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 :	Ceramic Technology 19th Sep 2021 Shift1
Duration :	180
Total Marks :	200
Display Marks:	No
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? (SA type of questions will be always auto saved) :	Yes
Is this Group for Examiner? :	No

Mathematics

Section Id :	477203358

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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

Question Number : 1 Question Id : 47720318229 Display Question Number : Yes Is Question Mandatory : No

If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$ then $AB^T =$

Options :

1. ✖ $\begin{bmatrix} 19 & 22 \\ 43 & 50 \end{bmatrix}$

2. ✔ $\begin{bmatrix} 17 & 23 \\ 39 & 53 \end{bmatrix}$

3. ✖ $\begin{bmatrix} 26 & 38 \\ 30 & 44 \end{bmatrix}$

4. ✖ $\begin{bmatrix} 19 & 23 \\ 30 & 53 \end{bmatrix}$

Question Number : 2 Question Id : 47720318230 Display Question Number : Yes Is Question Mandatory : No

If A is any square matrix, then $A - A^T$ is

Options :

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1. ✖ a null matrix

2. ✖ an identity matrix

3. ✖ a symmetric matrix

4. ✔ a skew-symmetric matrix

Question Number : 3 Question Id : 47720318231 Display Question Number : Yes Is Question Mandatory : No

If $\begin{vmatrix} 4 & -5 & 6 \\ 7 & x & 8 \\ -1 & 2 & -3 \end{vmatrix} = 0$, then, x =

Options :

1. ✖ 0

2. ✖ $-\frac{55}{6}$

3. ✔ $-\frac{15}{2}$

4. ✖ 1

Question Number : 4 Question Id : 47720318232 Display Question Number : Yes Is Question Mandatory : No

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If $A = \begin{bmatrix} 3 & -5 \\ -7 & 2 \end{bmatrix}, I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and B is a square matrix such that $AB = I$, then, $B =$

Options :

1. ✖ $\begin{bmatrix} 2 & 5 \\ 7 & 3 \end{bmatrix}$

2. ✖ $\begin{bmatrix} -2 & 5 \\ 7 & -3 \end{bmatrix}$

3. ✔ $-\frac{1}{29}\begin{bmatrix} 2 & 5 \\ 7 & 3 \end{bmatrix}$

4. ✖ $-\frac{1}{29}\begin{bmatrix} -2 & 5 \\ 7 & -3 \end{bmatrix}$

Question Number : 5 Question Id : 47720318233 Display Question Number : Yes Is Question Mandatory : No

If $x = \alpha, y = \beta, z = \gamma$ is the unique solution of the system of simultaneous linear equations $x - 2y + z = 5, 2x + y - 2z = -3$ and $x - 2y + 3z = 9$, then, $\gamma =$

Options :

1. ✔ 2

2. ✖ -2

3. ✖ -3

4. ✖ 3

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Question Number : 6 Question Id : 47720318234 Display Question Number : Yes Is Question Mandatory : No

If $\frac{4x-22}{3x^2+2x-8}=\frac{A}{x+2}+\frac{B}{3x-4}$, then. $A+B=$

Options :

1. ✔ -2

2. ✖ 0

3. ✖ 2

4. ✖ 4

Question Number : 7 Question Id : 47720318235 Display Question Number : Yes Is Question Mandatory : No

If $\frac{4-7x^2}{3x^3+6x^2}=\frac{A}{x}+\frac{Bx+C}{x^2+2}$, then. $A+C=$

Options :

1. ✖ 0

2. ✔ $\frac{2}{3}$

3. ✖ $\frac{3}{2}$

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4. ✖ 2

Question Number : 8 Question Id : 47720318236 Display Question Number : Yes Is Question Mandatory : No

If $\tan\theta = -\frac{4}{3}$ and θ is not in the second quadrant, then, $\cos\theta + \csc\theta =$

Options :

1. ✔ $-\frac{13}{20}$

2. ✖ $-\frac{1}{5}$

3. ✖ $\frac{27}{20}$

4. ✖ $\frac{7}{5}$

Question Number : 9 Question Id : 47720318237 Display Question Number : Yes Is Question Mandatory : No

The sine function, whose period is $\frac{4}{5}$, is

Options :

1. ✖ $\sin\frac{5\pi}{4}x$

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$$\sin\frac{4\pi}{5}x$$

2. ✖

$$\sin\frac{5\pi}{2}x$$

3. ✔

$$\sin\frac{2\pi}{5}x$$

4. ✖

Question Number : 10 Question Id : 47720318238 Display Question Number : Yes Is Question Mandatory : No

If $A+B=\frac{3\pi}{4}$, then, $(1-\tan A)(1-\tan B)=$

Options :

1. ✖ 0

2. ✖ 1

3. ✔ 2

4. ✖ -2

Question Number : 11 Question Id : 47720318239 Display Question Number : Yes Is Question Mandatory : No

If $0<A<\frac{\pi}{4}$ and $\sin A=\frac{3}{5}$, then, $\sin 2A+\cos 2A=$

Options :

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1. ✖ $\frac{17}{25}$

2. ✖ $\frac{24}{25}$

3. ✖ $\frac{9}{25}$

4. ✔ $\frac{31}{25}$

Question Number : 12 Question Id : 47720318240 Display Question Number : Yes Is Question Mandatory : No

$\cos 56^0 + \sin 26^0 - \sin 86^0 =$

Options :

1. ✖ -1

2. ✔ 0

3. ✖ 1

4. ✖ 2

Question Number : 13 Question Id : 47720318241 Display Question Number : Yes Is Question Mandatory : No

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The general solution of the trigonometric equation $\sec x = 4\cos x$ is $x =$

Options :

1. ✔ $2n\pi \pm \frac{\pi}{3}$ or $2n\pi \pm \frac{2\pi}{3}$

2. ✖ $2n\pi \pm \frac{\pi}{6}$ or $2n\pi \pm \frac{5\pi}{6}$

3. ✖ $2n\pi \pm \frac{\pi}{4}$ or $2n\pi \pm \frac{3\pi}{4}$

4. ✖ $n\pi + (-1)^n \frac{\pi}{3}$ or $n\pi + (-1)^n \frac{2\pi}{3}$

Question Number : 14 Question Id : 47720318242 Display Question Number : Yes Is Question Mandatory : No

The general solution of the trigonometric equation $\cos 4\theta = \cos 3\theta$ is $\theta =$

Options :

1. ✖ $n\pi + \frac{\pi}{6}$

2. ✖ $2n\pi + \frac{\pi}{3}$

3. ✔ $\frac{2n\pi}{7}$ or $2n\pi$

4. ✖

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$\frac{n\pi}{7}$ or $n\pi$

Question Number : 15 Question Id : 47720318243 Display Question Number : Yes Is Question Mandatory : No

$$\cos\left[\frac{\pi}{2}+\cos^{-1}\left(-\frac{3}{5}\right)\right]=$$

Options :

1. ✖ $\frac{4}{5}$

2. ✖ $\frac{3}{5}$

3. ✔ $-\frac{4}{5}$

4. ✖ $-\frac{3}{5}$

Question Number : 16 Question Id : 47720318244 Display Question Number : Yes Is Question Mandatory : No

$$\cot\left[\mathrm{Tan}^{-1}\left(\frac{1}{6}\right)+\mathrm{Tan}^{-1}\left(\frac{5}{7}\right)\right]=$$

Options :

1. ✖ 0

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2. ✖ $\frac{1}{\sqrt{3}}$

3. ✔ 1

4. ✖ $\sqrt{3}$

Question Number : 17 Question Id : 47720318245 Display Question Number : Yes Is Question Mandatory : No

In a triangle ABC, if $b = 3, c = 4$ and $\cos A = \frac{7}{8}$, then, $a =$

Options :

1. ✖ 5

2. ✔ 2

3. ✖ 6

4. ✖ 8

Question Number : 18 Question Id : 47720318246 Display Question Number : Yes Is Question Mandatory : No

If $i^2 = -1$, then, $(1 - i)^{2020} =$

Options :

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1. ✔ -2^{1010}

2. ✖ 2^{1010}

3. ✖ 2^{2020}

4. ✖ -2^{2020}

Question Number : 19 Question Id : 47720318247 Display Question Number : Yes Is Question Mandatory : No

If $i^2 == -1$, then, $(\sqrt{3}+i)^4 + (\sqrt{3}-i)^4 =$

Options :

1. ✖ 32

2. ✖ -32

3. ✖ 16

4. ✔ -16

Question Number : 20 Question Id : 47720318248 Display Question Number : Yes Is Question Mandatory : No

If (1,2) and (2,1) are the ends of one of the diameters of a circle, then the equation of the circle is

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Options :

1. ✖ $x^2+y^2-3x-3y-4=0$

2. ✖ $x^2+y^2-3x+3y-4=0$

3. ✖ $x^2+y^2+3x-3y-4=0$

4. ✔ $x^2+y^2-3x-3y+4=0$

Question Number : 21 Question Id : 47720318249 Display Question Number : Yes Is Question Mandatory : No

The equation of the circle of radius 2 with its centre at $(2,2)$ is

Options :

1. ✔ $x^2+y^2-4x-4y+4=0$

2. ✖ $x^2+y^2+4x+4y+4=0$

3. ✖ $x^2+y^2-4x-4y+12=0$

4. ✖ $x^2+y^2+4x+4y+12=0$

Question Number : 22 Question Id : 47720318250 Display Question Number : Yes Is Question

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Mandatory : No

If the centre of the circle $x^2 + y^2 - 6x + ky + 9 = 0$ lies on the line $2x + y - 4 = 0$, then, the radius of that circle is

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 23 Question Id : 47720318251 Display Question Number : Yes Is Question Mandatory : No

Distance from the focus of the parabola $y^2 = 8x$ to the point $(2,4)$ on it is

Options :

1. ✖ 1

2. ✖ 2

3. ✖ 3

4. ✔ 4

Question Number : 24 Question Id : 47720318252 Display Question Number : Yes Is Question Mandatory : No

If e is the eccentricity and a is the length of the semi-minor axis of the ellipse $9x^2 + 4y^2 = 36$, then, $e^2 + a^2 =$

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Options :

1. ✔ $\frac{41}{9}$

2. ✖ $\frac{23}{9}$

3. ✖ $\frac{17}{3}$

4. ✖ $\frac{11}{3}$

Question Number : 25 Question Id : 47720318253 Display Question Number : Yes Is Question Mandatory : No

One of the foci of the hyperbola $\frac{x^2}{9}-\frac{y^2}{16}=-1$ is

Options :

1. ✖ $(5,0)$

2. ✔ $(0,5)$

3. ✖ $(4,0)$

4. ✖ $(0,3)$

Question Number : 26 Question Id : 47720318254 Display Question Numbe

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Mandatory : No

$$\lim_{x \to 0} \frac{2^x - 1}{\sqrt{2 + x} - \sqrt{2}} =$$

Options :

$\sqrt{2} \log 2$

1. ✖

$2 \log 2$

2. ✖

$2\sqrt{2} \log 2$

3. ✔

$\text{Log } 2$

4. ✖

Question Number : 27 Question Id : 47720318255 Display Question Number : Yes Is Question Mandatory : No

$$\text{If } y = \sqrt{\frac{2+x^2}{2-x^2}} \text{ , then, } \frac{dy}{dx} =$$

Options :

$$\frac{4x}{(2 - x^2)\sqrt{4 - x^4}}$$

1. ✔

$$\frac{4x}{(2 - x^2)\sqrt{4 - x^2}}$$

2. ✖

$$\frac{4x}{(4 - x^2)\sqrt{2 - x^4}}$$

3. ✖

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4. ✖ $\frac{2x}{(2-x^2)\sqrt{4-x^4}}$

Question Number : 28 Question Id : 47720318256 Display Question Number : Yes Is Question Mandatory : No

If $2x^2 - 3xy + y^2 - 4x + 6y - 7 = 0$, then, $\frac{dy}{dx} =$

Options :

1. ✖ $\frac{-4x-3y+4}{3x+2y+6}$

2. ✔ $\frac{4x-3y-4}{3x-2y-6}$

3. ✖ $\frac{4x+3y+4}{3x-2y-6}$

4. ✖ $\frac{4x-3y-4}{3x+2y-6}$

Question Number : 29 Question Id : 47720318257 Display Question Number : Yes Is Question Mandatory : No

If the radius of a sphere is increased from 5 cm to 5.03 cm, then, the approximate relative error in its surface area is

Options :

1. ✔ 0.012

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2. ✖ 0.06

3. ✖ 0.08

4. ✖ 0.1

Question Number : 30 Question Id : 47720318258 Display Question Number : Yes Is Question Mandatory : No

The equation of the normal at $(1,1)$ to the curve $y = 2x^3 - 3x^2 + x + 1$ is

Options :

1. ✔ $x + y - 2 = 0$

2. ✖ $x - y = 0$

3. ✖ $2x - 3y + 1 = 0$

4. ✖ $x - 2y + 1 = 0$

Question Number : 31 Question Id : 47720318259 Display Question Number : Yes Is Question Mandatory : No

The angle between the curves $x^2 + y^2 = 2$ and $y^2 = x$ is

Options :

1. ✔ $\mathrm{Tan}^{-1}(3)$

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2. ✖ $\mathrm{Tan}^{-1}(2)$

3. ✖ $\frac{\pi}{4}$

4. ✖ $\frac{\pi}{2}$

Question Number : 32 Question Id : 47720318260 Display Question Number : Yes Is Question Mandatory : No

If the volume of a cube is increasing at the rate of 5 cu. cm./sec , the rate of change in the length of the edge of the cube, when the length of the edge is 5 cm., is

Options :

1. ✖ $\frac{1}{15}$ sq. cm. /sec

2. ✖ 15 cm. /sec

3. ✔ $\frac{1}{15}$ cm. /sec

4. ✖ $\frac{1}{3}$ cm. /sec

Question Number : 33 Question Id : 47720318261 Display Question Number : Yes Is Question Mandatory : No

The interval in which the function $f(x) = 2x^3 - 9x^2 + 12x - 6$ is strictly increasing is

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Options :

1. ✖ $(1,2)$

2. ✖ $[1,2]$

3. ✖ $(-\infty, 1] \cup [2, \infty)$

4. ✔ $(-\infty, 1) \cup (2, \infty)$

Question Number : 34 Question Id : 47720318262 Display Question Number : Yes Is Question Mandatory : No

If the perimeter of a rectangle is 40 units, then the area of that rectangle is maximum when its dimensions are

Options :

1. ✖ 14, 6

2. ✖ 22, 18

3. ✔ 10, 10

4. ✖ 20, 20

Question Number : 35 Question Id : 47720318263 Display Question Number : Yes Is Question Mandatory : No

If $u = \frac{x^2+y^2}{x-y}$, then, $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} =$

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Options :

1. ✖ 0

2. ✖ u

3. ✔ $2\left(\frac{x+y}{x-y}\right)$

4. ✖ $2u$

Question Number : 36 Question Id : 47720318264 Display Question Number : Yes Is Question Mandatory : No

$$\int \frac{x^2+2x-1}{\sqrt{x^3+3x^2-3x+6}}\,dx =$$

Options :

1. ✔ $\frac{2}{3}\sqrt{x^3+3x^2-3x+6}+c$

2. ✖ $\frac{1}{3}\sqrt{x^3+3x^2-3x+6}+c$

3. ✖ $\frac{2}{3\sqrt{x^3+3x^2-3x+6}}+c$

4. ✖

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$$\frac{1}{6\sqrt{x^3+3x^2-3x+6}}+c$$

Question Number : 37 Question Id : 47720318265 Display Question Number : Yes Is Question Mandatory : No

$$\int e^{2x}\sec 2x(1+\tan 2x)\,dx =$$

Options :

1. ✖ $e^{2x}\sec 2x+c$

2. ✖ $e^{2x}\tan 2x+c$

3. ✔ $\frac{1}{2}e^{2x}\sec 2x+c$

4. ✖ $2e^{2x}\sec 2x+c$

Question Number : 38 Question Id : 47720318266 Display Question Number : Yes Is Question Mandatory : No

$$\int \frac{dx}{\sqrt{x^2-2x+5}} =$$

Options :

1. ✖ $\text{Tanh}^{-1}\left(\frac{x-1}{2}\right)+c$

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$\mathrm{Sinh}^{-1}(x-1)+c$

2. ✖

$\mathrm{Cosh}^{-1}\left(\frac{x-1}{2}\right)+c$

3. ✖

$\mathrm{Sinh}^{-1}\left(\frac{x-1}{2}\right)+c$

4. ✔

Question Number : 39 Question Id : 47720318267 Display Question Number : Yes Is Question Mandatory : No

$$\int_{-2}^{2}\frac{x^2}{x-1}\,dx=$$

Options :

$8+\log\frac{1}{3}$

1. ✖

$4-\log 3$

2. ✔

$2-\log 3$

3. ✖

$4+\log 3$

4. ✖

Question Number : 40 Question Id : 47720318268 Display Question Number : Yes Is Question Mandatory : No

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The area enclosed between the X-axis and the curve $y = (x-2)^2 - 9$ is

Options :

1. ✗ 54

2. ✗ $\frac{320}{3}$

3. ✓ 36

4. ✗ $\frac{124}{3}$

Question Number : 41 Question Id : 47720318269 Display Question Number : Yes Is Question Mandatory : No

The volume formed when the area bounded by the parabola $y^2 = 8x$, the X-axis and the ordinates at $x = 0$ and $x = 2$ rotates about the X-axis is (in cubic units)

Options :

1. ✗ 4π

2. ✗ 8π

3. ✗ 32π

4. ✓ 16π

Question Number : 42 Question Id : 47720318270 Display Question Number : Yes Is Question

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Mandatory : No

Mean value of $\frac{1}{4+x^2}$ on $[-2,2]$ is

Options :

1. ✖ $\frac{\pi}{4}$

2. ✖ $\frac{\pi}{8}$

3. ✖ $\frac{\pi}{32}$

4. ✔ $\frac{\pi}{16}$

Question Number : 43 Question Id : 47720318271 Display Question Number : Yes Is Question Mandatory : No

Root Mean Square value of $\sqrt{9-2x^2}$ over the range $x = 0$ to $x = 3$ is

Options :

1. ✔ $\sqrt{3}$

2. ✖ 3

3. ✖ $\sqrt{6}$

4. ✖ 9

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Question Number : 44 Question Id : 47720318272 Display Question Number : Yes Is Question Mandatory : No

The differential equation of the family of curves $y = Ae^{3x} + Be^{-2x}$, where A and B are arbitrary constants, is

Options :

1. ✖ $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = 0$

2. ✖ $\frac{d^2y}{dx^2} - \frac{dy}{dx} + 6y = 0$

3. ✖ $\frac{d^2y}{dx^2} + \frac{dy}{dx} - 6y = 0$

4. ✔ $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 6y = 0$

Question Number : 45 Question Id : 47720318273 Display Question Number : Yes Is Question Mandatory : No

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

Options :

1. ✖ $e^x + e^y = c$

2. ✖ $e^x - e^y = c$

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3. ✔ $e^{x+y} + ce^{y} + 1 = 0$

4. ✖ $e^{x+y} = ce^{y} + 1$

Question Number : 46 Question Id : 47720318274 Display Question Number : Yes Is Question Mandatory : No

The general solution of the differential equation $\frac{dy}{dx} - \frac{3y}{x} = \frac{2y^2}{x^2}$ is

Options :

1. ✔ $y = cx^2(x + y)$

2. ✖ $\frac{y}{x - y} = cx^2$

3. ✖ $y = cx(x + y)$

4. ✖ $y = cx(x - y)$

Question Number : 47 Question Id : 47720318275 Display Question Number : Yes Is Question Mandatory : No

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

Options :

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1. ✖ $2y = xe^{2x} + 2cx^2$

2. ✔ $2y = x^2e^{2x} + 2cx^2$

3. ✖ $y = 2x^2e^{2x} + cx^2$

4. ✖ $y = x^2e^{2x} + cx$

Question Number : 48 Question Id : 47720318276 Display Question Number : Yes Is Question Mandatory : No

The general solution of the differential equation $\frac{dy}{dx} + y\cot x = y^3 \sin^2 x$ is

Options :

1. ✖ $2x^2y + \csc^2 x = cy$

2. ✖ $2xy^2 + \sin^2 x = cy^2$

3. ✔ $2xy^2 + \csc^2 x = cy^2$

4. ✖ $2xy + \csc^2 x = cy^2$

Question Number : 49 Question Id : 47720318277 Display Question Number : Yes Is Question Mandatory : No

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

Options :

1. ✖ $\frac{1}{20}e^{3x}$

2. ✖ $\frac{1}{16}e^{3x}$

3. ✖ $\frac{1}{3}e^{3x}$

4. ✔ $\frac{1}{2}e^{3x}$

Question Number : 50 Question Id : 47720318278 Display Question Number : Yes Is Question Mandatory : No

The particular integral of the differential equation $(D^2 + 9)y = \sin 3x$ is

Options :

1. ✔ $-\frac{x\cos 3x}{6}$

2. ✖ $\frac{x\cos 3x}{6}$

3. ✖ $-\frac{x\sin 3x}{6}$

4. ✖

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$$\frac{x \sin 3x}{6}$$

Physics

Section Id :	477203359
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

Question Number : 51 Question Id : 47720318279 Display Question Number : Yes Is Question Mandatory : No

The dimension of Universal Gas Constant "R" is:

Options :

1. ✖ $[M^2 L^2 T^{-2} K^{-1}]$

2. ✖ $[M^1 L^2 T^{-2}]$

3. ✔ $[M^1 L^2 T^{-2} K^{-1}]$

4. ✖ $[M^2 L^2 T^{-2} K^0]$

Question Number : 52 Question Id : 47720318280 Display Question Number : Yes Is Question Mandatory : No

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The value of Planck's constant 'h' is 6.626×10^{-34} J.Hz^{-1}. Its value in eV is

Options :

1. ✖ 1.054×10^{-34}

2. ✔ 4.135×10^{-15}

3. ✖ 0.241×10^{15}

4. ✖ Unchanged

Question Number : 53 Question Id : 47720318281 Display Question Number : Yes Is Question Mandatory : No

A unit vector perpendicular to $A=\hat{i}+\hat{j}-\hat{k}$ and $B=2\hat{i}-\hat{j}+3\hat{k}$ is

Options :

1. ✖ $\hat{n}=(2\hat{i}-\hat{j}-3\hat{k})/\sqrt{14}$

2. ✔ $\hat{n}=(2\hat{i}-5\hat{j}-3\hat{k})/\sqrt{38}$

3. ✖ $\hat{n}=(2\hat{i}-5\hat{j}-3\hat{k})/\sqrt{28}$

4. ✖ $\hat{n}=(\hat{i}-\hat{j}-\hat{k})/\sqrt{3}$

Question Number : 54 Question Id : 47720318282 Display Question Number : Yes Is Question Mandatory : No

If the two vectors **A** and **B** are such that $|\mathbf{A}-\mathbf{B}|=|\mathbf{A}+\mathbf{B}|$ then

Options :

1. ✖ $\mathbf{A}=\mathbf{B}$

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2. ✖ **A** is parallel to **B**

3. ✖ $|\mathbf{B}| = 0$

4. ✔ **A** is perpendicular to **B**

Question Number : 55 Question Id : 47720318283 Display Question Number : Yes Is Question Mandatory : No

A rubber ball of mass 0.2 kg falls onto the floor. The ball hits with a speed of 8 m/s and rebounds with approximately the same speed. High speed photographs show that the ball is in contact with the floor for 10^{-3} s. Then the average force exerted on the ball by the floor is

Options :

1. ✖ 1,600 N

2. ✖ 0 N

3. ✔ 3,200 N

4. ✖ 320 N

Question Number : 56 Question Id : 47720318284 Display Question Number : Yes Is Question Mandatory : No

A projectile is fired with a speed 'u' at an angle θ with the horizontal. Find its speed when its direction of motion makes an angle α with the horizontal.

Options :

1. ✖ $u\cos(\theta)\cos(\alpha)$

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2. ✖ $u\cos(\theta)$

3. ✖ $u\cos(\alpha)$

4. ✔ $u\cos(\theta)\sec(\alpha)$

Question Number : 57 Question Id : 47720318285 Display Question Number : Yes Is Question

Mandatory : No

A person travelling on a straight line moves with a uniform velocity 'v_1' for a distance 'x' and with a uniform velocity 'v_2' for the next equal distance. The average velocity 'v' is given by

Options :

1. ✖ $v = \frac{v_1 + v_2}{2}$

2. ✖ $v = \sqrt{v_1 v_2}$

3. ✔ $\frac{2}{v} = \frac{1}{v_1} + \frac{1}{v_2}$

4. ✖ $\frac{1}{v} = \frac{1}{v_1} + \frac{1}{v_2}$

Question Number : 58 Question Id : 47720318286 Display Question Number : Yes Is Question

Mandatory : No

A ball is dropped from a height 'H'. If it takes 0.2 sec to cross the last 6.0 m before hitting the ground, the value of height 'H' from which it was dropped is

Options :

1. ✔ 48 m

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2. ✖ 42 m

3. ✖ 12 m

4. ✖ 30 m

Question Number : 59 Question Id : 47720318287 Display Question Number : Yes Is Question Mandatory : No

Mark the correct statement about the frictional force 'f' when a body slides across a surface with coefficient of friction μ.

Options :

1. ✖ The magnitude of 'f' is less than μN

2. ✔ 'f' is independent of the area of contact

3. ✖ 'f' depends on the area of contact

4. ✖ 'f' is directly proportional to the instantaneous velocity of the body

Question Number : 60 Question Id : 47720318288 Display Question Number : Yes Is Question Mandatory : No

A body starts slipping down an incline and moves half meter in half second. How long will it take to move the next half meter?

Options :

1. ✔ 0.2 sec

2. ✖ 0.5 sec

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3. ✖ 1.0 sec

4. ✖ 0.1 sec

Question Number : 61 Question Id : 47720318289 Display Question Number : Yes Is Question Mandatory : No

The energy needed to eject a 50kg spacecraft from the surface of the earth is (radius of the earth is 6.4×10^6 m)

Options :

1. ✖ 1.1×10^4 J

2. ✖ 1.1×10^9 J

3. ✖ 3.13×10^4 J

4. ✔ 3.13×10^9 J

Question Number : 62 Question Id : 47720318290 Display Question Number : Yes Is Question Mandatory : No

A particle of mass 'm' moves in one dimension along the positive x-axis. It is acted on by a constant force directed towards the origin with magnitude 'B', and an inverse square law repulsive force with magnitude (A/x^2) away from the origin. The equilibrium position x_0 of the mass is at

Options :

1. ✖ $x_0=0$

2. ✔ $x_0=(A/B)^{1/2}$

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3. ✖ $x_0=(A/B)$

4. ✖ $x_0=(B/A)^{1/2}$

Question Number : 63 Question Id : 47720318291 Display Question Number : Yes Is Question Mandatory : No

Ocean thermal energy is due to

Options :

1. ✖ Energy stored by waves in the ocean

2. ✖ Tides arising out in the ocean

3. ✖ Pressure difference at different levels in the ocean

4. ✔ Temperature difference at different levels in the ocean

Question Number : 64 Question Id : 47720318292 Display Question Number : Yes Is Question Mandatory : No

Consider the wave $y = (10\ mm)\ \sin[(2\ cm^{-1})x - (60\ s^{-1})t]$. The time period of this wave is

Options :

1. ✔ $\frac{\pi}{30}\sec$

2. ✖ $\frac{30}{\pi}\sec$

3. ✖ $\frac{\pi}{60}\sec$

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4. ✖ $\frac{\pi}{120}\text{sec}$

Question Number : 65 Question Id : 47720318293 Display Question Number : Yes Is Question Mandatory : No

If the speed of sound at 0^0 C is 332ms^{-1}, then the atmospheric temperature of a day when sound travels 336 m in one second is

Options :

1. ✖ 4^0 C

2. ✖ 20^0 C

3. ✖ 17^0 C

4. ✔ 7^0 C

Question Number : 66 Question Id : 47720318294 Display Question Number : Yes Is Question Mandatory : No

A sound source vibrates with a frequency of 1.0 kHz. Two sound waves, originating from this source, travel along different paths in air, where one path is 166 cm longer than other and then meet at a point. Then what will be the nature of interference? The speed of sound in air is 332 ms^{-1}.

Options :

1. ✔ It will be a constructive interference

2. ✖ It will be a destructive interference

3. ✖ Provided information is insufficient to say about nature of interference

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4. ✖ It will depend on the type of source

Question Number : 67 Question Id : 47720318295 Display Question Number : Yes Is Question Mandatory : No

A simple pendulum is taken to a place in space where its distance from the surface of the earth is equal to the radius of the earth. What will be the time period of small oscillations of the pendulum if the length of the string is 1.0 m. Take $g = \pi^2$ m/ s^2 at the surface of the earth.

Options :

1. ✖ 2 sec

2. ✔ 4 sec

3. ✖ $\frac{1}{\pi}$ sec

4. ✖ 2π sec

Question Number : 68 Question Id : 47720318296 Display Question Number : Yes Is Question Mandatory : No

The motion of a block of mass 'm' is restricted on x-axis by attaching two identical springs of spring constant 'k' on its opposite sides. The other ends of the springs are fixed on walls. When the mass is displaced from its equilibrium position on either side, it executes a simple harmonic motion. The period of oscillations for this oscillation is

Options :

1. ✖ $2\pi\sqrt{\frac{m}{k}}$

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2. ✖ $2\pi\sqrt{\frac{k}{m}}$

3. ✖ $2\pi\sqrt{\frac{2k}{m}}$

4. ✔ $2\pi\sqrt{\frac{m}{2k}}$

Question Number : 69 Question Id : 47720318297 Display Question Number : Yes Is Question Mandatory : No

Is it always true that $dU = C_v dT$?

Options :

1. ✖ Yes.

2. ✖ No, it is never true

3. ✔ It is true only for ideal gas

4. ✖ It is true only for non-ideal gas

Question Number : 70 Question Id : 47720318298 Display Question Number : Yes Is Question Mandatory : No

One mole of ideal monatomic gas is confined in a cylinder by a piston and is maintained at a constant temperature T_0 by thermal contact with a heat reservoir. The gas slowly expands from V_1 to V_2 while being held at the same temperature T_0. The change in internal energy of the gas is

Options :

1. ✖ $RT_0\ln(V_2/V_1)$

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2. ✔ zero

3. ✖ RT_0

4. ✖ $RT_0 \ln(V_1/V_2)$

Question Number : 71 Question Id : 47720318299 Display Question Number : Yes Is Question Mandatory : No

A pan filled with hot food cools from 94 °C to 86 °C in 2 minutes when the room temperature is at 20 °C. How long will it take to cool from 71 °C to 69 °C?

Options :

1. ✔ 0.7 min

2. ✖ 0.5 min

3. ✖ 0.4 min

4. ✖ 2 min.

Question Number : 72 Question Id : 47720318300 Display Question Number : Yes Is Question Mandatory : No

In an adiabatic expansion of an ideal gas

Options :

1. ✖ $PV = \text{constant}$

2. ✖ $PV^{\gamma-1} = \text{constant}$

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3. ✖ $TV^{\gamma} = \text{constant}$

4. ✔ $P^{1-\gamma}T^{\gamma} = \text{constant}$

Question Number : 73 Question Id : 47720318301 Display Question Number : Yes Is Question Mandatory : No

The rms speed of a nitrogen (N_2) molecule at 300K is (One mole of N_2 has a mass of 28 g and kB = 1.38×10^{23} JK^{-1})

Options :

1. ✖ 450 ms^{-1}

2. ✖ 123 ms^{-1}

3. ✔ 517 ms^{-1}

4. ✖ 230 ms^{-1}

Question Number : 74 Question Id : 47720318302 Display Question Number : Yes Is Question Mandatory : No

Which of the following are not the properties of superconductors?

Options :

1. ✖ They possess infinite conductivity

2. ✖ They possess zero resistivity

3. ✔ They are ferromagnetic in nature

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4. ✖ They are diamagnetic in nature

Question Number : 75 Question Id : 47720318303 Display Question Number : Yes Is Question Mandatory : No

The minimum energy required for a photoelectron to escape from a metal plate in a photocell is called

Options :

1. ✖ Planck's constant

2. ✔ Work function

3. ✖ Threshold energy

4. ✖ Stopping voltage

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Chemistry

Section Id :	477203360
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

Question Number : 76 Question Id : 47720318304 Display Question Number : Yes Is Question Mandatory : No

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Which of the following is not a fundamental particle?

Options :

1. ✖ Electron

2. ✖ Proton

3. ✔ Alpha particle

4. ✖ Neutron

Question Number : 77 Question Id : 47720318305 Display Question Number : Yes Is Question Mandatory : No

A given orbital labelled by the magnetic quantum number, m=-1. This cannot be

Options :

1. ✔ s-orbital

2. ✖ p-orbital

3. ✖ d-orbital

4. ✖ f-orbital

Question Number : 78 Question Id : 47720318306 Display Question Number : Yes Is Question Mandatory : No

Maximum number of electrons that may be present in one 4f-orbital is

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Options :

1. ✔ 2

2. ✖ 4

3. ✖ 7

4. ✖ 14

Question Number : 79 Question Id : 47720318307 Display Question Number : Yes Is Question Mandatory : No

Which of the following is favourable condition for the formation of ionic bond?

Options :

1. ✖ Small cation with small charge

2. ✖ Small anion with large charge

3. ✔ Large difference in the electronegativity

4. ✖ Small cation with large charge

Question Number : 80 Question Id : 47720318308 Display Question Number : Yes Is Question Mandatory : No

The covalency of nitrogen in HNO_2 is

Options :

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1. ✖ 0

2. ✖ 2

3. ✔ 3

4. ✖ 5

Question Number : 81 Question Id : 47720318309 Display Question Number : Yes Is Question Mandatory : No

The normality of 0.98%(w/v) H_2SO_4 solution is

Options :

1. ✖ 0.1N

2. ✔ 0.2N

3. ✖ 0.4N

4. ✖ 1 N

Question Number : 82 Question Id : 47720318310 Display Question Number : Yes Is Question Mandatory : No

The equivalent weight of $CuSO_4$ when it is converted to Cu_2I_2 (M= Mol.wt)

Options :

1. ✔

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M/1

2. ✖ M/2

3. ✖ M/3

4. ✖ 2M

Question Number : 83 Question Id : 47720318311 Display Question Number : Yes Is Question Mandatory : No

Which of the following is centi-normal solution ?

Options :

1. ✖ 1 N

2. ✖ N/10

3. ✖ N/20

4. ✔ N/100

Question Number : 84 Question Id : 47720318312 Display Question Number : Yes Is Question Mandatory : No

The unit for ionic product of water is

Options :

1. ✖ Mole/kg

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2. ✖ Mole-kg

3. ✔ $Mole^{2}lit^{-2}$

4. ✖ $Mole^{2}lit^{2}$

Question Number : 85 Question Id : 47720318313 Display Question Number : Yes Is Question Mandatory : No

Which of the following is relatively strong Lewis acid?

Options :

1. ✖ BF_3

2. ✖ BCl_3

3. ✖ BBr_3

4. ✔ BI_3

Question Number : 86 Question Id : 47720318314 Display Question Number : Yes Is Question Mandatory : No

The decrease in electrical conductivity of metals with increase in temperature is due to increase in

Options :

1. ✖ the velocity of electrons

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2. ✔ the resistance of the metal

3. ✖ the number of electrons

4. ✖ the number of metal atoms

Question Number : 87 Question Id : 47720318315 Display Question Number : Yes Is Question Mandatory : No

In the electrolytic cell, flow of electrons is from:

Options :

1. ✖ Cathode to anode in the solution

2. ✖ Cathode to anode through external circuit

3. ✔ Anode to cathode through external circuit

4. ✖ Anode to cathode in the solution

Question Number : 88 Question Id : 47720318316 Display Question Number : Yes Is Question Mandatory : No

The product of electrolysis of aqueous NaCl solution are

Options :

1. ✖ Na at cathode and Cl_2 at anode

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2. ✔ H_2 at cathode and Cl_2 at anode

3. ✖ H_2 at cathode and O_2 at anode

4. ✖ Na at cathode and O_2 at anode

Question Number : 89 Question Id : 47720318317 Display Question Number : Yes Is Question Mandatory : No

When zinc piece is kept in $CuSO_4$ solution, copper get precipitated because

Options :

1. ✖ Standard reduction potential of zinc is more than copper

2. ✔ Standard reduction potential of zinc is less than copper

3. ✖ Atomic number of zinc is larger than copper

4. ✖ Atomic number of zinc is lower than copper

Question Number : 90 Question Id : 47720318318 Display Question Number : Yes Is Question Mandatory : No

Hardness of water is expressed in terms of ------- equivalents.

Options :

1. ✔ $CaCO_3$

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2. ✖ $MgCO_3$

3. ✖ Na_2CO_3

4. ✖ K_2CO_3

Question Number : 91 Question Id : 47720318319 Display Question Number : Yes Is Question Mandatory : No

Anion exchange resin is regenerated by using

Options :

1. ✖ dil NaCl

2. ✖ dil HCl

3. ✔ dil NaOH

4. ✖ dil KCl

Question Number : 92 Question Id : 47720318320 Display Question Number : Yes Is Question Mandatory : No

Which of the following is responsible for temporary hardness?

Options :

1. ✖ $MgCl_2$

2. ✖ $CaSO_4$

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3. ✖ $MgSO_4$

4. ✔ $Mg(HCO_3)_2$

Question Number : 93 Question Id : 47720318321 Display Question Number : Yes Is Question Mandatory : No

Corrosion is an example of ---------

Options :

1. ✔ Oxidation

2. ✖ Reduction

3. ✖ Electrolysis

4. ✖ Hydrolysis

Question Number : 94 Question Id : 47720318322 Display Question Number : Yes Is Question Mandatory : No

In electrochemical corrosion, if the formed corrosion product is insoluble in the medium then the corrosion rate further ---------

Options :

1. ✖ Increases

2. ✔ Decreases

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3. ✖ Partially increases

4. ✖ No change

Question Number : 95 Question Id : 47720318323 Display Question Number : Yes Is Question Mandatory : No

Which of the following is an example of co-polymer ?

Options :

1. ✖ PVC

2. ✖ Teflon

3. ✖ Polythene

4. ✔ Buna-S rubber

Question Number : 96 Question Id : 47720318324 Display Question Number : Yes Is Question Mandatory : No

Which of the following polymer contains nitrogen atoms ?

Options :

1. ✖ PVC

2. ✖ Bakelite

3. ✔ Nylon

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4. ✖ Teflon

Question Number : 97 Question Id : 47720318325 Display Question Number : Yes Is Question Mandatory : No

Isoprene is monomer of

Options :

1. ✖ Teflon

2. ✖ Nylon

3. ✔ Natural rubber

4. ✖ PVC

Question Number : 98 Question Id : 47720318326 Display Question Number : Yes Is Question Mandatory : No

The only liquid fuel in nature is

Options :

1. ✖ Kerosene

2. ✖ Diesel

3. ✖ Petrol

4. ✔ Petroleum

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Question Number : 99 Question Id : 47720318327 Display Question Number : Yes Is Question Mandatory : No

The medium which reacts with pollutant is called

Options :

1. ✔ Sink

2. ✖ Receptor

3. ✖ Speciation

4. ✖ Contaminant

Question Number : 100 Question Id : 47720318328 Display Question Number : Yes Is Question Mandatory : No

Which of the following is used in the estimation of Chemical Oxygen Demand (COD) ?

Options :

1. ✖ Methyl orange

2. ✔ $K_2Cr_2O_7 + 50\% H_2SO_4$

3. ✖ $CaOCl_2 + 50\% H_2SO_4$

4. ✖ Alum +CaO

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Ceramic Technology

Section Id : 477203361

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

Question Number : 101 Question Id : 47720318329 Display Question Number : Yes Is Question Mandatory : No

Si^{4+} has a _____ coordination with oxygen

Options :

1. ✖ Cubic

2. ✖ Rhombohedral

3. ✖ Monoclinic

4. ✔ Tetrahedral

Question Number : 102 Question Id : 47720318330 Display Question Number : Yes Is Question Mandatory : No

The least degree of polymerization is found in _____

Options :

1. ✔ Orthosilicates

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2. ✖ Ring silicates

3. ✖ Chain silicates

4. ✖ Framework silicates

Question Number : 103 Question Id : 47720318331 Display Question Number : Yes Is Question Mandatory : No

_____ is the high-pressure polymorph of silica

Options :

1. ✖ Quartz

2. ✔ Stishovite

3. ✖ Tridymite

4. ✖ Cristobalite

Question Number : 104 Question Id : 47720318332 Display Question Number : Yes Is Question Mandatory : No

Microcrystalline quartz with colour bands or irregular colour patches is called ____

Options :

1. ✔ Agate

2. ✖ Flint

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3. ✖ Jasper

4. ✖ Amethyst

Question Number : 105 Question Id : 47720318333 Display Question Number : Yes Is Question Mandatory : No

The specific gravity of quartz is _____

Options :

1. ✖ 2.67

2. ✔ 2.65

3. ✖ 2.69

4. ✖ 2.63

Question Number : 106 Question Id : 47720318334 Display Question Number : Yes Is Question Mandatory : No

The formula for anorthite is _____

Options :

1. ✔ $CaAl_2Si_2O_8$

2. ✖ $CaAl_2SiO_8$

3. ✖ $CaAlSi_2O_8$

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4. ✖ $CaAl_3Si_2O_8$

Question Number : 107 Question Id : 47720318335 Display Question Number : Yes Is Question Mandatory : No

Dickite is a polymorph of _____

Options :

1. ✖ Attapulgite

2. ✖ Illite

3. ✖ Montmorillonite

4. ✔ Kaolinite

Question Number : 108 Question Id : 47720318336 Display Question Number : Yes Is Question Mandatory : No

_____ is an expanding clay

Options :

1. ✖ Bentonite

2. ✖ Fireclay

3. ✔ Vermiculite

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4. ✖ Stoneware clay

Question Number : 109 Question Id : 47720318337 Display Question Number : Yes Is Question Mandatory : No

Spodume is _____

Options :

1. ✖ Calcium aluminium silicate

2. ✖ Calcium aluminium borate

3. ✔ Lithium aluminium silicate

4. ✖ Lithium aluminium borate

Question Number : 110 Question Id : 47720318338 Display Question Number : Yes Is Question Mandatory : No

Beryl is the primary source for _____

Options :

1. ✔ Metallic berylium

2. ✖ Metallic copper

3. ✖ Metallic gold

4. ✖ Metallic silver

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Question Number : 111 Question Id : 47720318339 Display Question Number : Yes Is Question Mandatory : No

Magnesium silicate is _____

Options :

1. ✖ Fayalite

2. ✖ Tephroite

3. ✔ Forsterite

4. ✖ Pyralspite

Question Number : 112 Question Id : 47720318340 Display Question Number : Yes Is Question Mandatory : No

The essential structural element in all carbonate minerals is the _____ group

Options :

1. ✖ CO

2. ✔ CO_3^{2-}

3. ✖ $COOH$

4. ✖ CH_3

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Question Number : 113 Question Id : 47720318341 Display Question Number : Yes Is Question Mandatory : No

Intense heating of calcite drives off CO_2 and produces CaO which is known as _____

Options :

1. ✔ Quick lime

2. ✖ Calcined lime

3. ✖ Sintered lime

4. ✖ Reactive lime

Question Number : 114 Question Id : 47720318342 Display Question Number : Yes Is Question Mandatory : No

Bone ash contains _____% of CaO

Options :

1. ✖ 45

2. ✔ 55

3. ✖ 65

4. ✖ 75

Question Number : 115 Question Id : 47720318343 Display Question Number : Yes Is Ouestion

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Mandatory : No

Water glass is _____

Options :

1. ✖ Magnesium carbonate

2. ✖ Magnesium silicate

3. ✖ Sodium carbonate

4. ✔ Sodium silicate

Question Number : 116 Question Id : 47720318344 Display Question Number : Yes Is Question Mandatory : No

_____ is also called as terracotta

Options :

1. ✖ China clay

2. ✖ Ball clay

3. ✖ Fire clay

4. ✔ Red clay

Question Number : 117 Question Id : 47720318345 Display Question Number : Yes Is Question Mandatory : No

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_____clay is derived from volcanic ash

Options :

1. ✖ China clay

2. ✔ Bentonite clay

3. ✖ Montmorillonite clay

4. ✖ Fire clay

Question Number : 118 Question Id : 47720318346 Display Question Number : Yes Is Question Mandatory : No

Gypsum is _____

Options :

1. ✖ $CaSO_4.3H_2O$

2. ✖ $2CaSO_4.2H_2O$

3. ✔ $CaSO_4.2H_2O$

4. ✖ $CaSO_4.H_2O$

Question Number : 119 Question Id : 47720318347 Display Question Number : Yes Is Question Mandatory : No

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_____is caused due to lack of uniformity in the body

Options :

1. ✖ Spalling

2. ✖ Shrinkage

3. ✖ Cracking

4. ✔ Warping

Question Number : 120 Question Id : 47720318348 Display Question Number : Yes Is Question Mandatory : No

Higher grog content lowers _____

Options :

1. ✔ Tensile strength

2. ✖ Porosity

3. ✖ Thermal expansion

4. ✖ Chemical durability

Question Number : 121 Question Id : 47720318349 Display Question Number : Yes Is Question Mandatory : No

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Pugging a clay under reduced pressure increases _____

Options :

1. ✖ Porosity

2. ✖ Density

3. ✔ Plasticity

4. ✖ Viscosity

Question Number : 122 Question Id : 47720318350 Display Question Number : Yes Is Question Mandatory : No

An example of primary crusher is _____

Options :

1. ✔ Jaw crusher

2. ✖ Tube mills

3. ✖ Conical mills

4. ✖ Pebble mills

Question Number : 123 Question Id : 47720318351 Display Question Number : Yes Is Question Mandatory : No

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_____ is the process of shaping the rims of body into curves

Options :

1. ✖ Pulverising

2. ✔ Scalloping

3. ✖ Trimming

4. ✖ Blunging

Question Number : 124 Question Id : 47720318352 Display Question Number : Yes Is Question Mandatory : No

The moisture content for dry pressing is _____

Options :

1. ✖ 1-3%

2. ✖ 3-5%

3. ✔ 6-8%

4. ✖ 8-12%

Question Number : 125 Question Id : 47720318353 Display Question Number : Yes Is Question Mandatory : No

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Kaolin should not have more than _____ deflocculant

Options :

1. ✖ 0.4%

2. ✖ 0.3%

3. ✖ 0.2%

4. ✔ 0.1%

Question Number : 126 Question Id : 47720318354 Display Question Number : Yes Is Question Mandatory : No

The water absorption in wall tiles is _____

Options :

1. ✖ 1-5%

2. ✔ 5-10%

3. ✖ 11-13%

4. ✖ 13-17%

Question Number : 127 Question Id : 47720318355 Display Question Number : Yes Is Question Mandatory : No

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Vitreous china sanitaryware is fired at _____

Options :

1. ✖ 900°C

2. ✖ 1050°C

3. ✔ 1150°C

4. ✖ 1200°C

Question Number : 128 Question Id : 47720318356 Display Question Number : Yes Is Question Mandatory : No

The belt conveyor made of rubber cannot transport materials with _____ nature

Options :

1. ✔ Oily

2. ✖ Abrasive

3. ✖ Acidic

4. ✖ Flake

Question Number : 129 Question Id : 47720318357 Display Question Number : Yes Is Question Mandatory : No

Forces involved in mixing by impact wheels is _____

Options :

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1. ✖ Compression

2. ✖ Impact

3. ✔ Shear

4. ✖ Tension

Question Number : 130 Question Id : 47720318358 Display Question Number : Yes Is Question Mandatory : No

Test sieves for very fine sizes like BSS 300 are made of meshes with _____

Options :

1. ✖ Plain weave

2. ✖ Satin weave

3. ✖ Pile fabric

4. ✔ Twill weave

Question Number : 131 Question Id : 47720318359 Display Question Number : Yes Is Question Mandatory : No

Nepheline syenite is a type of _____rock

Options :

1. ✔

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Igneous

2. ✖ Clastic

3. ✖ Metamorphic

4. ✖ Non clastic

Question Number : 132 Question Id : 47720318360 Display Question Number : Yes Is Question Mandatory : No

The clay mineral which appears to be amorphous is _____

Options :

1. ✖ Attapulgite

2. ✔ Allophane

3. ✖ Illite

4. ✖ Nacrite

Question Number : 133 Question Id : 47720318361 Display Question Number : Yes Is Question Mandatory : No

_____ measures the bond rupture strength of a material under compression

Options :

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1. ✖ Flexural strength

2. ✖ Permanent linear change

3. ✔ Cold crushing strength

4. ✖ Thermal expansion

Question Number : 134 Question Id : 47720318362 Display Question Number : Yes Is Question Mandatory : No

The unit of thermal conductivity is _____

Options :

1. ✔ W/mK

2. ✖ Wm/K

3. ✖ 1/WmK

4. ✖ WmK

Question Number : 135 Question Id : 47720318363 Display Question Number : Yes Is Question Mandatory : No

Firing temperature of SiO_2 refractory is _____

Options :

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1. ✔ 1400 – 1500 °C

2. ✖ 1500 – 1800 °C

3. ✖ 1200 – 1400 °C

4. ✖ 1000 – 1200 °C

Question Number : 136 Question Id : 47720318364 Display Question Number : Yes Is Question Mandatory : No

_____ are used in the roof of glass tank furnaces

Options :

1. ✖ Magnesia refractories

2. ✖ Alumina refractories

3. ✖ Fireclay refractories

4. ✔ Silica refractories

Question Number : 137 Question Id : 47720318365 Display Question Number : Yes Is Question Mandatory : No

The composition of mullite is _____ Al_2O_3 and _____ SiO_2

Options :

1. ✖

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70.8 wt% and 29.2 wt%

71.8 wt% and 28.2 wt%

2. ✔

61.8 wt% and 38.2 wt%

3. ✖

81.8 wt% and 18.2 wt%

4. ✖

Question Number : 138 Question Id : 47720318366 Display Question Number : Yes Is Question Mandatory : No

_____ refractories are used for low temperature applications because of its chemical resistance

Options :

1. ✖ 40% Al_2O_3

2. ✖ 80% Al_2O_3

3. ✔ 99% Al_2O_3

4. ✖ 60% Al_2O_3

Question Number : 139 Question Id : 47720318367 Display Question Number : Yes Is Question Mandatory : No

Fireclay refractories contain _____

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Options :

1. ✔ 25-45 wt% Al_2O_3

2. ✖ 45-65 wt% Al_2O_3

3. ✖ 65-85 wt% Al_2O_3

4. ✖ 85-90 wt% Al_2O_3

Question Number : 140 Question Id : 47720318368 Display Question Number : Yes Is Question Mandatory : No

Magnesia refractories have _____

Options :

1. ✖ Low thermal expansion

2. ✖ Low wear resistance

3. ✔ Low thermal spalling resistance

4. ✖ Low Corrosion resistance

Question Number : 141 Question Id : 47720318369 Display Question Number : Yes Is Question Mandatory : No

_____ is the highly porous & reactive product resulting from low temperature calcination of dolomite

ZOLLEGE.in

Options :

1. ✔ Doloma

2. ✖ Dead burned magnesite

3. ✖ Clinker

4. ✖ Grog

Question Number : 142 Question Id : 47720318370 Display Question Number : Yes Is Question Mandatory : No

Serpentine is _____

Options :

1. ✖ $MgO.2SiO_2.2H_2O$

2. ✖ $3MgO.SiO_2.2H_2O$

3. ✔ $3MgO.2SiO_2.2H_2O$

4. ✖ $3MgO.2SiO_2.H_2O$

Question Number : 143 Question Id : 47720318371 Display Question Number : Yes Is Question Mandatory : No

Refractoriness under load of chromite refractories varies from _____

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Options :

1. ✖ $1200 - 1250\ ^{\circ}C$

2. ✖ $1300 - 1350\ ^{\circ}C$

3. ✖ $1400 - 1450\ ^{\circ}C$

4. ✔ $1500 - 1550\ ^{\circ}C$

Question Number : 144 Question Id : 47720318372 Display Question Number : Yes Is Question Mandatory : No

Antioxidants used in MgO - C refractories is _____

Options :

1. ✔ Mg

2. ✖ MnO_2

3. ✖ Si_3N_4

4. ✖ B

Question Number : 145 Question Id : 47720318373 Display Question Number : Yes Is Question Mandatory : No

_____ is used in the nozzles for iron and steel industries

Options :

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1. ✖ Magnesia refractories

2. ✔ Zirconia refractories

3. ✖ Silica refractories

4. ✖ Alumina refractories

Question Number : 146 Question Id : 47720318374 Display Question Number : Yes Is Question Mandatory : No

Dense commercial refractories have a total porosity of _____

Options :

1. ✖ 10-15%

2. ✖ 20-25%

3. ✔ 30-35%

4. ✖ 40-45%

Question Number : 147 Question Id : 47720318375 Display Question Number : Yes Is Question Mandatory : No

_____ is produced by Acheson's process

Options :

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1. ✔ SiC

2. ✖ Si_3N_4

3. ✖ B_4N

4. ✖ WC

Question Number : 148 Question Id : 47720318376 Display Question Number : Yes Is Question Mandatory : No

_____ is used in cutting tool applications

Options :

1. ✖ Silicon carbide

2. ✖ Silicon nitride

3. ✖ Boron nitride

4. ✔ Tungsten carbide

Question Number : 149 Question Id : 47720318377 Display Question Number : Yes Is Question Mandatory : No

Heat setting mortar hardens at elevated temperature by _____

Options :

ZOLLEGE.in

1. ✔ Ceramic bonds

2. ✖ Hydraulic bonds

3. ✖ Phosphate bonds

4. ✖ Glass bonds

Question Number : 150 Question Id : 47720318378 Display Question Number : Yes Is Question Mandatory : No

_____ is a glass modifier

Options :

1. ✖ Si

2. ✖ Ge

3. ✖ B

4. ✔ K

Question Number : 151 Question Id : 47720318379 Display Question Number : Yes Is Question Mandatory : No

The temperature at which the elongation occurs at 1mm/ min is called _____

Options :

1. ✔ Littleton temperature

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2. ✖ Curie temperature

3. ✖ Weiss temperature

4. ✖ Transition temperature

Question Number : 152 Question Id : 47720318380 Display Question Number : Yes Is Question Mandatory : No

The viscosity of the glass at the working point is _____

Options :

1. ✖ $\log \eta = 0.1$

2. ✔ $\log \eta = 4$

3. ✖ $\log \eta = 2$

4. ✖ $\log \eta = 10$

Question Number : 153 Question Id : 47720318381 Display Question Number : Yes Is Question Mandatory : No

Vogel – Fulcher Tamann equation is _____

Options :

1. ✔ $\log \eta = A + B/ (T\text{-}T_0)$

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2. ✖ $\log \eta = A - B * (T-T_o)$

3. ✖ $\log \eta = A - B/ (T+T_o)$

4. ✖ $\log \eta = A + B * (T-T_o)$

Question Number : 154 Question Id : 47720318382 Display Question Number : Yes Is Question Mandatory : No

Heat absorbing glasses are made from _____

Options :

1. ✔ Iron doped alumino-phosphates

2. ✖ Zinc doped alumino-phosphates

3. ✖ Neodymium doped alumino-phosphates

4. ✖ Magnesium doped alumino-phosphates

Question Number : 155 Question Id : 47720318383 Display Question Number : Yes Is Question Mandatory : No

Hard glasses have thermal expansion coefficient values _____

Options :

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1. ✖ $< 6 \times 10^{-3} / K$

2. ✖ $< 6 \times 10^{-2} / K$

3. ✔ $< 6 \times 10^{-6} / K$

4. ✖ $< 6 \times 10^{-5} / K$

Question Number : 156 Question Id : 47720318384 Display Question Number : Yes Is Question Mandatory : No

Crystal glass contains _____

Options :

1. ✔ $< 18\%$ PbO

2. ✖ $> 20\%$ MgO

3. ✖ $< 25\%$ CaO

4. ✖ $> 20\% Na_2O$

Question Number : 157 Question Id : 47720318385 Display Question Number : Yes Is Question Mandatory : No

_____ is used as an opacifier in glass

ZOLLEGE.in

Options :

1. ✖ Soda

2. ✖ Alumina

3. ✖ Silica

4. ✔ Fluorspar

Question Number : 158 Question Id : 47720318386 Display Question Number : Yes Is Question Mandatory : No

Working temperature of glass is _____

Options :

1. ✖ 600-900°C

2. ✔ 900-1200°C

3. ✖ 1200-1300°C

4. ✖ 1300-1400°C

Question Number : 159 Question Id : 47720318387 Display Question Number : Yes Is Question Mandatory : No

Zones of glass with different refractive index, producing distortion of light is called _____

ZOLLEGE.in

Options :

1. ✖ Cords

2. ✖ Bubbles

3. ✔ Striae

4. ✖ Stones

Question Number : 160 Question Id : 47720318388 Display Question Number : Yes Is Question Mandatory : No

Translucent rolled glass with a special surface relief to scatter light is called _____

Options :

1. ✖ Tempered glass

2. ✔ Greenhouse glass

3. ✖ Laminated glass

4. ✖ Wire reinforced glass

Question Number : 161 Question Id : 47720318389 Display Question Number : Yes Is Question Mandatory : No

The only metal that is liquid at 600°C is _____

Options :

ZOLLEGE.in

1. ✖ Aluminium

2. ✖ Lead

3. ✖ Mercury

4. ✔ Tin

Question Number : 162 Question Id : 47720318390 Display Question Number : Yes Is Question Mandatory : No

The process of dipping a colorless glass parison into colored glass followed by blowing is called _____

Options :

1. ✔ Flashing

2. ✖ Tempering

3. ✖ Blowing

4. ✖ Throwing

Question Number : 163 Question Id : 47720318391 Display Question Number : Yes Is Question Mandatory : No

The coloring agents used in pharmaceutical glasses is _____

Options :

1. ✖

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Zinc Oxide

2. ✔ Iron Oxide

3. ✖ Magnesium Oxide

4. ✖ Cesium Oxide

Question Number : 164 Question Id : 47720318392 Display Question Number : Yes Is Question Mandatory : No

_____ is used in sealing glasses

Options :

1. ✔ Molybdenum

2. ✖ Titanium

3. ✖ Zinc

4. ✖ Copper

Question Number : 165 Question Id : 47720318393 Display Question Number : Yes Is Question Mandatory : No

Abbe's number is _____

Where n_d, nf, nc are the refractive indices of the material at the wavelengths of the Fraunhofer

D-, F-, C- spectral lines

ZOLLEGE.in

Options :

1. ✖ $(n_d + 1) / (n_f + n_c)$

2. ✖ $(n_d + 1)$ x $(n_f + n_c)$

3. ✔ $(n_d - 1) / (n_f - n_c)$

4. ✖ $(n_d - 1)$ x $(n_f - n_c)$

Question Number : 166 Question Id : 47720318394 Display Question Number : Yes Is Question Mandatory : No

The crystallized portion in the glass ceramic by volume can be between _____ depending on the desired properties

Options :

1. ✖ 20% and 30%

2. ✖ 40% and 50%

3. ✔ 50% and 90%

4. ✖ 80% and 95%

Question Number : 167 Question Id : 47720318395 Display Question Number : Yes Is Question Mandatory : No

ZOLLEGE.in

Alite is _____

Options :

1. ✔ Tricalcium Silicate

2. ✖ Dicalcium Silicate

3. ✖ Tricalcium aluminate

4. ✖ Tetracalcium aluminoferrite

Question Number : 168 Question Id : 47720318396 Display Question Number : Yes Is Question Mandatory : No

How much percentage of gypsum is added to the clinker during its grinding as an additive?

Options :

1. ✖ 10 - 12%

2. ✔ 4 – 6%

3. ✖ 1 – 2%

4. ✖ 15 – 20%

Question Number : 169 Question Id : 47720318397 Display Question Number : Yes Is Question

ZOLLEGE.in

Mandatory : No

Which among the following is a calcareous material used in the manufacture of cement?

Options :

1. ✖ Laterite

2. ✔ Lime stone

3. ✖ Silica

4. ✖ Alumina

Question Number : 170 Question Id : 47720318398 Display Question Number : Yes Is Question Mandatory : No

Cement is manufactured by milling/ grinding _____ and _____

Options :

1. ✔ Clinker and Gypsum

2. ✖ Clinker and Magnesia

3. ✖ Clinker and Quartz sand

4. ✖ Clinker and clay minerals

Question Number : 171 Question Id : 47720318399 Display Question Number : Yes Is Question

ZOLLEGE.in

Mandatory : No

Most majorly used raw material for the manufacture of cement by rotary kiln in the dry process is_____

Options :

1. ✖ Silica

2. ✔ Lime stone

3. ✖ Alumina

4. ✖ Iron

Question Number : 172 Question Id : 47720318400 Display Question Number : Yes Is Question Mandatory : No

Which of the following is the definition of wet process of cement manufacturing?

Options :

1. ✖ Grinding and mixing of the raw materials in their dry state

2. ✖ Grinding and mixing of the raw materials in their semi dry state

3. ✔ Grinding and mixing of the raw materials in their wet state

4. ✖ Grinding and mixing of the raw materials in their semi wet state

Question Number : 173 Question Id : 47720318401 Display Question Number : Yes Is Question

ZOLLEGE.in

Mandatory : No

_____ is a conical shaped structure in which hot air/ gas is passed and exchange of heat is done.

Options :

1. ✖ Kiln

2. ✖ Support rollers

3. ✖ Burner

4. ✔ Cyclone

Question Number : 174 Question Id : 47720318402 Display Question Number : Yes Is Question Mandatory : No

Clinkers leave the cement rotary kiln at the temperature of _____

Options :

1. ✖ 900°C

2. ✖ 1400°C

3. ✖ 1600°C

4. ✔ 1100°C

Question Number : 175 Question Id : 47720318403 Display Question Number : Yes Is Question Mandatory : No

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Large kilns are required for the manufacture of cement by _____ process

Options :

1. ✔ Wet

2. ✖ Semi wet

3. ✖ Dry

4. ✖ Semi dry

Question Number : 176 Question Id : 47720318404 Display Question Number : Yes Is Question Mandatory : No

Which electrical ceramics has a high coefficient of thermal expansion?

Options :

1. ✔ Zircon porcelain

2. ✖ Cordierite

3. ✖ Low loss steatite

4. ✖ Magnesium titanate

Question Number : 177 Question Id : 47720318405 Display Question Number : Yes Is Question Mandatory : No

ZOLLEGE.in

Which of the following material can be used as a oxygen sensor?

Options :

1. ✖ Polycrystalline SiC

2. ✖ Hot pressed $MoSi_2$

3. ✔ Cubic stabilized zirconia

4. ✖ White fused alumina

Question Number : 178 Question Id : 47720318406 Display Question Number : Yes Is Question Mandatory : No

Which of the following material is not an electro-optic ceramic material?

Options :

1. ✖ $LiNbO_3$

2. ✖ $LiTaO_3$

3. ✔ PZT

4. ✖ PLZT

Question Number : 179 Question Id : 47720318407 Display Question Number : Yes Is Question Mandatory : No

Which of the following material is used as cutting tool bit?

ZOLLEGE.in

Options :

1. ✖ B_2O_3

2. ✔ SiC

3. ✖ Al_2O_3

4. ✖ BN

Question Number : 180 Question Id : 47720318408 Display Question Number : Yes Is Question Mandatory : No

Which of the following is a Permanent Magnet?

Options :

1. ✖ Zinc Ferrite

2. ✔ Barium ferrite

3. ✖ Nickel ferrite

4. ✖ Manganese ferrite

Question Number : 181 Question Id : 47720318409 Display Question Number : Yes Is Question Mandatory : No

Which of the following material is not Piezoelectric?

ZOLLEGE.in

Options :

1. ✖ Quartz

2. ✖ Rochelle salt

3. ✔ Rutile

4. ✖ Barium Titanate

Question Number : 182 Question Id : 47720318410 Display Question Number : Yes Is Question Mandatory : No

Which of the following ceramic material is used in spark plug of auto mobiles?

Options :

1. ✖ Silicon carbide

2. ✔ Alumina

3. ✖ Zirconia

4. ✖ Magnesia

Question Number : 183 Question Id : 47720318411 Display Question Number : Yes Is Question Mandatory : No

Radiation shield glass in Nuclear Reactor contains _____

Options :

ZOLLEGE.in

1. ✔ High lead with cerium

2. ✖ Low lead with manganese

3. ✖ High lead with bismuth

4. ✖ Low lead with barium

Question Number : 184 Question Id : 47720318412 Display Question Number : Yes Is Question Mandatory : No

The maximum service life of graphite electrode is _____

Options :

1. ✖ 2200 – 2500 °C

2. ✔ 3500 – 3600 °C

3. ✖ 1800 – 2000 °C

4. ✖ 900 – 1200 °C

Question Number : 185 Question Id : 47720318413 Display Question Number : Yes Is Question Mandatory : No

_____ is used as a moderator in nuclear reactor

ZOLLEGE.in

Options :

1. ✖ BaO

2. ✖ ZrO_2

3. ✖ CaO

4. ✔ BeO

Question Number : 186 Question Id : 47720318414 Display Question Number : Yes Is Question Mandatory : No

The process of conversion of peat to coal is termed as _____

Options :

1. ✔ Metamorphism

2. ✖ Polymorphism

3. ✖ Decomposition

4. ✖ Dihydroxylation

Question Number : 187 Question Id : 47720318415 Display Question Number : Yes Is Question Mandatory : No

If E_b – emissive power, T – Temperature then Stephan Boltzmann law is _____

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Options :

1. ✖ $E_b = \sigma / T^4$

2. ✖ $E_b = \sigma T^{10}$

3. ✔ $E_b = \sigma T^4$

4. ✖ $E_b = \sigma / T^{10}$

Question Number : 188 Question Id : 47720318416 Display Question Number : Yes Is Question Mandatory : No

$MoSi_2$ heating elements can be used in laboratory kilns up to _____

Options :

1. ✖ 1800°C

2. ✔ 1650°C

3. ✖ 1400°C

4. ✖ 1250°C

Question Number : 189 Question Id : 47720318417 Display Question Number : Yes Is Question Mandatory : No

Pt / Rh thermometers can be used up to _____

Options :

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1. ✖ 1800°C

2. ✔ 1500°C

3. ✖ 1400°C

4. ✖ 1250°C

Question Number : 190 Question Id : 47720318418 Display Question Number : Yes Is Question Mandatory : No

In pyrometric cones _____ no. of cones is placed on the refractory base to measure the softening point.

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 5

Question Number : 191 Question Id : 47720318419 Display Question Number : Yes Is Question Mandatory : No

Amphoteric oxides are_____

Options :

1. ✔ B_2O_3

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2. ✖ Na_2O

3. ✖ K_2O

4. ✖ BaO

Question Number : 192 Question Id : 47720318420 Display Question Number : Yes Is Question Mandatory : No

Al_2O_3 increases the _____ in a glaze

Options :

1. ✖ Melting temperature

2. ✖ Surface tension

3. ✖ Fluidity

4. ✔ Viscosity

Question Number : 193 Question Id : 47720318421 Display Question Number : Yes Is Question Mandatory : No

Lead imparts high _____ in glaze

Options :

1. ✖ Fluidity

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2. ✖ Surface tension

3. ✖ Non toxicity

4. ✔ Brilliance

Question Number : 194 Question Id : 47720318422 Display Question Number : Yes Is Question Mandatory : No

_____ is used for adherence of enamel to substrate

Options :

1. ✖ Magnesium Oxide

2. ✔ Cobalt oxide

3. ✖ Calcium oxide

4. ✖ Potassium oxide

Question Number : 195 Question Id : 47720318423 Display Question Number : Yes Is Question Mandatory : No

The firing temperature of titania opacified enamels is _____

Options :

1. ✖ 600 - 750°C

ZOLLEGE.in

2. ✔ 770 - 830°C

3. ✖ 900 - 950°C

4. ✖ 1000 - 1150°C

Question Number : 196 Question Id : 47720318424 Display Question Number : Yes Is Question Mandatory : No

_____ acts as a deflocculant in most glazes

Options :

1. ✖ Sodium aluminate

2. ✖ Calcium chloride

3. ✔ Carboxyl methyl cellulose

4. ✖ Sodium carbonate

Question Number : 197 Question Id : 47720318425 Display Question Number : Yes Is Question Mandatory : No

About _____% of water is added for the total slip volume

Options :

1. ✖ 30-40

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2. ✖ 40-50

3. ✔ 50-55

4. ✖ 60-75

Question Number : 198 Question Id : 47720318426 Display Question Number : Yes Is Question Mandatory : No

_____ are large bubbles close to the surface of the glaze that destroy the smoothness of the glaze surface

Options :

1. ✔ Blisters

2. ✖ Bubbles

3. ✖ Pin holes

4. ✖ Peeling

Question Number : 199 Question Id : 47720318427 Display Question Number : Yes Is Question Mandatory : No

The defect caused due to thermal expansion mismatch between body and glaze is _____

Options :

1. ✔ Crazing

2. ✖ Blisters

ZOLLEGE.in

3. ✖ Bubbles

4. ✖ Pin holes

Question Number : 200 Question Id : 47720318428 Display Question Number : Yes Is Question Mandatory : No

If the incident beam of light is reflected off the surface at the same angle to the surface as the incident beam, it is called _____

Options :

1. ✖ Specular diffusion

2. ✔ Specular reflection

3. ✖ Specular transmission

4. ✖ Specular absorption

ZOLLEGE.in