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
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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)≥deg g(x), then the rational fraction $f(x)/g(x)$ 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

$\text{Sin } 15^0 =$

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 ΔABC, $\tan\frac{B+C}{2} =$

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

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 $\sin 45^0$ 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

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

Options :

1. ✖ $\frac{1}{2}+\mathrm{i}$

2. ✖ $-\frac{1}{2}-\mathrm{i}$

3. ✔ $-\frac{1}{2}+\mathrm{i}$

4. ✖ $\frac{1}{2}\pm\mathrm{i}$

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

Correct Marks : 1 Wrong Marks : 0

For any real θ, $(\cos\theta+i\sin\theta)(\cos\theta-i\sin\theta)=$

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

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

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 $u(x,y) = \mathrm{Sin}^{-1}\frac{x}{y} + \mathrm{Tan}^{-1}\frac{y}{x}$ 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. ✗ $\log\left|x + \sqrt{x^2 + a^2}\right| + c$

2. ✗ $\log\left|x + \sqrt{x^2 - a^2}\right| + c$

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. ✖ $c_1e^{2x} + e^x\{c_2\cos(x\sqrt{3}) + c_3\sin x\sqrt{3}\}$

2. ✖ $c_1e^{2x} + e^{-x}(\cos\sqrt{3} + \sin\sqrt{3})$

3. ✖ $c_1e^{-2x} + c_2e^{-x} + c_3\cos x$

4. ✔ $c_1e^{2x} + e^{-x}\{c_2\cos(x\sqrt{3}) + c_3\sin(x\sqrt{3})\}$

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

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

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

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

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. ✖ $^1/_{60}$

2. ✖ 60

3. ✔ $^1/_{3600}$

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 $|\vec{A} \times \vec{B}| = \sqrt{3}\,\vec{A}\,.\,\vec{B}$ 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

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

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? [$g = 10\ m/s^2$].

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. ✔ 6.67×10^{-23} gm

2. ✖ 6.67×10^{23} gm

3. ✖ 2×10^{-23} gm

4. ✖ 2×10^{23} 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 = 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. ✗ m_l

3. ✗

m_s

4. ✗ n

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 x 10^{23} mol^{-1})

Options :

1. ✖ 1.43 X 10^{23}

2. ✖ 2.85 X 10^{23}

3. ✔ 2.85 X 10^{24}

4. ✖ 1.85 X 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. ✔ $H_2C_2O_4.2H_2O$ (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 25^0C, ionic product (Kw) of 0.01M HCl solution is

Options :

1. ✖ 1.0×10^{-13} mol^2/L^2

2. ✖ 1.0×10^{-12} mol^2/L^2

3. ✔ 1.0×10^{-14} mol^2/L^2

4. ✖ 1.0×10^{-15} mol^2/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. ✖ HCl + NaCl

2. ✔ $CH_3COOH + CH_3COONa$

3. ✖ $CH_3COOH + NaCl$

4. ✖ $NH_4OH + NaOH$

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 (Cl = 35.5 u) (1F=96500 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?

$Sn|Sn^{2+}\,(1M)||Ag^{+}\,(1M)|Ag$

[Given $E^{0}_{Sn^{2+}|Sn} = -0.14V$ *and* $E^{0}_{Ag^{+}|Ag} = +0.80\,V$]

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

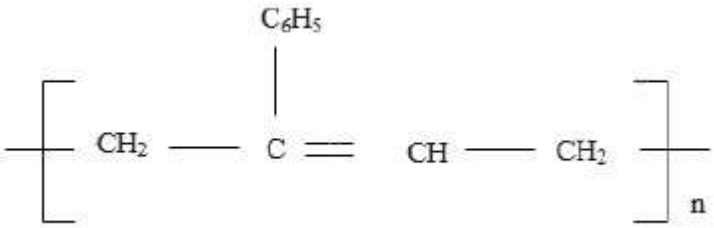
4. ✔ Thermosetting polymer

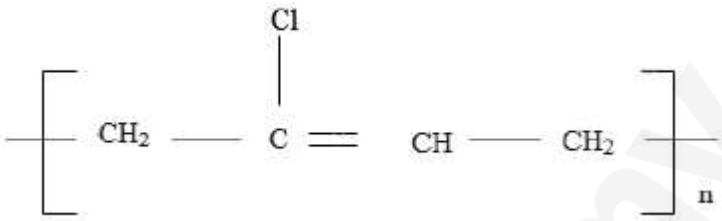
Question Number : 97 Question Id : 89040115509 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

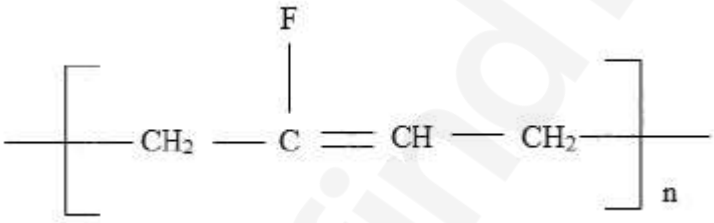
Correct Marks : 1 Wrong Marks : 0

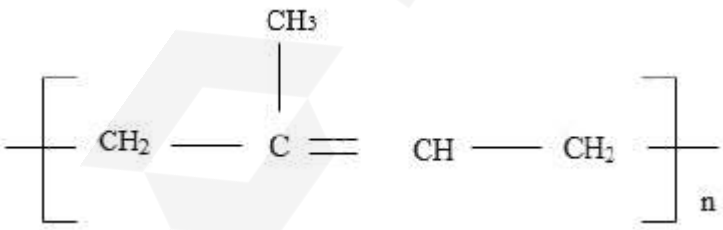
The correct structure of neoprene rubber is

Options :

1. ✖ 

2. ✔ 

3. ✖ 

4. ✖ 

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 – Fe_3C system exists in a temperature range of

Options :

1. ✖ $25 - 910^0C$

2. ✖ $710 - 1130^0C$

3. ✖ $910 - 1490^0C$

4. ✔ $723 - 1490^0C$

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. ✔ $<Fe_2O_3> + 3\{C\} = 3\{CO\} + 2<Fe>$

2. ✖ $<Fe_2O_3> + 3\{CO\} = 3\{CO_2\} + 4<Fe>$

3. ✖ $3<FeO> + \{CO_2\} = <Fe_3O_4> + \{CO\}$

4. ✖ $3<Fe_2O_3> + \{CO\} = 2<Fe_3O_4> + \{CO_2\}$

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. ✖ $<C> + \{O_2\} = \{CO_2\}$

2. ✖ $2<C> + \{O_2\} = 2\{CO\}$

3. ✖ $<Fe> + \{CO_2\} = <FeO> + \{CO\}$

4. ✔

$\{CO_2\} + <C> = 2\{CO\}$

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 $Al(OH)_3$ 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/m^2

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. ✔ $\Phi = \lambda = 45^0$

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 _____ ^{0}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 entre 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 tapper 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. ✖ $750 - 1000^0C$

2. ✖ $500 - 750^0C$

3. ✔ $150 - 300^0C$

4. ✖ $1000 - 1250^0\ C$

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