ✗ $\frac{3}{5}$

Question Number : 73 Question Id : 89040115485 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A carnot engine having an efficiency of $\frac{1}{10}$ as heat engine, is used as a refrigerator. If the work done on the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is

Options :

1. ✖ 100 J

2. ✖ 99 J

3. ✔ 90 J

4. ✖ 80 J

Question Number : 74 Question Id : 89040115486 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two photons of energy 2.5 eV and 3.5 eV fall on a metal surface of work function 1.5 eV.

The ratio of the maximum velocities of the photoelectrons emitted from the metal surface is

Options :

1. ✖ 1 : 4

2. ✖ 2 : 1

3. ✖ 1 : 2

4. ✔ $1 : \sqrt{2}$

Question Number : 75 Question Id : 89040115487 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At critical angle, the angle of refraction is

Options :

1. ✖ 45^0
2. ✔ 90^0
3. ✖ 120^0
4. ✖ 180^0

Chemistry

Section Id :	890401305
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 :	890401329
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 89040115488 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The quantum number which describes the shape of an atomic orbital is indicated by the symbol

Options :

1. ✔ l
2. ✖ ml
3. ✖

4. ✖ 11

Question Number : 77 Question Id : 89040115489 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

“No two electrons in an atom can have the same set of four quantum numbers”.
This is known as

Options :

1. ✖ Pauli's Principle

2. ✔ Hund's Rule

3. ✖ Aufbau Principle

4. ✖ Lewis Rule

Question Number : 78 Question Id : 89040115490 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In the elements with atomic number $Z=1$ to $Z=20$,
how many of them have no unpaired electrons in their ground state?

Options :

1. ✖ 8

2. ✖ 4

3. ✖ 10

4. ✔ 6

Question Number : 79 Question Id : 89040115491 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is not a property of covalent compounds?

Options :

1. ✖ They are generally insoluble in water
2. ✖ They consist of molecules
3. ✖ They exist as solids, liquids or gases
4. ✔ The reactions between them are fast

Question Number : 80 Question Id : 89040115492 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The sum of covalent bonds in H_2 , N_2 and HCl is

Options :

1. ✖ 4
2. ✔ 5
3. ✖ 6
4. ✖ 3

Question Number : 81 Question Id : 89040115493 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

How many grams of NaOH is required to prepare 5.0 litre of 0.1 N solution?

(Given: At. wt: H=1, O=16, Na=23)

Options :

- 1. ✓ 20
- 2. ✗ 30
- 3. ✗ 10
- 4. ✗ 50

Question Number : 82 Question Id : 89040115494 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A gaseous mixture contains 8g of oxygen, 14 g of nitrogen and 8 g of hydrogen.

Total number of molecules present in the gaseous mixture is

(Given: At. wt: H=1, N=14, O=16, $N_A = 6 \times 10^{23} \text{ mol}^{-1}$)

Options :

- 1. ✗ 1.43×10^{23}
- 2. ✗ 2.85×10^{23}
- 3. ✓ 2.85×10^{24}
- 4. ✗ 1.85×10^{24}

Question Number : 83 Question Id : 89040115495 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equivalent weight of which of the following is the highest?

Options :

- 1. ✗ Na_2CO_3 (molecular weight = 106)

2. ✖ H_3PO_4 (molecular weight = 98)
3. ✔ $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$ (molecular weight = 126)
4. ✖ AlCl_3 (molecular weight = 133.5)

Question Number : 84 Question Id : 89040115496 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At 25°C , ionic product (K_w) of 0.01M HCl solution is

Options :

1. ✖ $1.0 \times 10^{-13} \text{ mol}^2/\text{L}^2$
2. ✖ $1.0 \times 10^{-12} \text{ mol}^2/\text{L}^2$
3. ✔ $1.0 \times 10^{-14} \text{ mol}^2/\text{L}^2$
4. ✖ $1.0 \times 10^{-15} \text{ mol}^2/\text{L}^2$

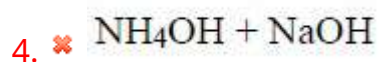
Question Number : 85 Question Id : 89040115497 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following combinations give a buffer solution?

Options :

1. ✖ $\text{HCl} + \text{NaCl}$
2. ✔ $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$



Question Number : 86 Question Id : 89040115498 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A current of 0.5 amp is passed through molten AlCl_3 for 96.5 seconds. The volume of Cl_2 gas liberated at STP at anode (in ml) is ($\text{Cl} = 35.5 \text{ u}$) ($1\text{F} = 96500 \text{ C mol}^{-1}$)

Options :

1. ✖ 11.2

2. ✖ 22.4

3. ✔ 5.6

4. ✖ 33.6

Question Number : 87 Question Id : 89040115499 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The amount of substance deposited due to passage of 1F of electricity is called

Options :

1. ✖ Atomic weight

2. ✔ Equivalent weight

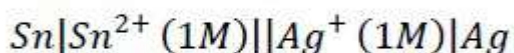
3. ✖ Electrochemical equivalent

4. ✖ Molecular weight

Question Number : 88 Question Id : 89040115500 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the emf of the cell?



[Given $E_{\text{Sn}^{2+}|\text{Sn}}^0 = -0.14V$ and $E_{\text{Ag}^+|\text{Ag}}^0 = +0.80 V$]

Options :

1. ✖ 0.66 V

2. ✖ 0.80 V

3. ✖ 1.08 V

4. ✔ 0.94 V

Question Number : 89 Question Id : 89040115501 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the standard reduction potentials of A,B,C are respectively 0.68V, -2.54V and -0.50 V, then the order of their reducing power is

Options :

1. ✖ A>B>C

2. ✖ A>C>B

3. ✖ C>B>A

4. ✔ B>C>A

Question Number : 90 Question Id : 89040115502 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

With which of the following anions, Mg^{2+} and Ca^{2+} ions form salts responsible for permanent hardness of water?

Options :

1. ✓ Cl^- , SO_4^{2-}
2. ✗ Cl^- , NO_2^-
3. ✗ HCO_3^- , Cl^-
4. ✗ CO_3^{2-} , HCO_3^-

Question Number : 91 Question Id : 89040115503 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Exhausted permutit is regenerated by washing with

Options :

1. ✗ Dilute NaOH solution
2. ✓ Dilute NaCl solution
3. ✗ Dilute HCl solution
4. ✗ Dilute AlCl_3 solution

Question Number : 92 Question Id : 89040115504 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

27.2 mg of CaSO_4 and 2.4 mg of MgSO_4 are present in a 2 kg water sample.

What is the total hardness of water (in ppm) in terms of equivalents of CaCO_3 ?

(molecular weight of CaSO_4 = 136 & molecular weight of MgSO_4 = 120)

Options :

- 1. ✓ 11
- 2. ✗ 10
- 3. ✗ 20
- 4. ✗ 22

Question Number : 93 Question Id : 89040115505 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Statement I: The lower the pH greater is the corrosion

Statement II: Electrochemical Corrosion always occurs at the anodic area.

The correct answer is

Options :

- 1. ✓ Both statement – I and Statement – II are correct
- 2. ✗ Both statement – I and Statement – II are not correct
- 3. ✗ Statement – I is correct but statement – II is not correct
- 4. ✗ Statement – I is not correct but statement – II is correct

Question Number : 94 Question Id : 89040115506 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Rust is chemically

Options :

- 1. ✓ Hydrated Ferric Oxide

2. ✖ Hydrated Copper (II) Chloride

3. ✖ Hydrated Ferrous Sulphate

4. ✖ Hydrated Ferric Sulphate

Question Number : 95 Question Id : 89040115507 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The monomer of Teflon is X. The number of fluorine atoms in X is

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 1

Question Number : 96 Question Id : 89040115508 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Bakelite is an example of

Options :

1. ✖ Thermoplastic Polymer

2. ✖ Elastomer

3. ✖ Fibre

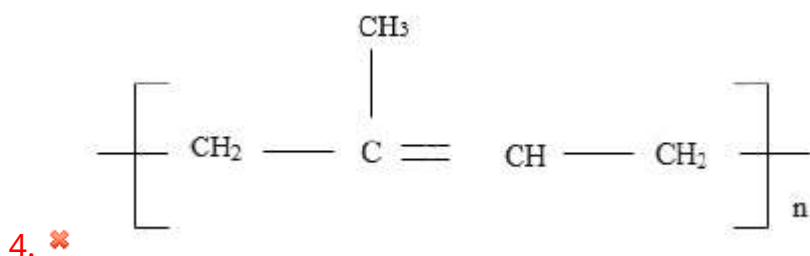
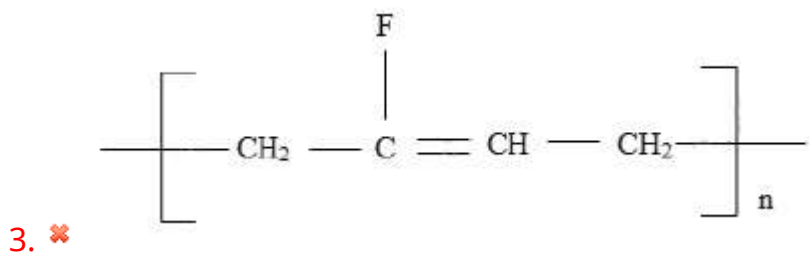
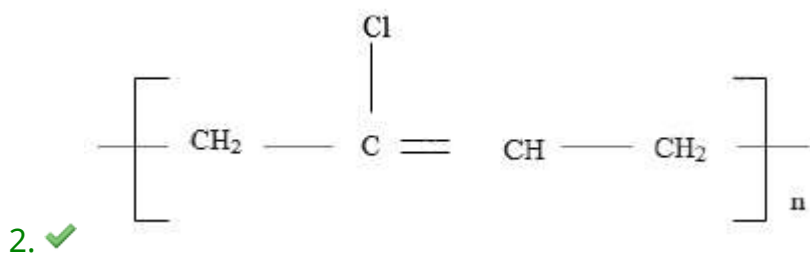
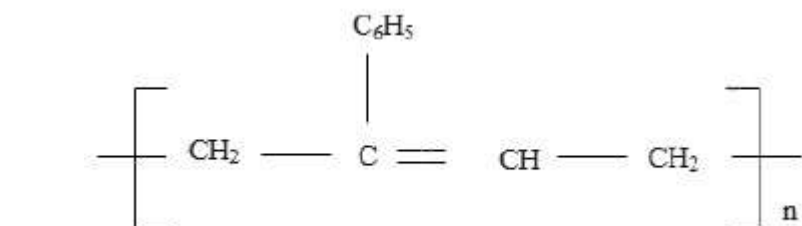
4. ✓ Thermosetting polymer

Question Number : 97 Question Id : 89040115509 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct structure of neoprene rubber is

Options :



Question Number : 98 Question Id : 89040115510 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT regarded as a primary fuel?

Options :

1. ✖ Natural gas
2. ✔ Coal gas
3. ✖ Lignite
4. ✖ Crude oil

Question Number : 99 Question Id : 89040115511 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

pH of acid rain water is generally in the range of

Options :

1. ✖ 1.0 - 3.0
2. ✔ 3.5 - 5.6
3. ✖ 5.9 - 6.9
4. ✖ 7.1 - 7.5

Question Number : 100 Question Id : 89040115512 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In _____ part of the atmosphere ozone layer is present.

Options :

1. ✖ Troposphere
2. ✖ Thermosphere

3. ✓ Stratosphere

4. ✗ Mesosphere

Metallurgical Engineering

Section Id :	890401306
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 :	890401330
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 89040115513 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The crushing efficiency of a crusher is the ratio of

Options :

1. ✗ energy absorbed by the solid to energy supplied to the crusher

2. ✗ energy supplied to the crusher to surface energy created by crushing

3. ✓ surface energy created by crushing to energy absorbed by the solid

4. ✗ surface energy created by crushing to energy supplied to the crusher

Question Number : 102 Question Id : 89040115514 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Grindability of a material does not depend upon its

Options :

1. ✓ size
2. ✗ toughness
3. ✗ elasticity
4. ✗ hardness

Question Number : 103 Question Id : 89040115515 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Copper deposits are found in India at the following location

Options :

1. ✗ Kolar
2. ✗ Kudremukh
3. ✓ Khetri
4. ✗ Jaipur

Question Number : 104 Question Id : 89040115516 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Electrochemical corrosion can occur only if _____ is present in contact with the metal.

Options :

1. ✗ air

- 2. ✖ oxygen
- 3. ✔ liquid medium
- 4. ✖ gaseous medium

Question Number : 105 Question Id : 89040115517 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Hoop's process is predominantly used for the electrolytic refining of

Options :

- 1. ✖ copper
- 2. ✖ tin
- 3. ✖ zinc
- 4. ✔ aluminium

Question Number : 106 Question Id : 89040115518 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In hydrometallurgical process of leaching of copper ore, _____ acid is used for the purpose.

Options :

- 1. ✖ nitric
- 2. ✖ acetic
- 3. ✔ sulphuric

4. ✖ hydrochloric

Question Number : 107 Question Id : 89040115519 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Fusion point of basic refractory material is

Options :

- 1. ✔ Reduced by the addition of acid oxides
- 2. ✖ Increased by addition of acid oxides
- 3. ✖ Not affected by the addition of acid oxides
- 4. ✖ Always less than 1000°C

Question Number : 108 Question Id : 89040115520 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Test piece for determining the RUL of a refractory brick is heated in

Options :

- 1. ✖ Oxidising atmosphere
- 2. ✖ Reducing atmosphere
- 3. ✖ Neutral atmosphere
- 4. ✔ Electric furnace

Question Number : 109 Question Id : 89040115521 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which is the most reactive fuel?

Options :

1. ✖ Anthracite
2. ✔ Low temperature coke
3. ✖ Blast furnace coke
4. ✖ Bituminous coal

Question Number : 110 Question Id : 89040115522 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Shatter Index of the coke is a measure of its

Options :

1. ✖ Reactivity
2. ✖ Bulk density
3. ✔ Strength
4. ✖ Hardness

Question Number : 111 Question Id : 89040115523 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Blast furnace gas is very poisonous due to its high

Options :

1. ✖ CO_2

2. ✔ CO

3. ✖ N_2

4. ✖ H_2S

Question Number : 112 Question Id : 89040115524 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At any temperature, thermodynamically stable phase is the one which has.

Options :

1. ✖ maximum free energy

2. ✔ maximum enthalpy

3. ✖ lowest free energy

4. ✖ lowest entropy

Question Number : 113 Question Id : 89040115525 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Activity of pure metal is

Options :

1. ✖ Zero
2. ✔ 1
3. ✖ -1
4. ✖ Depends on temperature

Question Number : 114 Question Id : 89040115526 Question Type : MCQ Option Shuffling : No
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

Van't Hoff equation is

Options :

1. ✖ $\frac{\partial x}{\partial T} = kC^n$
2. ✔ $\frac{\partial x}{\partial t} = -kC^n$
3. ✖ $\frac{\partial x}{\partial T} = kC$
4. ✖ $\frac{\partial x}{\partial t} = kC$

Question Number : 115 Question Id : 89040115527 Question Type : MCQ Option Shuffling : No
 Display Question Number : Yes
 Correct Marks : 1 Wrong Marks : 0

At zero absolute temperature, $\Delta G^0 =$

Options :

1. ✖ ΔS^0

2. ✖ $T * \Delta S^0$

3. ✔ ΔH^0

4. ✖ RT

Question Number : 116 Question Id : 89040115528 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

For an isothermal reversible compression of an ideal gas

Options :

1. ✖ only $\Delta E = 0$

2. ✖ only $\Delta H = 0$

3. ✔ $\Delta E = \Delta H = 0$

4. ✖ $dQ = dE$

Question Number : 117 Question Id : 89040115529 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Free energy change at equilibrium is

Options :

1. ✔ zero

2. ✖ positive

3. ✖ negative

4. ✖ indeterminate

Question Number : 118 Question Id : 89040115530 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Variation in equilibrium pressure with temperature for any two phases of a given substance is given by the _____ equation.

Options :

1. ✖ Gibbs – Duhem

2. ✖ Maxwell's

3. ✔ Clayperon

4. ✖ Margules

Question Number : 119 Question Id : 89040115531 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

With an increase in temperature, the equilibrium constant for an endothermic reaction

Options :

1. ✖ increases

2. ✔ decreases

3. ✖ increases linearly

4. ✖ remains unaffected

Question Number : 120 Question Id : 89040115532 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Allotropic forms of iron in sequence is

Options :

1. ✖ BCC alpha, HCP gamma and FCC gamma

2. ✔ BCC alpha, FCC gamma and BCC delta

3. ✖ FCC alpha, BCC delta and BCC gamma

4. ✖ FCC gamma, BCC alpha and HCP delta

Question Number : 121 Question Id : 89040115533 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The light source in optical microscope is

Options :

1. ✖ X – rays

2. ✔ Natural light

3. ✖ Electron beam

4. ✖ Gamma rays

Question Number : 122 Question Id : 89040115534 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

BCC crystal structure is exhibited by

Options :

1. ✓ Chromium
2. ✗ Copper
3. ✗ Magnesium
4. ✗ Titanium

Question Number : 123 Question Id : 89040115535 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Packing sequence of ABCABCAB.... is observed in

Options :

1. ✗ Simple cubic
2. ✗ Body centered cubic
3. ✓ Face centered cubic
4. ✗ Hexagonally close packed structure

Question Number : 124 Question Id : 89040115536 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Austenite phase in Fe – Fe₃C system exists in a temperature range of

Options :

1. ✖ 25 – 910⁰C
2. ✖ 710 – 1130⁰C
3. ✖ 910 – 1490⁰C
4. ✔ 723 – 1490⁰C

Question Number : 125 Question Id : 89040115537 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Etchant used for steels is

Options :

1. ✖ mixture of sodium thiocyanate and ammonium nitrate
2. ✔ mixture of nitric acid and ethyl alcohol
3. ✖ sodium picrate solution
4. ✖ mixture of ammonia and ferric chloride

Question Number : 126 Question Id : 89040115538 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Proeutectoid ferrite is observed in

Options :

1. ✔ Hypo eutectoid steels
2. ✖

Eutectoid steels

3. ✖ Hyper eutectoid steels

4. ✖ White cast irons

Question Number : 127 Question Id : 89040115539 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

High ductility is observed in

Options :

1. ✖ Gray cast iron

2. ✔ Nodular cast iron

3. ✖ Malleable cast iron

4. ✖ High carbon steel

Question Number : 128 Question Id : 89040115540 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Eutectoid steel contains

Options :

1. ✖ 0.008% C

2. ✖ 2.1% C

3. ✖ 0.18% C

4. ✔ 0.8% C

Question Number : 129 Question Id : 89040115541 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Zinc percentage in alpha – brass is

Options :

1. ✖ 0 – 50

2. ✖ 45 – 50

3. ✔ 0 – 36

4. ✖ above 58

Question Number : 130 Question Id : 89040115542 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Gun metal is an alloy of

Options :

1. ✔ Cu – Sn

2. ✖ Cu – Zn

3. ✖ Al – Cu

4. ✖ Al – Mn

Question Number : 131 Question Id : 89040115543 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Improvement of machinability in high carbon steel is obtained by

Options :

1. ✖ Full annealing
2. ✔ Spheroidizing annealing
3. ✖ Process annealing
4. ✖ Stress-relief annealing

Question Number : 132 Question Id : 89040115544 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Pearlite in a steel is formed from

Options :

1. ✖ Ferrite
2. ✖ Martensite
3. ✖ Cementite
4. ✔ Austenite

Question Number : 133 Question Id : 89040115545 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The product of diffusionless transformation is

Options :

1. ✓ Martensite
2. ✗ Pearlite
3. ✗ Bainite
4. ✗ Austenite

Question Number : 134 Question Id : 89040115546 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The characteristics of martensite formation does not include

Options :

1. ✗ Athermal transformation
2. ✗ No change in chemical composition
3. ✓ Nucleation and growth process
4. ✗ Martensite formation occurs in a range of temperature

Question Number : 135 Question Id : 89040115547 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Martensite in a mild steel is obtained by

Options :

1. ✗ Annealing

- 2. ✖ Normalising
- 3. ✖ Hardening
- 4. ✔ Martensite can not be formed

Question Number : 136 Question Id : 89040115548 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The nose region of I-T curve for eutectoid steel indicates the formation of

Options :

- 1. ✖ Martensite
- 2. ✖ Coarse pearlite
- 3. ✖ Bainite
- 4. ✔ Fine pearlite

Question Number : 137 Question Id : 89040115549 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Most efficient method of increasing the hardenability of the steel is

Options :

- 1. ✖ Increasing the cooling rate
- 2. ✖ Increasing the carbon content
- 3. ✖ Increasing the heating time

4. ✓ Adding alloying elements

Question Number : 138 Question Id : 89040115550 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The advantage of pack carburising is

Options :

1. ✗ Close control of surface carbon is possible

2. ✗ Suited for production of thin carburized cases

3. ✓ Prepared atmosphere is not required

4. ✗ Components can be directly quenched from carburizing temperature

Question Number : 139 Question Id : 89040115551 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Selected areas of the surface can be hardened by

Options :

1. ✗ Nitriding

2. ✓ Flame hardening

3. ✗ Induction hardening

4. ✗ Pack carburizing

Question Number : 140 Question Id : 89040115552 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Strong hardener of ferrite is

Options :

1. ✖ Chromium
2. ✖ Molybdenum
3. ✖ Nickel
4. ✔ Silicon

Question Number : 141 Question Id : 89040115553 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Nickel and manganese elements in steel _____ the critical temperature.

Options :

1. ✖ Raises
2. ✔ Lowers
3. ✖ Do not change
4. ✖ Raises and lowers

Question Number : 142 Question Id : 89040115554 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Precipitation hardening treatment is a _____ step process.

Options :

- 1. ✖ Single
- 2. ✔ Two
- 3. ✖ Three
- 4. ✖ Four

Question Number : 143 Question Id : 89040115555 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Bustle pipe is arranged to the blast furnace

Options :

- 1. ✖ for collection of blast furnace gas
- 2. ✖ for collection of flue dust
- 3. ✔ to supply the hot blast to the furnace with equal pressure
- 4. ✖ to discharge the hot metal to the ladles

Question Number : 144 Question Id : 89040115556 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Where an Integrated Steel Plant under public sector is located in Chhattisgarh state?

Options :

1. ✖ Rourkela
2. ✖ Visakhapatnam
3. ✖ Durgapur
4. ✔ Bhilai

Question Number : 145 Question Id : 89040115557 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the direct reduction reaction of iron ore in blast furnace:

Options :

1. ✔ $\text{Fe}_2\text{O}_3 + 3\text{C} = 3\text{CO} + 2\text{Fe}$
2. ✖ $\text{Fe}_2\text{O}_3 + 3\text{CO} = 3\text{CO}_2 + 4\text{Fe}$
3. ✖ $3\text{FeO} + \text{CO}_2 = \text{Fe}_3\text{O}_4 + \text{CO}$
4. ✖ $3\text{Fe}_2\text{O}_3 + \text{CO} = 2\text{Fe}_3\text{O}_4 + \text{CO}_2$

Question Number : 146 Question Id : 89040115558 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In sponge iron technology, the percentage of iron as part of the whole iron existing as metallic iron is called _____.

Options :

1. ✖ Degree of reduction

2. ✓ Degree of metallisation

3. ✗ Percentage reduction

4. ✗ Degree of oxidation

Question Number : 147 Question Id : 89040115559 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

A large mass that gets stuck to the blast furnace wall leads to

Options :

1. ✓ increase in fuel consumption

2. ✗ chilling of the hearth

3. ✗ failure of the bosh walls

4. ✗ choking of gas offtakes

Question Number : 148 Question Id : 89040115560 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Where does the maximum temperature is generated in a 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 : 149 Question Id : 89040115561 Question Type : MCQ Option Shuffling : No
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 : 150 Question Id : 89040115562 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the Boudouard equilibrium reaction from the following:

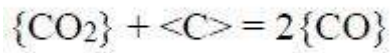
Options :

1. ✗ $\langle C \rangle + \{O_2\} = \{CO_2\}$

2. ✗ $2\langle C \rangle + \{O_2\} = 2\{CO\}$

3. ✗ $\langle Fe \rangle + \{CO_2\} = \langle FeO \rangle + \{CO\}$

4. ✓



Question Number : 151 Question Id : 89040115563 Question Type : MCQ Option Shuffling : No 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 : 152 Question Id : 89040115564 Question Type : MCQ Option Shuffling : No 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 : 153 Question Id : 89040115565 Question Type : MCQ Option Shuffling : No
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 : 154 Question Id : 89040115566 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

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

Options :

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

Question Number : 155 Question Id : 89040115567 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following statements regarding Kroll's process is incorrect?

Options :

1. ✓ Reduction is done only by sodium
2. ✗ Reduction chamber should be free of oxygen
3. ✗ It is used for extraction of titanium and zirconium
4. ✗ Pure metal chloride serves as main raw material

Question Number : 156 Question Id : 89040115568 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The products of roasting a sulphide ore is (are)

Options :

1. ✓ oxide only
2. ✗ sulphate only
3. ✗ oxide and sulphate
4. ✗ dependent on temperature and partial pressures of oxygen and sulphur dioxide

Question Number : 157 Question Id : 89040115569 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Refining of silver is done by

Options :

1. ✖ Liquation
2. ✔ Cupellation

3. ✖ Poling

4. ✖ Van Arkel method

Question Number : 158 Question Id : 89040115570 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Complete precipitation of $\text{Al}(\text{OH})_3$ from sodium aluminate in settling tank (in Bayer's process) takes about _____ hours.

Options :

1. ✖ 2
2. ✖ 35
3. ✔ 60
4. ✖ 72

Question Number : 159 Question Id : 89040115571 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Leaching of ore is done in the _____ method of metal extraction.

Options :

1. ✖ pyrometallurgical
2. ✔

hydrometallurgical

3. ✖ electrometallurgical

4. ✖ either pyrometallurgical or hydrometallurgical

Question Number : 160 Question Id : 89040115572 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Low specific gravity of slag is desirable mainly due to the fact that, it

Options :

1. ✖ is more fusible

2. ✖ makes the slag more fluid

3. ✔ permits clean and better separation from metal/matte

4. ✖ protects the metal from overheating due to poor conductivity

Question Number : 161 Question Id : 89040115573 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Desirable percentage of copper in matte resulting from smelting of sulphide ore of copper is about

Options :

1. ✖ 10

2. ✖ 30

3. ✔

40

4. ✖ 80

Question Number : 162 Question Id : 89040115574 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Purity of copper produced by fire refining is about _____ percent.

Options :

1. ✔ 99.3

2. ✖ 99.9

3. ✖ 98.7

4. ✖ 97.3

Question Number : 163 Question Id : 89040115575 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Main impurities in bauxite are

Options :

1. ✔ Fe_2O_3 , SiO_2 and TiO_2

2. ✖ CaO , MgO and SiO_2

3. ✖ FeO , CaO and MgO

4. ✖ CaSiO_3 , MgSiO_3 and SiO_2

Question Number : 164 Question Id : 89040115576 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Recovery of zinc from its ore is about _____ percent.

Options :

1. ✖ 96 – 98
2. ✖ 74 – 76
3. ✖ 60 – 62
4. ✔ 38 – 40

Question Number : 165 Question Id : 89040115577 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Identify the structure-sensitive property:

Options :

1. ✖ Density
2. ✔ Yield stress
3. ✖ Specific heat
4. ✖ Coefficient of thermal expansion

Question Number : 166 Question Id : 89040115578 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Projected area rather than surface area of the indentation is used in

Options :

1. ✖ Brinell test
2. ✖ Rockwell test
3. ✖ Vickers test
4. ✔ Meyer test

Question Number : 167 Question Id : 89040115579 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The fracture occurred during the crack propagation along the grain boundaries is called

Options :

1. ✔ Inter granular fracture
2. ✖ Transgranular fracture
3. ✖ Ductile fracture
4. ✖ Brittle fracture

Question Number : 168 Question Id : 89040115580 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Units for stress are

Options :

1. ✓ MPa
2. ✗ Pa/m²
3. ✗ Kg/m
4. ✗ No units

Question Number : 169 Question Id : 89040115581 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Modulus of elasticity is a measure of

Options :

1. ✗ True stress
2. ✗ Toughness
3. ✓ Stiffness
4. ✗ Resilience

Question Number : 170 Question Id : 89040115582 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Creep rate decreasing with time is observed during

Options :

1. ✖ Viscous creep
2. ✖ Primary creep
3. ✔ Transient creep
4. ✖ Initial stages of creep test

Question Number : 171 Question Id : 89040115583 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Beach marks are observed in

Options :

1. ✖ Impact failure
2. ✖ Tensile failure
3. ✖ Shear failure
4. ✔ Fatigue failure

Question Number : 172 Question Id : 89040115584 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Pre-cracked specimens are used in the Instrumented Charpy test to measure its

Options :

1. ✖ Toughness

2. ✓ Dynamic fracture toughness

3. ✗ Transition temperature

4. ✗ Compressive strength

Question Number : 173 Question Id : 89040115585 Question Type : MCQ Option Shuffling : No
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 : 89040115586 Question Type : MCQ Option Shuffling : No
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. ✗

$$\Phi = 45^0, \lambda = 60^0$$

3. ✖ $\Phi = 30^0, \lambda = 45^0$

4. ✖ $\Phi = \lambda = 60^0$

Question Number : 175 Question Id : 89040115587 Question Type : MCQ Option Shuffling : No 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 : 176 Question Id : 89040115588 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

By _____ processes the volume and mass of metal are conserved and the metal is displaced from one location to another.

Options :

1. ✖ Elastic deformation

2. ✔ Plastic deformation

3. ✖ Elasto-plastic deformation

4. ✖ Heat Treatment

Question Number : 177 Question Id : 89040115589 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In three - high rolling mill, _____ rotates by friction.

Options :

1. ✖ Upper roll

2. ✔ Middle roll

3. ✖ Lower roll

4. ✖ Middle roll and lower roll

Question Number : 178 Question Id : 89040115590 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Cold forming of a part has the advantage of

Options :

1. ✔ close tolerance as no shrinkage occurs

2. ✖ application of lower deforming forces

3. ✖

grain refinement

elimination of post heat treatment requirement

4. ✖

Question Number : 179 Question Id : 89040115591 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At _____ temperature, the grains and grain boundaries have equal strength.

Options :

1. ✖ Curie

2. ✖ Absolute zero

3. ✖ Melting temperature

4. ✔ equi-cohesive

Question Number : 180 Question Id : 89040115592 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In hot rolling of metal

Options :

1. ✖ grain refinement is not possible

2. ✔ surface finish is not very good

3. ✖ annealing operation is a must

4. ✖

electrical power requirement is very high.

Question Number : 181 Question Id : 89040115593 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Forging of plane carbon steel is carried out at _____ °C.

Options :

1. ✓ 1300
2. ✗ 1200
3. ✗ 1400
4. ✗ 1050

Question Number : 182 Question Id : 89040115594 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

A material used for extrusion purpose must possess the following mechanical property:

Options :

1. ✗ Ductility
2. ✗ Elasticity
3. ✓ Plasticity
4. ✗ Brittleness

Question Number : 183 Question Id : 89040115595 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The impurities in centrifugal casting are

Options :

1. ✖ forced outside the surface
2. ✔ collected in the centre of casting
3. ✖ present in the middle section of casting
4. ✖ do not enter into the casting

Question Number : 184 Question Id : 89040115596 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Wood flour is added to the moulding sand to improve

Options :

1. ✔ collapsibility
2. ✖ green strength
3. ✖ permeability
4. ✖ hot strength

Question Number : 185 Question Id : 89040115597 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

An expandable pattern is used in

Options :

1. ✖ Shell moulding
2. ✖ Squeeze casting
3. ✖ Centrifugal casting
4. ✔ Investment casting

Question Number : 186 Question Id : 89040115598 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The riser is designed such that the melt in the riser solidifies

Options :

1. ✔ After casting solidifies
2. ✖ Before casting solidifies
3. ✖ At the same time as casting solidifies
4. ✖ Irrespective of the solidification of the casting

Question Number : 187 Question Id : 89040115599 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

In a casting, shrinkage occurs

Options :

1. ✓ only during transformation from liquid to solid
2. ✗ only after transformation from liquid solid
3. ✗ before, during after transformation from liquid to solid
4. ✗ only when the metal is in liquid state

Question Number : 188 Question Id : 89040115600 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following is not a casting defect?

Options :

1. ✗ Fin
2. ✗ Scab
3. ✓ Ingate
4. ✗ Hot tear

Question Number : 189 Question Id : 89040115601 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

The molten metal is forced into mould under high pressure in a _____ casting method.

Options :

1. ✓ die

2. ✖ slush

3. ✖ centrifugal

4. ✖ permanent mould

Question Number : 190 Question Id : 89040115602 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The top most part in sand moulding is called

Options :

1. ✖ drag

2. ✖ cheek

3. ✔ cope

4. ✖ core

Question Number : 191 Question Id : 89040115603 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Draft or taper allowances are provided in patterns on all the _____ of the pattern.

Options :

1. ✖ horizontal surfaces

2. ✖ sides and round surfaces

3. ✔

vertical surfaces

4. ✖ corners

Question Number : 192 Question Id : 89040115604 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

The grain size of moulding sand is expressed in terms of

Options :

1. ✖ grain density

2. ✖ sieve number

3. ✖ average grain diameter

4. ✔ grain fineness number

Question Number : 193 Question Id : 89040115605 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0

Limitations of thermit welding is

Options :

1. ✔ applicable only to ferrous metal parts of heavy sections

2. ✖ heat necessary for welding is obtained from a chemical reaction

3. ✖ No flux or separate shielding gas is used

4. ✖

as the energy input is in a narrow concentrated beam, distortion is almost eliminated

Question Number : 194 Question Id : 89040115606 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The protective gaseous atmosphere around the arc and weld pool in the case of arc welding is due to

Options :

1. ✓ vaporisation of electrode metal
2. ✗ burning of flux
3. ✗ formation of metal vapors
4. ✗ for fast cooling of weld joint

Question Number : 195 Question Id : 89040115607 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Function of a flux in brazing is to

Options :

1. ✗ prevent oxide formation both on base metal and brazing material
2. ✓ avoid thermal distortion and cracking
3. ✗ dissolve surface oxide coating formed prior to brazing
4. ✗ facilitate the wetting by reducing the viscosity of the melt

Question Number : 196 Question Id : 89040115608 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

TIG is especially useful in welding

Options :

1. ✖ cast iron
2. ✖ titanium
3. ✖ stainless steel
4. ✔ aluminium

Question Number : 197 Question Id : 89040115609 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

“Cold cracking” in the heat affected zone of a high strength steel weld can take place because of

Options :

1. ✔ martensite formation
2. ✖ retained austenite
3. ✖ sufficiently hydrogen present in the welding arc
4. ✖ relatively high sulfur content in the base metal

Question Number : 198 Question Id : 89040115610 Question Type : MCQ Option Shuffling : No
Display Question Number : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following causes excessive splatter, fiery arc, spalling of flux coating and porosity in weld metal?

Options :

1. ✖ Low voltage
2. ✖ Loose electrical connection
3. ✖ Defective welding machine
4. ✔ Moisture absorption by the electrode

Question Number : 199 Question Id : 89040115611 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Temperature attained in soldering of metals is about

Options :

1. ✖ $750 - 1000^{\circ}\text{C}$
2. ✖ $500 - 750^{\circ}\text{C}$
3. ✔ $150 - 300^{\circ}\text{C}$
4. ✖ $1000 - 1250^{\circ}\text{C}$

Question Number : 200 Question Id : 89040115612 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the type of arc welding processes:

Options :

1. ✖

Electron beam welding

2. ✖ Laser beam welding

3. ✖ Thermit welding

4. ✔ Electro slag welding