

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.

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|--|---|
| Question Paper Name : | Metallurgical Engineering 20th June 2023 Shift 2 |
| Duration : | 180 |
| Total Marks : | 200 |
| Display Marks: | No |
| Share Answer Key With Delivery Engine : | Yes |
| Calculator : | None |
| Magnifying Glass Required? : | No |
| Ruler Required? : | No |
| Eraser Required? : | No |
| Scratch Pad Required? : | No |
| Rough Sketch/Notepad Required? : | No |
| Protractor Required? : | No |
| Show Watermark on Console? : | Yes |
| Highlighter : | No |
| Auto Save on Console? | Yes |
| Change Font Color : | No |
| Change Background Color : | No |
| Change Theme : | No |
| Help Button : | No |
| Show Reports : | No |

| | |
|-------------------------------|-----------|
| Show Progress Bar : | No |
| Is this Group for Examiner? : | No |
| Examiner permission : | Cant View |
| Show Progress Bar? : | No |

Mathematics

| | |
|--|-----------|
| Section Id : | 418099388 |
| Section Number : | 1 |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 50 |
| Section Marks : | 50 |
| Enable Mark as Answered Mark for Review and Clear Response : | Yes |
| Maximum Instruction Time : | 0 |
| Is Section Default? : | null |

Question Number : 1 Question Id : 41809919403 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A \begin{bmatrix} 0 & 1 \\ 2 & -1 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$, where A is a square matrix of order 2 then A =

Options :

1. ✘ $\begin{bmatrix} 2 & 1 \\ 0 & 0 \end{bmatrix}$

2. ✘ $\begin{bmatrix} 0 & 1 \\ 2 & -1 \end{bmatrix}$

3. ✘ $\begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$

4. ✔ $\begin{bmatrix} 2 & 1 \\ -1/2 & -1/2 \end{bmatrix}$

Question Number : 2 Question Id : 41809919404 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the matrix $A = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$ is expressed as the sum of a symmetric and a skew symmetric. Then the symmetric matrix is

Options :

1. ✘ $\begin{bmatrix} 2 & 1 \\ 2 & 4 \end{bmatrix}$

2. ✘ $\begin{bmatrix} 2 & 4 \\ 4 & 1 \end{bmatrix}$

3. ✔ $\begin{bmatrix} 2 & 4 \\ 4 & -1 \end{bmatrix}$

4. ✘ $\begin{bmatrix} 4 & 2 \\ 2 & -1 \end{bmatrix}$

Question Number : 3 Question Id : 41809919405 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If A is any square matrix of order n , then $|adj A|$ is equal to

Options :

1. ✓ $|A|^{n-1}$

2. ✗ $|A|^n$

3. ✗ $|A|$

4. ✗ $\frac{1}{|A|}$

Question Number : 4 Question Id : 41809919406 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A - B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$, $A + B = \begin{bmatrix} 3 & 4 \\ 2 & 5 \end{bmatrix}$ then $AB =$

Options :

1. ✓ $\begin{bmatrix} 4 & 10 \\ 3 & 8 \end{bmatrix}$

2. ✗ $\begin{bmatrix} 4 & 3 \\ 10 & 8 \end{bmatrix}$

3. ✗ $\begin{bmatrix} 4 & -10 \\ -3 & 8 \end{bmatrix}$

4. ✗ $\begin{bmatrix} 4 & 10 \\ -3 & 8 \end{bmatrix}$

Question Number : 5 Question Id : 41809919407 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of the $\begin{vmatrix} 265 & 240 & 219 \\ 240 & 225 & 198 \\ 219 & 198 & 181 \end{vmatrix}$ is

Options :

1. ✘ -1

2. ✔ 0

3. ✘ 2

4. ✘ 1

Question Number : 6 Question Id : 41809919408 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{x+4}{(x^2-4)(x+1)} = \frac{A}{(x-2)} + \frac{B}{(x+2)} + \frac{C}{(x+1)}$ then $A + B - C =$

Options :

1. ✘ -1

2. ✘ 0

3.

✓ 2

4. ✘ 1

Question Number : 7 Question Id : 41809919409 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{x^2 - 10x + 1}{(x^2 - 5x + 6)(x - 1)} = \frac{A}{(x - 1)} + \frac{B}{(x - 2)} + \frac{-4}{(x - 3)}$ then A + B

Options :

1. ✘ -2

2. ✘ 3

3. ✓ 5

4. ✘ 4

Question Number : 8 Question Id : 41809919410 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\frac{\sec x + 1 - \tan x}{\tan x - \sec x + 1} =$

Options :

1. ✘ $\frac{1 - \cos x}{\sin x}$

2. ✓ $\frac{1 + \cos x}{\sin x}$

3. ✗ $\frac{1 + \sin x}{\cos x}$

4. ✗ $\frac{1 - \sin x}{\cos x}$

Question Number : 9 Question Id : 41809919411 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The least value of $2 \sin^2 \theta + 3 \cos^2 \theta$ is

Options :

1. ✗ 1

2. ✓ 2

3. ✗ 3

4. ✗ 5

Question Number : 10 Question Id : 41809919412 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

The value of $\tan 10^\circ + \tan 70^\circ - \tan 50^\circ$ is

Options :

1. ✘ $-\sqrt{3}$

2. ✔ $\sqrt{3}$

3. ✘ $\frac{1}{\sqrt{2}}$

4. ✘ $-\frac{1}{\sqrt{2}}$

Question Number : 11 Question Id : 41809919413 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\tan 3A - \tan 2A - \tan A$ is equal to

Options :

1. ✔ $\tan 3A \tan 2A \tan A$

2. ✘ $-\tan 3A \tan 2A \tan A$

3. ✘ $\tan A \tan 2A - \tan 2A \tan 3A - \tan 3A \tan A$

4. ✘ $\tan A \tan 2A + \tan 2A \tan 3A - \tan 3A \tan A$

Question Number : 12 Question Id : 41809919414 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\sin \frac{\pi}{14} \sin \frac{3\pi}{14} \sin \frac{5\pi}{14}$ is

Options :

1. ✘ $\frac{1}{16}$

2. ✔ $\frac{1}{8}$

3. ✘ $\frac{1}{2}$

4. ✘ 1

Question Number : 13 Question Id : 41809919415 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\tan^2 \theta + \sec \theta = 5$ then the value of $\cos \theta$ is

Options :

1. ✔ $-\frac{1}{3}$ or $\frac{1}{2}$

2. ✘ $\frac{-11}{12}$ or $\frac{1}{2}$

3. ✘ $\frac{13}{12}$ or $\frac{1}{3}$

4. ✘ $\frac{5}{4}$ or $\frac{1}{2}$

Question Number : 14 Question Id : 41809919416 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of solutions of the equation $\tan x + \sec x = 2 \cos x$ lying in the interval $[0, 2\pi]$ is

Options :

1. ✘ 0

2. ✘ 1

3. ✘ 2

4. ✔ 3

Question Number : 15 Question Id : 41809919417 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

If $\cos \theta = \frac{1}{2} \left(a + \frac{1}{a} \right)$ then $\cos 3\theta = K \left(a^3 + \frac{1}{a^3} \right)$ where K is equal to

Options :

1. ✓ $\frac{1}{2}$

2. ✗ $-\frac{1}{2}$

3. ✗ 1

4. ✗ $\frac{3}{2}$

Question Number : 16 Question Id : 41809919418 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\sin \theta + \sin 3\theta + \sin 5\theta = 0, 0 \leq \theta \leq \frac{\pi}{2}$ then $\theta =$

Options :

1. ✓ $0, \frac{\pi}{3}$

2. ✗ $0, \frac{\pi}{2}$

3. ✗ $1, \frac{\pi}{2}$

4. ✘ $2, \frac{\pi}{3}$

Question Number : 17 Question Id : 41809919419 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\sin^{-1} \frac{12}{13} + \cos^{-1} \frac{4}{5} + \tan^{-1} \frac{63}{16}$ is

Options :

1. ✘ $-\pi$

2. ✔ π

3. ✘ $\tan^{-1} \frac{4}{5}$

4. ✘ $-\tan^{-1} \frac{4}{5}$

Question Number : 18 Question Id : 41809919420 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $2 + i\sqrt{3}$ is a root of the equation $x^2 + px + q = 0$ where p and q are real, the $(p, q) =$

Options :

1. ✘ $(-3, 7)$

2. ✘ (-4, 9)

3. ✔ (-4, 7)

4. ✘ (-3, 9)

Question Number : 19 Question Id : 41809919421 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $i^2 + i^4 + i^6 + \dots (2n + 1) \text{ terms} =$

Options :

1. ✘ 1

2. ✔ -1

3. ✘ 0

4. ✘ i

Question Number : 20 Question Id : 41809919422 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The locus of the point equidistant from the points (a, b) and (b, a) is ____

Options :

1. ✘ $bx - ay = 0$

2. ✘ $bx + ay = 0$

3. ✘ $ax - by = 0$

4. ✔ $x - y = 0$

Question Number : 21 Question Id : 41809919423 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The point $(-1,0)$ lies on the circle $x^2 + y^2 - 4x + 8y + k = 0$. The radius of the circle is

Options :

1. ✘ 4

2. ✔ 5

3. ✘ 3

4. ✘ 2

Question Number : 22 Question Id : 41809919424 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equation of the circle whose centre is the point (1, -3) and touches the line $2x - y - 4 = 0$ is

Options :

1. ✘ $x^2 + y^2 - 4x + 8y + \frac{49}{5} = 0$

2. ✘ $x^2 + y^2 - 2x + 8y + \frac{49}{5} = 0$

3. ✔ $x^2 + y^2 - 2x + 6y + \frac{49}{5} = 0$

4. ✘ $x^2 + y^2 + 2x + 6y + \frac{49}{5} = 0$

Question Number : 23 Question Id : 41809919425 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The line $y = mx + 1$ is a tangent to the parabola $y^2 = 4x$ if

Options :

1. ✔ $m = 1$

2. ✘ $m = 2$

3. ✘ $m = 3$

4. ✘ $m = 4$

Question Number : 24 Question Id : 41809919426 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The angle between the tangents drawn from the origin to the parabola $y^2 = 4a(x - a)$ is

Options :

1. ✘ 30°

2. ✘ 45°

3. ✘ 60°

4. ✔ 90°

Question Number : 25 Question Id : 41809919427 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of the latus rectum and eccentricity of the ellipse $25x^2 + 16y^2 = 400$ is

Options :

1. ✔ $\left(\frac{32}{5}, \frac{3}{5}\right)$

2. ✘

$$\left(\frac{32}{5}, \frac{-3}{5}\right)$$

3. ✘ $\left(\frac{-32}{5}, \frac{3}{5}\right)$

4. ✘ $\left(\frac{-32}{5}, \frac{-3}{5}\right)$

Question Number : 26 Question Id : 41809919428 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = \tan^{-1} \frac{\cos x}{1 + \sin x}$ then $\frac{dy}{dx} =$

Options :

1. ✘ $\frac{1}{2}$

2. ✔ $\frac{-1}{2}$

3. ✘ 0

4. ✘ 1

Question Number : 27 Question Id : 41809919429 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = 10^{\log \sin x} + \tan^{-1}(\sqrt{x})$ then $\frac{dy}{dx} =$

Options :

1. ✓ $10^{\log \sin x} \log_e 10 \cot x + \frac{1}{2\sqrt{x}} \operatorname{sech}^2(\sqrt{x})$

2. ✗ $10^{\log \sin x} \log_e 10 \cot x - \frac{1}{2\sqrt{x}} \operatorname{sech}^2(\sqrt{x})$

3. ✗ $10^{\log \sin x} \log_e 10 \tan x + \frac{1}{2\sqrt{x}} \operatorname{sech}^2(\sqrt{x})$

4. ✗ $10^{\log \sin x} \log_e 10 \tan x - \frac{1}{2\sqrt{x}} \operatorname{sech}^2(\sqrt{x})$

Question Number : 28 Question Id : 41809919430 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = \begin{cases} 3^x \cdot 4, & \text{for } x < 0 \\ 2a + x, & \text{for } x \geq 0 \end{cases}$ is continuous at $x = 0$ then $a =$

Options :

1. ✗ 0

2. ✓ 2

3. ✗ 1

4. ✗ 3

Question Number : 29 Question Id : 41809919431 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x = a(\cos \theta + \theta \sin \theta)$, $y = a(\sin \theta - \theta \cos \theta)$ then the value of

$$\frac{dy}{dx} \text{ at } \theta = \frac{\pi}{4} \text{ is}$$

Options :

1. ✘ 0

2. ✘ $\frac{1}{\sqrt{3}}$

3. ✔ 1

4. ✘ $\sqrt{3}$

Question Number : 30 Question Id : 41809919432 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = \frac{x^3+y^3}{x-y}$ and if $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = ku$, then $k = \underline{\hspace{2cm}}$

Options :

1. ✘ 3

2. ✘ -3

3. ✓ 2

4. ✗ -1

Question Number : 31 Question Id : 41809919433 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum value of $\frac{\log x}{x}$, $0 < x < \infty$ is

Options :

1. ✗ e

2. ✓ $\frac{1}{e}$

3. ✗ 1

4. ✗ $e + 1$

Question Number : 32 Question Id : 41809919434 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum value of the function $2x^3 - 3x^2 - 12x + 4$ is

Options :

1. ✘ 13

2. ✘ 12

3. ✔ 11

4. ✘ 10

Question Number : 33 Question Id : 41809919435 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = f(x + ay) + g(x - ay)$, then $\frac{\partial^2 u}{\partial y^2}$ is equal to

Options :

1. ✘ $\frac{\partial^2 u}{\partial x^2}$

2. ✘ $a \frac{\partial^2 u}{\partial x^2}$

3. ✔ $a^2 \frac{\partial^2 u}{\partial x^2}$

4. ✘ $\frac{\partial^2 u}{\partial x \partial y}$

Question Number : 34 Question Id : 41809919436 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the curves $y^2 = 4(x + 1)$ and $y^2 = k(9 - x)$ cut orthogonally at $(1, 1)$, then $k =$

Options :

1. ✓ 1

2. ✗ -1

3. ✗ 2

4. ✗ 9

Question Number : 35 Question Id : 41809919437 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The stationary point and the corresponding stationary value of the function

$$f(x) = x^3 - 3x^2 - 9x + 22 \text{ is}$$

Options :

1. ✗ $(1, 27)$

2. ✓ $(-1, 27)$

3. ✗ $(-1, 29)$

4. ✗ $(-1, 25)$

Question Number : 36 Question Id : 41809919438 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int e^x \left(\frac{2 + \sin 2x}{1 + \cos 2x} \right) dx =$$

Options :

1. ✘ $e^x \sec x + c$

2. ✔ $e^x \tan x + c$

3. ✘ $e^x \cot x + c$

4. ✘ $e^x \operatorname{cosec} x + c$

Question Number : 37 Question Id : 41809919439 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int_0^{\pi} \frac{1}{5+4 \cos x} dx =$$

Options :

1. ✘ $\frac{\pi}{2}$

2. ✔ $\frac{\pi}{3}$

3. ✘ $\frac{\pi}{4}$

4. ✘ π

Question Number : 38 Question Id : 41809919440 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of the arc of the curve $y = \log \sec x$ from $x = 0$ to $x = \frac{\pi}{3}$ is

Options :

1. ✔ $\log(2 + \sqrt{3})$

2. ✘ $\log(2 - \sqrt{3})$

3. ✘ $\log(1 + \sqrt{3})$

4. ✘ $\log(1 - \sqrt{3})$

Question Number : 39 Question Id : 41809919441 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\int_1^4 \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) dx$ is

Options :

1. ✓ $\frac{20}{3}$

2. ✗ $-\frac{20}{3}$

3. ✗ $\frac{10}{3}$

4. ✗ $\frac{15}{3}$

Question Number : 40 Question Id : 41809919442 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\int \frac{1}{e^x + e^{-x}} dx =$$

Options :

1. ✗ $\log(e^x + e^{-x}) + C$

2. ✓ $\tan^{-1}e^x + C$

3. ✗ $\frac{1}{e^x + e^{-x}} + C$

4. ✗ $\cot^{-1}e^x + C$

Question Number : 41 Question Id : 41809919443 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\int \frac{x^3}{\sqrt{(x^2+1)}} dx = A(x^2+1)^{\frac{3}{2}} - B(x^2+1)^{\frac{1}{2}} + c$ then $A+B =$

Options :

1. ✘ $-\frac{3}{4}$

2. ✘ $\frac{2}{3}$

3. ✔ $\frac{4}{3}$

4. ✘ $\frac{5}{4}$

Question Number : 42 Question Id : 41809919444 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $S_n = \int_0^{\pi/2} \frac{\sin(2n-1)x}{\sin x} dx$ and n is an integer then $S_{n+1} - S_n =$

Options :

1. ✘ $-\frac{\pi}{2}$

2. ✔ 0

3. ✘ 1

4. ✘ $\frac{\pi}{2}$

Question Number : 43 Question Id : 41809919445 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = \begin{cases} x^2, & \text{for } 0 \leq x < 1 \\ \sqrt{x}, & \text{for } 1 < x \leq 2 \end{cases}$, then $\int_0^2 f(x) dx =$

Options :

1. ✘ $\left(\frac{4\sqrt{2} + 1}{3}\right)$

2. ✘ $\left(\frac{-4\sqrt{2} + 1}{3}\right)$

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

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

Question Number : 44 Question Id : 41809919446 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of arbitrary constants in a general solution of second order differential equation contains

Options :

1. ✘ Zero

2. ✘ One

3. ✔ Two

4. ✘ Three

Question Number : 45 Question Id : 41809919447 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of $\frac{x dx + y dy}{x^2 + y^2} = 0$ is

Options :

1. ✘ $\log(x + y) = c$

2. ✔ $\log(x^2 + y^2) = c$

3. ✘ $\log(xy) = c$

4. ✘ $\log(x - y) = c$

Question Number : 46 Question Id : 41809919448 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The integrating factor for the differential equation $(x + 1) \frac{dy}{dx} - y =$

$e^{3x}(x + 1)^2$ is _____

Options :

1. ✓ $\frac{1}{x+1}$

2. ✗ $x + 1$

3. ✗ $\frac{1}{x^2+1}$

4. ✗ $x^2 + 1$

Question Number : 47 Question Id : 41809919449 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Particular Integral of $(D^2 - 2D + 1)y = \cos hx$ is

Options :

1. ✓ $\frac{x^2 e^x}{4} + \frac{e^{-x}}{8}$

2. ✗ $\frac{x^2 e^{-x}}{4} + \frac{e^x}{8}$

3. ✗ $\frac{x^2 e^x}{4} - \frac{e^{-x}}{8}$

4. ✗

$$\frac{x^2 e^{-x}}{4} - \frac{e^x}{8}$$

Question Number : 48 Question Id : 41809919450 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2$ under the condition that $y = 1$ when $x = 1$ is

Options :

1. ✘ $4xy = x^3 + 3$

2. ✔ $4xy = x^4 + 3$

3. ✘ $4xy = y^3 + 3$

4. ✘ $4xy = y^4 + 3$

Question Number : 49 Question Id : 41809919451 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of the differential equation $\frac{d^4y}{dx^4} + 2\frac{d^2y}{dx^2} + y = 0$ is

Options :

1. ✔ $y = (c_1 + c_2x) \sin x + (c_3 + c_4x) \cos x$

2. ✘ $y = (c_1 \sin x + c_2 \cos x + x \sin x + x \cos x)$

3. ✘ $y = (c_1 \sin x + c_2 \cos x + c_3 \tan x + c_4 \cot x)$

4. ✘ $y = (c_1 \sin x + c_2 \cos x + c_3 x + c_4)$

Question Number : 50 Question Id : 41809919452 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of $(D^2 - 4)y = \sin 3x$ is

Options :

1. ✘ $c_1 e^{-2x} + c_2 e^{2x} + \frac{1}{13} \sin 3x$

2. ✔ $c_1 e^{-2x} + c_2 e^{2x} - \frac{1}{13} \sin 3x$

3. ✘ $c_1 e^{-2x} + c_2 e^{2x} - \frac{1}{5} \sin 3x$

4. ✘ $c_1 e^{-2x} + c_2 e^{2x} + \frac{1}{5} \sin 3x$

Physics

| | |
|--|-----------|
| Section Id : | 418099389 |
| Section Number : | 2 |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 25 |
| Section Marks : | 25 |
| Enable Mark as Answered Mark for Review and Clear Response : | Yes |
| Maximum Instruction Time : | 0 |
| Is Section Default? : | null |

Question Number : 51 Question Id : 41809919453 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the force (F), velocity (V) and time (T) are taken as fundamental units,
then the dimensions of mass are

Options :

1. ✓ $[FV^{-1}T]$

2. ✗ $[FVT^{-1}]$

3. ✗ $[FV^{-1}T^{-1}]$

4. ✗ $[FVT^{-2}]$

Question Number : 52 Question Id : 41809919454 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the units of force and velocity are doubled, then the units of power will

Options :

1. ✘ be halved
2. ✘ be doubled
3. ✔ be quadrupled
4. ✘ remain unaffected.

Question Number : 53 Question Id : 41809919455 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnitude of vector $3i+2j+12k$ is given by

Options :

1. ✔ $\sqrt{157}$
2. ✘ $\sqrt{112}$
3. ✘ $\sqrt{213}$

4. ✘ $9\sqrt{3}$

Question Number : 54 Question Id : 41809919456 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vector makes equal angle with the positive direction of all the three coordinate axes. Then each angle is equal to

Options :

1. ✘ $\text{Cos}^{-1}(-1/3)$

2. ✘ $\text{Cos}^{-1}(-2/3)$

3. ✔ $\text{Cos}^{-1}(1/\sqrt{3})$

4. ✘ $\text{Cos}^{-1}(2/3)$

Question Number : 55 Question Id : 41809919457 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Four bodies P, Q, R & S are projected with equal velocities having angle of projection $15^\circ, 30^\circ, 45^\circ$ & 60° with the horizontal plane respectively. The body having low horizontal range is

Options :

1. ✘

Q

2. ✓ P

3. ✗ S

4. ✗ R

Question Number : 56 Question Id : 41809919458 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Co-efficient of rolling friction is _____ Co-efficient of sliding friction.

Options :

1. ✗ Equal to

2. ✗ Greater than

3. ✓ Smaller than

4. ✗ Some times greater and some times smaller than

Question Number : 57 Question Id : 41809919459 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A body is thrown horizontally from the top of a tower of 20 m height. It touches the ground at a distance of 10 m from the foot of the tower. The initial velocity of the body is ($g=10\text{ms}^{-2}$)

Options :

1. ✘ 2.5 ms^{-1}

2. ✔ 5 ms^{-1}

3. ✘ 10 ms^{-1}

4. ✘ 20 ms^{-1}

Question Number : 58 Question Id : 41809919460 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 10 Newton force is applied on a body produce in it an acceleration of 2 ms^{-2} . The mass of the body is given by

Options :

1. ✘ 15 kg

2. ✘ 20 kg

3. ✘ 10 kg

4. ✔ 5 kg

Question Number : 59 Question Id : 41809919461 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The horizontal range and maximum height of a projectile are equal. The angle of projection of particle is given by

Options :

1. ✔ $\theta = \tan^{-1} 4$

2. ✘ $\theta = \tan^{-1}(1/4)$

3. ✘ $\theta = \tan^{-1} 2$

4. ✘ $\theta = 45^0$

Question Number : 60 Question Id : 41809919462 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The displacement of a particle moving in a straight line is given by

$x=2t^2+t+5$, where x is expressed in meter and t in seconds. The acceleration

at $t=2s$ is

Options :

1. ✘ 10ms^{-2}

2. ✘ 8ms^{-2}

3. ✔ 4ms^{-2}

4. ✘ 15ms^{-2}

Question Number : 61 Question Id : 41809919463 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A position-dependant force, $F = 8 - 4x + 3x^2$ N acts on a body of mass 2 kg.

and displaces it from $x = 0$ to $x = 5$ m. The work done is

Options :

1. ✔ 115 J

2. ✘ 110 J

3. ✘ 250 J

4. ✘ 270 J

Question Number : 62 Question Id : 41809919464 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An object of mass 5 kg falls from rest through a vertical distance of 20 m and attains a velocity of 10 ms^{-1} . How much work is done by the resistance of air on the object? (Consider acceleration due to gravity, $g = 10 \text{ ms}^{-2}$).

Options :

1. ✘ -250 J

2. ✔ -750 J

3. ✘ -500 J

4. ✘ -300 J

Question Number : 63 Question Id : 41809919465 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the heart pushes 1 cc of blood in one second under pressure 19500 Nm^{-2} , the power of heart is

Options :

1. ✓ 0.0195 W
2. ✗ 0.1950 W
3. ✗ 19.50 W
4. ✗ 9.50 W

Question Number : 64 Question Id : 41809919466 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is a necessary condition for simple harmonic motion?

Options :

1. ✗ proportionality between acceleration and velocity
2. ✓ proportionality between restoring force and displacement
3. ✗ constant time period
4. ✗ constant acceleration

Question Number : 65 Question Id : 41809919467 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The phase, at a given time 't', of a particle undergoing simple harmonic motion describes

Options :

1. ✘ only the direction of motion of the particle at time t
2. ✘ only the position of the particle at time t
3. ✔ both the position and direction of the particle at time t
4. ✘ only about the wavelength of the particle at time t

Question Number : 66 Question Id : 41809919468 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of a second's pendulum at the surface of the earth is

Options :

1. ✔ 100 cm
2. ✘ 98 cm

3. ✘ 98 m

4. ✘ 100 m

Question Number : 67 Question Id : 41809919469 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The reverberation time of a room is one second. What will be the reverberation time for another room having all the dimensions double that of the first room

Options :

1. ✘ $\frac{1}{2}$ Sec

2. ✔ 2 Sec

3. ✘ $\frac{1}{4}$ Sec

4. ✘ 4 Sec

Question Number : 68 Question Id : 41809919470 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Calculate the beat frequency if the interfering wave frequencies are 500Hz and 1000Hz respectively.

Options :

1. ✘ 1500 Hz

2. ✘ 250 Hz

3. ✘ 750 Hz

4. ✔ 500 Hz

Question Number : 69 Question Id : 41809919471 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Every gas behaves as an ideal gas at

Options :

1. ✘ high temperature and high pressure

2. ✘ Low temperature and low pressure

3. ✔ High temperature and low pressure

4. ✘

High pressure and low temperature

Question Number : 70 Question Id : 41809919472 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A perfect Carnot engine utilizes an ideal gas and works between the temperatures 227°C and 127°C . If the work output of the engines is 10^4 J, then the amount of heat received from the source will be

Options :

1. 1×10^4 J

1. ✘

2. 3×10^4 J

2. ✘

3. 5×10^4 J

3. ✔

4. 4×10^4 J

4. ✘

Question Number : 71 Question Id : 41809919473 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an adiabatic process of an ideal gas, the value of $\frac{dp}{p}$ is equal to

Options :

1. ✔

$$-\gamma \frac{dv}{v}$$

2. ✘ $-\gamma \frac{v}{dv}$

3. ✘ $\frac{dv}{v}$

4. ✘ $-\gamma^2 \frac{dv}{v}$

Question Number : 72 Question Id : 41809919474 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A system is given 400 calories of heat and 1000 joule of work is done by the system, then the change in internal energy of the system will be

Options :

1. ✔ 680 Joule

2. ✘ 680 erg

3. ✘ 860 Joule

4. ✘

-860 Joule

Question Number : 73 Question Id : 41809919475 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A perfect gas at 27°C is heated at constant pressure, so as to triple its volume. The temperature of the gas is

Options :

1. ✘ 627 K

2. ✔ 900 K

3. ✘ 300 K

4. ✘ 427 K

Question Number : 74 Question Id : 41809919476 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Work function of a metal is 10 eV. Photons of 20 eV are bombarded on it.

The photoelectric threshold frequency will be

Options :

1. ✓ equal to $\frac{10}{h}$

2. ✗ greater than $\frac{10}{h}$

3. ✗ less than $\frac{10}{h}$

4. ✗ greater than or equal to $\frac{10}{h}$

Question Number : 75 Question Id : 41809919477 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Superconducting material exhibits

Options :

1. ✗ zero conductivity & diamagnetism

2. ✗ zero resistivity & paramagnetism

3. ✗ infinite conductivity & paramagnetism

4. ✓ zero resistivity & diamagnetism

Chemistry

| | |
|--|-----------|
| Section Id : | 418099390 |
| Section Number : | 3 |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 25 |
| Section Marks : | 25 |
| Enable Mark as Answered Mark for Review and Clear Response : | Yes |
| Maximum Instruction Time : | 0 |
| Is Section Default? : | null |

Question Number : 76 Question Id : 41809919478 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a hydrogen atom, if the energy of an electron in the ground state is 13.6 eV, then that in the 2nd excited state is

Options :

1. ✓ 1.51 eV

2. ✗ 3.02 eV

3. ✗ 6.04 eV

4. ✗ 1.36 eV

Question Number : 77 Question Id : 41809919479 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Which of the following sets of quantum numbers is correct for an electron present in 4f orbital?

Options :

1. ✘ $n = 4, l = 4, m = -4, s = -\frac{1}{2}$

2. ✘ $n = 3, l = 2, m = -2, s = +\frac{1}{2}$

3. ✘ $n = 4, l = 3, m = +4, s = -\frac{1}{2}$

4. ✔ $n = 4, l = 3, m = +1, s = +\frac{1}{2}$

Question Number : 78 Question Id : 41809919480 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Which of the following statements in relation to the hydrogen atom is true?

Options :

1. ✘ 3s and 3p orbitals are of lower energy than 3d orbital

2. ✔ 3s, 3p and 3d orbitals all have the same energy

3. ✘ 3p orbital is lower in energy than 3d orbital

4. ✘ 3s orbital is lower in energy than 3p orbital

Question Number : 79 Question Id : 41809919481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Variable valency is shown by

Options :

1. ✘ s-block elements

2. ✘ s- and p- block elements

3. ✔ p- and d-block elements

4. ✘ All elements

Question Number : 80 Question Id : 41809919482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The compound in which C uses its sp^3 hybrid orbitals for bond formation is

Options :

1. ✔ $(CH_3)_3CH$

2. ✘ CH_3COOH

3. ✘ CH_3CHO

4. ✘ CH_3COCH_3

Question Number : 81 Question Id : 41809919483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The concentrated sulphuric acid that is sold commercially is 95% H_2SO_4 by weight. If the density of this commercial acid is 1.83 g cm^{-3} , the molarity of this solution is :-

Options :

1. ✘ 8.9

2. ✘ 9.8

3. ✘ 19.6

4. ✔ 18.3

Question Number : 82 Question Id : 41809919484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The density of a solution prepared by dissolving 100 g of urea (mol. mass = 60 u) in 1000 g of water is 1.15 g/mL . The molarity of this solution is

Options :

1. ✘ 2.04
2. ✘ 1.68
3. ✘ 0.92
4. ✔ 1.73

Question Number : 83 Question Id : 41809919485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a crystal of a solute is introduced into a super saturated solution of the solution, which of the following is true

Options :

1. ✘ The solution becomes unsaturated
2. ✔ The excess solute crystallizes out
3. ✘ The solute dissolves
4. ✘ The solution becomes saturated

Question Number : 84 Question Id : 41809919486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The conjugate acid of $S_2O_8^{2-}$ is

Options :

1. ✘ H_2SO_4

2. ✘ $H_2S_2O_7$

3. ✔ $HS_2O_8^-$

4. ✘ $H_2S_2O_8$

Question Number : 85 Question Id : 41809919487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following gases on dissolution in water make the solution acidic (A) CO (B) CO_2 (C) SO_3 (D) PH_3

Options :

1. ✘ (A) and (B)

2. ✔ (B) and (C)

3. ✘ (A) and (D)

4. ✘ (C) and (D)

Question Number : 86 Question Id : 41809919488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

On electrolysing a solution of dilute H_2SO_4 between platinum electrodes, the gas evolved at the anode and cathode are respectively

Options :

1. ✘ SO_2 and O_2

2. ✘ SO_3 and H_2

3. ✔ O_2 and H_2

4. ✘ H_2 and O_2

Question Number : 87 Question Id : 41809919489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an electrolytic cell, flow of electrons is from

Options :

1. ✘ cathode to anode in solution

2. ✔ cathode to anode through external supply

3. ✘ cathode to anode through internal supply

4. ✘ anode to cathode through external supply

Question Number : 88 Question Id : 41809919490 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The thermodynamic efficiency of a cell is given by

Options :

1. ✔ $nFE/\Delta H$

2. ✘ $\Delta H/\Delta G$

3. ✘ $nFE/\Delta G$

4. ✘ nFE°

Question Number : 89 Question Id : 41809919491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At 25 °C, the standard e.m.f. of cell having reactions involving two electron change is found to be 0.295 V. The equilibrium constant of the reaction is

Options :

1. ✘ 29.5×10^{-2}

2. ✘ 10

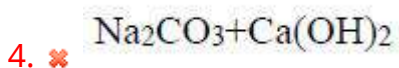
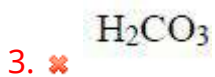
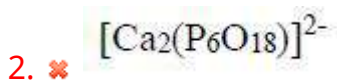
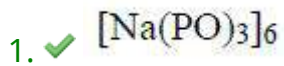
3. ✔ 10^{10}

4. ✘ 29.5×10^{10}

Question Number : 90 Question Id : 41809919492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the chemical formula of Calgon

Options :



Question Number : 91 Question Id : 41809919493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Alkalinity of water is due to the presence of _____

(A) OH^- (B) CO_3^{2-} (C) HCO_3^-

Options :

1. ✘ Only (A)
2. ✘ Both (A) and (B)
3. ✘ Both (B) and (C)
4. ✔ All the three (A), (B) and (C)

Question Number : 92 Question Id : 41809919494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brackish water means

Options :

1. ✘ Ground water
2. ✘ Fresh Water
3. ✘ River Water
4. ✔ Salt Water

Question Number : 93 Question Id : 41809919495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following two metals are corrosion resistant

Options :

1. ✘ Iron and Nickel
2. ✔ Nickel and Copper
3. ✘ Copper and Molybdenum
4. ✘ Iron and Molybdenum

Question Number : 94 Question Id : 41809919496 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coating which protects the base metal 'sacrificially' is

Options :

1. ✘ Metallic coating
2. ✔ Anodic coating
3. ✘

Metal oxide coating

4. ✘ Phosphate coating

Question Number : 95 Question Id : 41809919497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is also known as elastomers

Options :

1. ✘ PVC

2. ✘ Nylon 6,6

3. ✔ Synthetic rubber

4. ✘ Polycarbonate

Question Number : 96 Question Id : 41809919498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is an inorganic polymer?

Options :

1. ✔ Silicone

2. ✘

Epoxy resin

3. ✘ Polyurethane

4. ✘ Teflon

Question Number : 97 Question Id : 41809919499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The termination step in the cationic polymerization is caused by

Options :

1. ✘ Free radical

2. ✘ cation

3. ✔ anion

4. ✘ carbene

Question Number : 98 Question Id : 41809919500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sulphur compounds from gasoline are removed by

Options :

1. ✘ Lead sulphate

2. ✘ Lead nitrate

3. ✘ Lead sulphide

4. ✔ Sodium plumbite

Question Number : 99 Question Id : 41809919501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fluoride pollution mainly affects

Options :

1. ✔ Teeth

2. ✘ Heart

3. ✘ Kidneys

4. ✘ Liver

Question Number : 100 Question Id : 41809919502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Silicosis is caused by

Options :

1. ✘ Acid rain
2. ✔ Inhalation of aerosols
3. ✘ Inhalation of sulphurdioxide
4. ✘ Depletion of ozone

Metallurgical Engineering

| | |
|--|-----------|
| Section Id : | 418099391 |
| Section Number : | 4 |
| Mandatory or Optional : | Mandatory |
| Number of Questions : | 100 |
| Section Marks : | 100 |
| Enable Mark as Answered Mark for Review and Clear Response : | Yes |
| Maximum Instruction Time : | 0 |
| Is Section Default? : | null |

Question Number : 101 Question Id : 41809919503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An example of fine crushers is

Options :

1. ✓ Rod mill
2. ✘ Gyratory crushers
3. ✘ Cone crushers
4. ✘ Hammer Mill

Question Number : 102 Question Id : 41809919504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The energy required to grind a sample of materials is given by

Options :

1. ✘ Rittinger's law
2. ✘ Fick's law
3. ✓ Bond's work index
4. ✘ Kick's law

Question Number : 103 Question Id : 41809919505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore when subjected to grinding operation produces a product size less than 100 microns and the valuable particles are separated by

Options :

1. ✘ Density

2. ✘ Shape

3. ✘ Size

4. ✔ Magnetic property

Question Number : 104 Question Id : 41809919506 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The material which has passed the 20 mesh sieve but retained on the 24 mesh is designated as

Options :

1. ✘ -20-20

2. ✓ $-20+24$

3. ✗ $+20+24$

4. ✗ $+20-24$

Question Number : 105 Question Id : 41809919507 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The effectiveness of the screens is expressed as

Options :

1. ✓ $\text{Recovery} \times \text{Rejection}$

2. ✗ $\text{Recovery} - \text{Rejection}$

3. ✗ $\text{Recovery}/\text{Rejection}$

4. ✗ $\text{Recovery} + \text{Rejection}$

Question Number : 106 Question Id : 41809919508 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fine ore particles which are easily wetted by water have the nature of

Options :

1. ✘ Hydrostatic

2. ✘ Hydrophobic

3. ✔ Hydrophilic

4. ✘ Hydrophane

Question Number : 107 Question Id : 41809919509 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The relationship between the radius of atom(r) and lattice parameter(a) for

BCC crystal is

Options :

1. ✘ $r = 4a/\sqrt{3}$

2. ✔ $r = a\sqrt{3}/4$

3. ✘

$$r = a\sqrt{3}/2$$

$$r = a/\sqrt{3}$$

4. ✘

Question Number : 108 Question Id : 41809919510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Metallic bonds formed in materials are

Options :

Directional

1. ✘

Symmetrical

2. ✘

Circular

3. ✘

Non-directional

4. ✔

Question Number : 109 Question Id : 41809919511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The metal which is having FCC crystal structure is

Options :

1. ✘ Vanadium

2. ✘ Tungsten

3. ✘ Chromium

4. ✔ Silver

Question Number : 110 Question Id : 41809919512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The miller indices for the plane $(2 \ 1 \ 1/2)$ in a crystal is

Options :

1. ✔ $(1 \ 2 \ 4)$

2. ✘ $(4 \ 2 \ 1)$

3. ✘ $(1 \ 4 \ 2)$

(4 1 2)

4. ✘

Question Number : 111 Question Id : 41809919513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is not the family of direction for $\langle 2\ 1\ 1 \rangle$ is

Options :

1. ✘ [2 1 1]

2. ✘ [2 1 -1]

3. ✘ [1 1 -2]

4. ✔ [1 1 0]

Question Number : 112 Question Id : 41809919514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Consider the following statements for binary solid solutions:

Statement (i): Size difference between the parent atom and solute atom should be more than 15%.

Statement (ii): Electronegativity between metals should be small

Options :

Statement (i) & (ii) are true

1. ✘

Statement (i) is true & Statement (ii) is false

2. ✘

Statement (i) is false & Statement (ii) is true

3. ✔

Statement (i) & (ii) are false

4. ✘

Question Number : 113 Question Id : 41809919515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The example of an electron compound is

Options :

CuZn

1. ✔

TiN

2. ✘

3. ✘ FeAl

Al₂O₃

4. ✘

Question Number : 114 Question Id : 41809919516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Perfect crystal that are totally free of dislocations is known as

Options :

1. ✘ Metals

2. ✘ Ceramics

3. ✔ Whiskers

4. ✘ Composites

Question Number : 115 Question Id : 41809919517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dislocation climb is observed in

Options :

1. ✘ Casting

2. ✘ Welding

3. ✔ Creep

4. ✘ Melting

Question Number : 116 Question Id : 41809919518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The splitting of dislocation (b_1) into two partial dislocations (b_2) and (b_3) is favoured energetically when

Options :

1. ✔ $b_1^2 > b_2^2 + b_3^2$

2. ✘ $b_1^2 < b_2^2 + b_3^2$

3. ✘ $b_1^2 = b_2^2 + b_3^2$

$$b_1^2 \neq b_2^2 + b_3^2$$

4. ✘

Question Number : 117 Question Id : 41809919519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tilt boundaries are formed during the process of

Options :

1. ✘ Quenching

2. ✘ Normalising

3. ✘ Hardening

4. ✔ Recovery

Question Number : 118 Question Id : 41809919520 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The composition of phases in binary phase diagram are determined by

Options :

1. ✔

Tie line rule

2. ✘ Phase rule

3. ✘ Composition rule

4. ✘ Drawing rule

Question Number : 119 Question Id : 41809919521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The size of atom (r = radius) that can fit in the tetrahedral void in FCC unit cell is

Options :

1. ✘ $0.220r$

2. ✘ $0.249r$

3. ✔ $0.225r$

0.280r

4. ✘

Question Number : 120 Question Id : 41809919522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When two solids phase combines to give a solid phase , then this invariant reaction is called as

Options :

1. ✘ Eutectic reaction

2. ✘ Eutectiod reaction

3. ✘ Peritectic reaction

4. ✔ Peritectiod reaction

Question Number : 121 Question Id : 41809919523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The treatment given to avoid coring in Isomorphous alloys is

Options :

1. ✓ Homogenizing treatment

2. ✘ Hardening treatment

3. ✘ Quenching treatment

4. ✘ Carburising treatment

Question Number : 122 Question Id : 41809919524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ledeburite consists of

Options :

1. ✘ Austenite and ferrite

2. ✘ Austenite and pearlite

3. ✘ Austenite and martensite

4. ✓ Austenite and cementite

Question Number : 123 Question Id : 41809919525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The stabilising agent for austenite phase is

Options :

1. ✓ Nickel

2. ✘ Chromium

3. ✘ Silicon

4. ✘ Molybdenum

Question Number : 124 Question Id : 41809919526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nucleating agents added to Al-alloys to promote heterogeneous nucleation is

Options :

1. ✘ Iron and Silicon

2. ✓ Titanium and Boron

3. ✘ Zirconium and Silicon

4. ✘ Chromium and nickel

Question Number : 125 Question Id : 41809919527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The element which will not shift the C-curve to the right is

Options :

1. ✘ Chromium

2. ✓ Cobalt

3. ✘ Manganese

4. ✘ Silicon

Question Number : 126 Question Id : 41809919528 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match the following

| Phase | Hardness (R _c) |
|-------------------|----------------------------|
| (P) Soft Pearlite | (i) 40- 50 |
| (Q) Fine Pearlite | (ii) 50-55 |
| (R) Upper Bainite | (iii) 5 |
| (S) Lower Bainite | (iv) 20-25 |

Options :

1. ✓ P- iii, Q-iv, R- i, S- ii

2. ✗ P- iii, Q-iv, R- ii, S- i

3. ✗ P- iv, Q-iii, R- i, S- ii

4. ✗ P- i, Q-ii, R- iii, S- iv

Question Number : 127 Question Id : 41809919529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The change in hardness is a function of both temperature and time of tempering of carbon steels is given by the relationship is

Options :

1. ✓ Hollomon - Jaffee parameter
2. ✗ Larson - Miller Parameter
3. ✗ Hall-Petch parameter
4. ✗ Mott- Nabarro 's Parameter

Question Number : 128 Question Id : 41809919530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In continuous cooling transformation curve for eutectoid steel does not form

Options :

1. ✗ All pearlite structure
2. ✓ Bainite
3. ✗ Pearlite and martensite
4. ✗ All martensite structure

Question Number : 129 Question Id : 41809919531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The increasing order of stability of carbides in steel is

Options :

Fe > Mn > Cr > W

1. ✓

Fe > Cr > Mn > W

2. ✘

Fe > W > Cr > Mn

3. ✘

Fe > Cr > W > Mn

4. ✘

Question Number : 130 Question Id : 41809919532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a fully spheroidised steel, the spheroids consists of

Options :

Pearlite

1. ✘

Cementite

2. ✓

Martensite

3. ✘

Ferrite

4. ✘

Question Number : 131 Question Id : 41809919533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The full annealing temperature for hypereutectoid steel is

Options :

Above A_{c1}

1. ✓

Above A_{c3}

2. ✘

Above A_{cm}

3. ✘

Above A_{c2}

4. ✘

Question Number : 132 Question Id : 41809919534 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Temper embrittlement in steels can be removed by adding

Options :

1. Mo and Al

1. ✘

2. W and Cu

2. ✘

3. Al and Cu

3. ✘

4. W and Mo

4. ✔

Question Number : 133 Question Id : 41809919535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Grossman's critical diameter of steel having hardness of Rc 54, then the microstructure at the center of the steel rod is

Options :

1. 100% Martensite

1. ✘

2. 100% Pearlite

2. ✘

3. ✓ 50% Pearlite and 50% Martensite

50 % Austenite and 50% Pearlite

4. ✘

Question Number : 134 Question Id : 41809919536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order of severity of Quench (H) values for the quenching media from high to low is

Options :

1. ✘ Air, water, oil, brine

2. ✘ Brine, oil, water, air

3. ✘ Water, oil, brine, air

4. ✓ Brine, water, oil, air

Question Number : 135 Question Id : 41809919537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The standard specimen dimensions for Jominy End Quench test is

Options :

1. ✓ Length and diameter of rod is 4inch, 1 inch

2. ✗ Length and diameter of rod is 1inch, 1 inch

3. ✗ Length and diameter of rod is 1 inch, 4 inch

4. ✗ Length and diameter of rod is 1inch, 0.5 inch

Question Number : 136 Question Id : 41809919538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The liquid carburising batch consists of

Options :

1. ✓ NaCN, NaCl, BaCl₂

2. ✗ KCN, KCl, BaCl₂

3. ✗ NaCN, FeCl, BaCl₂

4. ✗

NaCN, NaCl, Fe₂O₃

Question Number : 137 Question Id : 41809919539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In nitriding of steel, a brittle phase is in the form of

Options :

1. ✘ Black layer

2. ✔ White layer

3. ✘ Blue layer

4. ✘ Yellow layer

Question Number : 138 Question Id : 41809919540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The percentage elongation corresponding to fracture point is called as

Options :

1. ✘ Reduction in area

Plastic instability

2. ✘

Uniform elongation

3. ✘

Total elongation

4. ✔

Question Number : 139 Question Id : 41809919541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The decreasing rate of work hardening is called

Options :

Dynamic recovery

1. ✔

Stress relieving

2. ✘

Grain growth

3. ✘

recrystallisation

4. ✘

Question Number : 140 Question Id : 41809919542 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match the following

Crystal structure

Slip Plane

(P) HCP

(i) (1 1 0)

(Q) FCC

(ii) (0 0 0 1)

(R) BCC

(iii) (1 1 1)

Options :

P- i, Q-ii, R-iii

1. ✘

P- ii, Q-iii, R-i

2. ✔

P- ii, Q-i, R-iii

3. ✘

P- iii, Q-i, R-ii

4. ✘

Question Number : 141 Question Id : 41809919543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Brittle fracture occur without any sign of

Options :

1. ✓ Plastic deformation

2. ✗ Creep

3. ✗ Strength

4. ✗ Recovery

Question Number : 142 Question Id : 41809919544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Griffith criteria is based on

Options :

1. ✗ No crack in brittle material

2. ✗ Pre-existing crack in ductile material

3. ✗ No crack in ductile material

4. ✓ Pre-existing crack in brittle material

Question Number : 143 Question Id : 41809919545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The fatigue life of materials cannot be increased by

Options :

1. ✘ Shot peening

2. ✔ Decarburising

3. ✘ Nitriding

4. ✘ Fine grain size

Question Number : 144 Question Id : 41809919546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The tool used for making holes in the rammed sand moulds for escaping of gases is

1. ✘ Rammers

2. ✘ Gaggers

3. ✘ Trowels

4. ✔ Vent wire

Question Number : 145 Question Id : 41809919547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The pattern used to produce large numbers of small castings is

Options :

1. ✘ Single piece pattern

2. ✔ Match plate pattern

3. ✘ Sweep pattern

4. ✘ Skeleton pattern

Question Number : 146 Question Id : 41809919548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Match the following

Additives

Properties

(P) Coal dust

(i) Self hardening

(Q) Dextrin

(ii) Bonding properties

(R) Molasses

(iii) Surface finish

(S) Sodium silicate

(iv) Bench life of sand

Options :

P-i, Q-ii, R-iii, S-iv

1. ✘

P-iii, Q-ii, R-i, S-iv

2. ✘

P-iii, Q-ii, R-iv, S-i

3. ✔

P-ii, Q-iii, R-iv, S-i

4. ✘

Question Number : 147 Question Id : 41809919549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore of magnesium is

Options :

Galena

1. ✘

2. ✘ Azurite

3. ✔ Carnalite

4. ✘ Cryolite

Question Number : 148 Question Id : 41809919550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mineral which is having magnetic in nature is

Options :

1. ✘ Chalcocite

2. ✘ Cuprite

3. ✘ Magnesite

4. ✔ Ilmenite

Question Number : 149 Question Id : 41809919551 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The function of depressor in froth flotation is

Options :

It acts like frother

1. ✘

It acts like a collector

2. ✘

It acts like an activator

3. ✘

It opposes the action of collector

4. ✔

Question Number : 150 Question Id : 41809919552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ore particles are roasted while suspended in an upward stream of gas is

Options :

Fluidized bed roasting

1. ✔

Flash roasting

2. ✘

Hearth roasting

3. ✘

Blast roasting

4. ✘

Question Number : 151 Question Id : 41809919553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Slags used in smelting are classified according to their

Options :

1. ✘ Calcium degree

2. ✔ Silicate degree

3. ✘ Manganese degree

4. ✘ Sulphur degree

Question Number : 152 Question Id : 41809919554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Matte smelting is adopted in extraction of

Options :

1. ✔ Copper and nickel

2. ✘ Silver and gold

3. ✘ Zinc and lead

4. ✘ Iron and aluminium

Question Number : 153 Question Id : 41809919555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The metallic values in an ore are selectively dissolved by a suitable reagent known as

Options :

1. ✘ Roasting

2. ✘ Sintering

3. ✔ Leaching

4. ✘ Blending

Question Number : 154 Question Id : 41809919556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process used for treating low grade bauxite ore is

Options :

1. ✘ Lime sinter process

2. ✘ Serpeck process

3. ✘ Dow's process

4. ✔ Deville-Pechiney process

Question Number : 155 Question Id : 41809919557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process which combine liquation and oxidation and it is carried out in a reverberatory furnace is

Options :

1. ✘ Sintering

2. ✘ Roasting

3. ✔ Drossing

4. ✘ Smelting

Question Number : 156 Question Id : 41809919558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The supports for the core in the sand mould is

Options :

1. ✘ Chills

2. ✘ Follow board

3. ✘ Rammer

4. ✔ Chaplet

Question Number : 157 Question Id : 41809919559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Among the sands given below which contain highest clay content is

Options :

1. ✘ Green sand

2. ✔ Loam sand

3. ✘ Dry sand

4. ✘ Skin dried sand

Question Number : 158 Question Id : 41809919560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The gel formed in carbondioxide process in making mould is

Options :

1. ✔ Silica gel

2. ✘ Alumina gel

3. ✘ Calcium gel

Sodium gel

4. ✘

Question Number : 159 Question Id : 41809919561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Cold chamber die casting is used to cast the materials like

Options :

Aluminium and magnesium

1. ✔

Lead and tin

2. ✘

Zinc and lead

3. ✘

Tin and zinc

4. ✘

Question Number : 160 Question Id : 41809919562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

To cast large size pipe by true centrifugal casting requires

Options :

1. ✘

Core is made of sand

2. ✘

Core is made of metal

3. ✔

No core

Core is made of plastic

4. ✘

Question Number : 161 Question Id : 41809919563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In full mould process pattern is made of

Options :

Plastic

1. ✘

Wood

2. ✘

Rubber

3. ✘

Polysterene

4. ✔

Question Number : 162 Question Id : 41809919564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The charge of cupola is

Options :

1. ✘ Scrap iron and coal

2. ✘ Wrought iron and coal

3. ✔ Pig iron and coke

4. ✘ Carbon steel and coke

Question Number : 163 Question Id : 41809919565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The defect occurs due to lack of fluidity in casting is

Options :

1. ✘ Scabs and washes

Misrun and cold shut

2. ✓

Drop and sand spots

3. ✘

Scar and buckles

4. ✘

Question Number : 164 Question Id : 41809919566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the pressurised gating system in casting process

Options :

1:2:2

1. ✘

1:3:3

2. ✘

1:1:3

3. ✘

1:2:1

4. ✓

Question Number : 165 Question Id : 41809919567 Display Question Number : Yes Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solidification time for a spherical casting of 1200mm in diameter having solidification factor of 0.87×10^6 s/m² is

Options :

1. ✘ 380 minutes

2. ✘ 280 minutes

3. ✔ 580 minutes

4. ✘ 480 minutes

Question Number : 166 Question Id : 41809919568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Current employed in TIG welding of Al and Mg is

Options :

1. ✔ AC

2. ✘ DC

3. ✘ DCRP

4. ✘ DCSP

Question Number : 167 Question Id : 41809919569 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the resistance welding process?

Options :

1. ✘ Soldering

2. ✘ Submerged arc welding

3. ✔ Projection welding

4. ✘ Metal inert gas welding

Question Number : 168 Question Id : 41809919570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The joining or repairing of railway track is done by

Options :

1. ✘ Tungsten inert gas welding

2. ✘ Metal inert gas welding

3. ✘ Spot welding

4. ✔ Thermit welding

Question Number : 169 Question Id : 41809919571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The disadvantage of electron beam welding is

Options :

1. ✘ High welding speed

2. ✘ Distortion is less

3. ✘ High penetration

Size limitation of workpiece

4. ✓

Question Number : 170 Question Id : 41809919572 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the process can be classified as solid state welding?

Options :

Friction welding

1. ✓

GTAW

2. ✘

GMAW

3. ✘

PAW

4. ✘

Question Number : 171 Question Id : 41809919573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nonconsumable electrode is used in

Options :

Submerged arc welding

1. ✘

Metal inert gas welding

2. ✘

Tungsten inert gas welding

3. ✔

Shielded metal arc welding

4. ✘

Question Number : 172 Question Id : 41809919574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Degassing of steel is employed to remove

Options :

Dissolved carbon

1. ✘

Dissolved gases

2. ✔

Dissolved phosphorus

3. ✘

4. ✘

Dissolved sulphur

Question Number : 173 Question Id : 41809919575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

COREX process used for producing

Options :

1. ✓ Steel

2. ✗ Manganese

3. ✗ Iron

4. ✗ Aluminium

Question Number : 174 Question Id : 41809919576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A high cycle fatigue failure sample is identified by the presence of

Options :

1. ✗ Vacancy

2. ✘ Voids

3. ✔ Beach marking or striations

4. ✘ Kirkendall marking

Question Number : 175 Question Id : 41809919577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The blast of heat air is introduced in the blast furnace at

Options :

1. ✔ Tuyeres

2. ✘ Hearth

3. ✘ Stack

4. ✘ Charge

Question Number : 176 Question Id : 41809919578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The process used for manufacturing wrought iron is

Options :

1. ✘ Cupola furnace
2. ✘ KALDO process
3. ✔ Pudding process
4. ✘ LD process

Question Number : 177 Question Id : 41809919579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Monel metal is an alloy of

Options :

1. ✘ Aluminium and Magnesium
2. ✔ Nickel and Copper
3. ✘

Magnesium and Nickel

Zinc and Copper

4. ✘

Question Number : 178 Question Id : 41809919580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Choose the incorrect statement

Options :

Plastics are light in weight

1. ✘

Plastics have high thermal conductivity

2. ✔

Plastics have good dimensional stability

3. ✘

Plastics are transparent and opaque

4. ✘

Question Number : 179 Question Id : 41809919581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the tetragonal crystal system

Options :

1. ✓ $a=b \neq c$ and $\alpha=\beta=\gamma=90^\circ$

2. ✗ $a=b=c$ and $\alpha \neq \beta \neq \gamma \neq 90^\circ$

3. ✗ $a \neq b \neq c$ and $\alpha=\beta=\gamma=90^\circ$

4. ✗ $a \neq b \neq c$ and $\alpha \neq \beta \neq \gamma=90^\circ$

Question Number : 180 Question Id : 41809919582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The cathode in an x-ray tube is made of

Options :

1. ✗ Nickel filament

2. ✓ Tungsten filament

3. ✗ Chromium filament

Cadmium filament

4. ✘

Question Number : 181 Question Id : 41809919583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Micum index of coke is measure of

Options :

1. ✓ Strength and hardness

2. ✘ Moisture

3. ✘ Density

4. ✘ permeability

Question Number : 182 Question Id : 41809919584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The proximate analysis of coal determines the

Options :

Ash, fixed carbon, volatile matter and moisture

1. ✓

Sulphur and carbon content

2. ✗

Carbon and volatile matter

3. ✗

Ash and sulphur content

4. ✗

Question Number : 183 Question Id : 41809919585 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main constituent of blast furnace gas is

Options :

N₂ and CH₄

1. ✗

CO and CO₂

2. ✗

CH₄ and CO

3. ✗

N₂ and CO

4. ✓

Question Number : 184 Question Id : 41809919586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

High alumina refractories compared to fireclay bricks have

Options :

Low refractoriness

1. ✘

High resistance to thermal shock and creep

2. ✔

Low load bearing capacity

3. ✘

Low resistance to slag attack

4. ✘

Question Number : 185 Question Id : 41809919587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At the top of the bosh region in blast furnace a large mass of charge

materials is stick to it is called as

Options :

Scaffolding

1. ✔

2. ✘ Draughting

3. ✘ Banking

4. ✘ pillaring

Question Number : 186 Question Id : 41809919588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following reaction takes place in blast furnace and it is called as



Options :

1. ✘ Solution loss reaction

2. ✘ Indirect reduction

3. ✘ Boudouard reaction

4. ✔ Direct reduction

Question Number : 187 Question Id : 41809919589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The life of refractory lining is less in case of

Options :

Bessemer converter

1. ✘

KALDO vessel

2. ✔

LD converter

3. ✘

Open hearth furnace

4. ✘

Question Number : 188 Question Id : 41809919590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fully deoxidised steel is called as

Options :

Capped steel

1. ✘

Rimmed steel

2. ✘

3. ✘ Semi killed steel

4. ✔ Killed steel

Question Number : 189 Question Id : 41809919591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The basic bessemer process of steel making is also known as

Options :

1. ✘ LD process

2. ✔ Thomas process

3. ✘ Open hearth process

4. ✘ Cupola furnace

Question Number : 190 Question Id : 41809919592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnetic particle inspection cannot detect the defects in

Options :

1. ✘ Precipitation hardened steels

2. ✔ Austenitic stainless steel

3. ✘ Cobalt alloys

4. ✘ Iron

Question Number : 191 Question Id : 41809919593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For detection of fatigue cracks during the service of materials is done by

Options :

1. ✘ Ultrasonic testing

2. ✘ Magnetic particle testing

3. ✔ Liquid penetrant testing

Eddy current testing

4. ✘

Question Number : 192 Question Id : 41809919594 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which case the reactions are possible at all the temperatures.

Options :

$\Delta H > 0$ and $\Delta S > 0$

1. ✘

$\Delta H < 0$ and $\Delta S < 0$

2. ✘

$\Delta H = 0$ and $\Delta S > 0$

3. ✘

$\Delta H < 0$ and $\Delta S > 0$

4. ✔

Question Number : 193 Question Id : 41809919595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The entropy change for a phase transformation is

Options :

1.

✘ $\Delta H - T\Delta S$

2. ✘ $\Delta G - T\Delta H$

3. ✘ Zero

4. ✔ $\Delta H/T$

Question Number : 194 Question Id : 41809919596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In endothermic reaction the value of ΔH is

Options :

1. ✔ Positive

2. ✘ Constant

3. ✘ Zero

4. ✘ negative

Question Number : 195 Question Id : 41809919597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Identify the intensity property from the following

Options :

1. ✘ Volume
2. ✘ Moles
3. ✔ Temperature
4. ✘ Enthalpy

Question Number : 196 Question Id : 41809919598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the extraction of ores, the Ellingham diagram helps to predict the feasibility of its

Options :

1. ✔ Thermal reduction
2. ✘

Electrolytic process

3. ✘ Zone refining process

4. ✘ Vapour phase extraction process

Question Number : 197 Question Id : 41809919599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The amount of heat required to raise the temperature of body by 1°C or 1K

is

Options :

1. ✘ Heat

2. ✘ Latent heat

3. ✔ Specific heat

4. ✘ Heat capacity

Question Number : 198 Question Id : 41809919600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The roll mill that hot reduces a slab directly to strip in one pass is

Options :

1. ✘ Cluster mill

2. ✔ Planetary mill

3. ✘ Two- high roll mill

4. ✘ Four high roll mill

Question Number : 199 Question Id : 41809919601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Chevron type of defect occurs in

Options :

1. ✘ Forging

2. ✘ Casting

3.

✓ Drawing rod and wires

Welding

4. ✘

Question Number : 200 Question Id : 41809919602 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which is the surface hardening treatment

Options :

Annealing

1. ✘

Normalising

2. ✘

Carburising

3. ✓

Stress relieving treatment

4. ✘