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 :	Mining Engineering 22nd July 2022 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 :	722544120
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

Question Number : 1 Question Id : 7225446002 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A=\begin{bmatrix}\cos\theta & -\sin\theta \\ \sin\theta & \cos\theta\end{bmatrix}$ then $A^T+A=I_2$ if

Options :

1. ✖ $\theta=n\pi, n\in Z$

2. ✖ $\theta=(2n+1)\frac{\pi}{2}, n\in Z$

3. ✔ $\theta=2n\pi\pm\frac{\pi}{3}, n\in Z$

4. ✖ $\theta=(2n+1)\frac{\pi}{4}, n\in Z$

Question Number : 2 Question Id : 7225446003 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If for the matrix A, $A^3 = I$ then $A^{-1} =$

Options :

1. ✓ A^2

2. ✗ A^3

3. ✗ A

4. ✗ A^4

Question Number : 3 Question Id : 7225446004 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 λ for which the system of equations
$x+y+z=6$, $x+2y+3z=10$, $x+2y+\lambda z=12$ is inconsistent is

Options :

1. ✗ $\lambda = 1$

2. ✗ $\lambda = 2$

3. ✗ $\lambda = -2$

4. ✔ $\lambda = 3$

Question Number : 4 Question Id : 7225446005 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A=\begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ *then the value of* $|adj\ A|$ *is*

Options :

1. ✘ a^{27}

2. ✘ a^{9}

3. ✔ a^{6}

4. ✘ a^{2}

Question Number : 5 Question Id : 7225446006 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If\ A+2B=\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}\ and\ 2A-B=\begin{bmatrix}2 & -1 & 5\\ 2 & -1 & 6\\ 0 & 1 & 2\end{bmatrix}\ \text{then}\ \ tr(A)-\text{tr}(B)\ \text{value}\ \ \text{equal}$$

to

Options :

1. ✖ 0

2. ✖ 1

3. ✔ 2

3

4. ✖

Question Number : 6 Question Id : 7225446007 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\frac{2x+3}{(x+1)(x-3)}=\frac{a}{(x+1)}+\frac{b}{(x-3)}then\ \ 2a+3b=$$

Options :

1. ✖ 14

2. ✖ 12

3. ✔ $25/4$

4. ✖ -12

Question Number : 7 Question Id : 7225446008 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 partial fractions of $\frac{3x^2+70x+93}{(x-1)^4}$ *is*

Options :

1. ✔ 3

2. ✖ 4

3. ✖ 5

4. ✖ 2

Question Number : 8 Question Id : 7225446009 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Given that $A=\sin^2\theta+\cos^4\theta$, *then for all real values of* θ

Options :

1. ✖ $1 \leq A \leq 2$

2. ✔ $\frac{3}{4} \leq A \leq 1$

3. ✖ $\frac{13}{16} \leq A \leq 1$

4. ✖ $\frac{3}{4} \leq A \leq \frac{13}{16}$

Question Number : 9 Question Id : 7225446010 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$If \tan\theta = -\frac{4}{3}$,*then* $\sin\theta =$

Options :

1. ✖ $-\frac{4}{5}$ *but not* $\frac{4}{5}$

2. ✔ $-\frac{4}{5}$ *or* $\frac{4}{5}$

3. ✖ $\frac{4}{5}$ *but not* $-\frac{4}{5}$

4. ✖ $-\frac{3}{5}$ *but not* $\frac{3}{5}$

Question Number : 10 Question Id : 7225446011 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

$\sin x - 3\sin 2x + \sin 3x = \cos x - 3\cos 2x + \cos 3x$ *is*

Options :

1. ✖ $n\pi + \frac{\pi}{8}$

2. ✔ $\frac{n\pi}{2} + \frac{\pi}{8}$

3. ✖ $(-1)^n \frac{n\pi}{2} + \frac{\pi}{8}$

4. ✖ $2n\pi + \cos^{-1}\frac{3}{2}$

Question Number : 11 Question Id : 7225446012 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If x, y, z *are in AP and* $\tan^{-1} x, \tan^{-1} y$ and $\tan^{-1} z$ *are also in AP then*

Options :

1. ✓ $x = y = z$

2. ✗ $2x = 3y = 6z$

3. ✗ $6x = 3y = 2z$

4. ✗ $6x = 4y = 3z$

Question Number : 12 Question Id : 7225446013 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$ *then* $x =$

Options :

1. ✓ $\frac{1}{6}$

2. ✖ $\frac{1}{3}$

3. ✖ $\frac{1}{2}$

4. ✖ $\frac{3}{2}$

Question Number : 13 Question Id : 7225446014 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sides of a triangle are in the ratio $1:\sqrt{3}:2$ then the angles of the triangle are in the ratio

Options :

1. ✖ $1:3:5$

2. ✖ $2:3:2$

3. ✖ $3:2:1$

4. ✔ $1:2:3$

Question Number : 14 Question Id : 7225446015 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$Let\ \cos(\alpha+\beta)=\frac{4}{5}\ and\ \sin(\alpha-\beta)=\frac{5}{13}\ where\ 0<\alpha,\beta\le\frac{\pi}{4},\ then\ \tan 2\alpha=$$

Options :

1. ✖ $\frac{19}{12}$

2. ✖ $\frac{20}{7}$

3. ✖ $\frac{25}{16}$

4. ✔ $\frac{56}{33}$

Question Number : 15 Question Id : 7225446016 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If\ 1+\sin x+\sin^2 x+\sin^3 x+....\infty\ =4+2\sqrt{3}\ ,\quad 0<x<\pi,\ then\ x=$$

Options :

1. ✖ $\frac{\pi}{6}$

2. ✖ $\frac{\pi}{4}$

3. ✔ $\frac{2\pi}{3}$

4. ✖ $\frac{3\pi}{4}$

Question Number : 16 Question Id : 7225446017 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The angles of a triangle are in the ratio 3:5:10 then the ratio of the smallest side to the greatest side is

Options :

1. ✖ $1:\sin 10^\circ$

2. ✖ $1:\ 2\sin 10^\circ$

3. ✖ $1:\cos 10^\circ$

4. ✔ $1:\ 2\cos 10^\circ$

Question Number : 17 Question Id : 7225446018 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If\ \sin^{-1}x+\sin^{-1}y=\frac{2\pi}{3}\ then\ \cos^{-1}x+\cos^{-1}y=$$

Options :

1. ✗ $\frac{2\pi}{3}$

2. ✓ $\frac{\pi}{3}$

3. ✗ $\frac{\pi}{6}$

4. ✗ π

Question Number : 18 Question Id : 7225446019 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The conjugate of a complex number is $\frac{1}{i-1}$, then that complex number is

Options :

1. ✔ $\frac{-1}{i+1}$

2. ✖ $\frac{1}{i-1}$

3. ✖ $\frac{-1}{i-1}$

4. ✖ $\frac{1}{i+1}$

Question Number : 19 Question Id : 7225446020 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 $\frac{(\sin\ \pi/8 + i\cos\ \pi/8)^8}{(\sin\ \pi/8 - i\cos\ \pi/8)^8} =$

Options :

1. ✖ -1

2. ✖ 0

3. ✔ 1

4. ✖ $2i$

Question Number : 20 Question Id : 7225446021 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The lines $2x-3y-5=0$ *and* $3x-4y=7$ *are diameters of a circle of area* 49π *sq.units, then the equation of the circle is*

Options :

1. ✖ $x^2+y^2+2x-2y-62=0$

2. ✖ $x^2+y^2+2x-2y-47=0$

3. ✔ $x^2+y^2-2x+2y-47=0$

4. ✖ $x^2+y^2-2x+2y-62=0$

Question Number : 21 Question Id : 7225446022 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the point $(a,-a)$ *lies inside the circle* $x^2+y^2-4x+2y-8=0$, then 'a' *lies in the* interval

Options :

1. ✓ $(-1,4)$

2. ✗ $(-\infty,-1)$

3. ✗ $(4,\infty)$

4. ✗ $[-1,4]$

Question Number : 22 Question Id : 7225446023 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The focus of the parabola $y^2-4y-8x+4=0$ *is*

Options :

1. ✗ $(1,1)$

2. ✗ $(1,2)$

3. ✗ $(2,1)$

4. ✔ $(2,2)$

Question Number : 23 Question Id : 7225446024 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equation $\frac{x^2}{10-a}+\frac{y^2}{4-a}=1$ *represents an ellipse if*

Options :

1. ✔ $a<4$

2. ✖ $a>4$

3. ✖ $4<a<10$

4. ✖ $a>10$

Question Number : 24 Question Id : 7225446025 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The vertices of the hyperbola $9x^2-16y^2-36x+96y-252=0$, *are*

Options :

1. ✖ $(6,3)$ *and* $(-6,3)$

2. ✔ $(6,3)$ *and* $(-2,3)$

3. ✖ $(-6,3)$ *and* $(-6,-3)$

4. ✖ $(0, \pm\frac{2}{3})$

Question Number : 25 Question Id : 7225446026 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eccentricity of the hyperbola with latus rectum 12 *and semi conjugate axis* $2\sqrt{3}$ *is*

Options :

1. ✔ 2

2. ✖ 3

3. ✖ $\sqrt{3}/2$

4. ✖ $2\sqrt{3}$

Question Number : 26 Question Id : 7225446027 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The side of an equilateral triangle expands at the rate of 2 cm/sec, the rate of increase of its area when each side is 10 cm (in cm^2/sec)

Options :

1. ✗ $10\sqrt{2}$

2. ✗ $10\sqrt{3}$

3. ✓ 10

4. ✗ 5

Question Number : 27 Question Id : 7225446028 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x+y) = f(x)\,f(y)$, for all x,y. $f(5) = 2$, $f'(0)=3$, then $f'(5)=$

Options :

1. ✓ 6

2. ✗ 2

3. ✗ 3

4. ✖ 5

Question Number : 28 Question Id : 7225446029 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\lim_{x\to\infty}\left[\frac{x^2+2x-1}{2x^2-3x-2}\right]^{\frac{2x+1}{2x-1}} \text{ is equal to}$$

Options :

1. ✖ 0

2. ✖ ∞

3. ✔ 1/2

4. ✖ 1/3

Question Number : 29 Question Id : 7225446030 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$\lim_{x\to 0}\frac{\sin^2 mx}{\tan^2 nx} \text{ is equal to}$$

Options :

1. ✖ m/n

2. ✗ $m^2.n^2$

3. ✓ m^2/n^2

4. ✗ n^2/m^2

Question Number : 30 Question Id : 7225446031 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$If\ \ f(x)=\left|x^2-5x+6\right|\ \ then\ \ f'(x)=$

Options :

1. ✗ $2x-5 \quad for\ \ 2<x<3$

2. ✓ $5-2x \quad for\ \ 2<x<3$

3. ✗ $2x-5 \quad for\ \ x>2$

4. ✗ $5-2x \quad for\ \ x<3$

Question Number : 31 Question Id : 7225446032 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{1}{x(1+\log y)}$

2. ✘ $\frac{1}{x+\log y}$

3. ✘ $\frac{1}{\log x(1+y)}$

4. ✘ $\frac{1}{y+\log x}$

Question Number : 32 Question Id : 7225446033 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 tangents *to the curve* $y = x^2 - 5x + 6$ *at the* points $(2,0)$ and $(3,0)$ is

Options :

1. ✖ $\frac{\pi}{3}$

2. ✔ $\frac{\pi}{2}$

3. ✖ $\frac{\pi}{6}$

4. ✖ $\frac{\pi}{4}$

Question Number : 33 Question Id : 7225446034 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If errors of 1% *is made in the base radius and height of a cylinder then the percentage error in its volume is*

Options :

1. ✖ 1%

2. ✖ 2%

3. ✔ 3%

4. ✖ 4%

Question Number : 34 Question Id : 7225446035 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$The\ value\ of\ 'a'\ for\ which\ the\ function\ f(x) = a\sin x + \frac{1}{3}\sin 3x$$

$$has\ \ an\ \ extremum\ \ at\ x = \frac{\pi}{3}\ is$$

Options :

1. ✖ 1

2. ✖ -1

3. ✖ 0

4. ✔ 2

Question Number : 35 Question Id : 7225446036 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $x^{y-1}(1+x\log y)$

2. ✖ $y^{x-1}(1+y\log x)$

3. ✔ $x^{y-1}(1+y\log x)$

4. ✖ $x^{y+1}(1-y\log x)$

Question Number : 36 Question Id : 7225446037 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$The value of \int e^{\sin^{-1}x}\frac{1}{\sqrt{1-x^2}}dx$$

Options :

1. ✖ $2e^{\sin^{-1}x}+c$

2. ✔ $e^{\sin^{-1}x}+c$

3. ✖ $e^{\sin x}+c$

4. ✖ $e^{\cos^{-1}x}+c$

Question Number : 37 Question Id : 7225446038 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If \int \frac{4x+1}{x^2+3x+2}dx = a\log|x+1| + b\log|x+2| + C, \text{ then}$$

Options :

1. ✖ $a = b$

2. ✔ $a + b = 4$

3. ✖ $a = 2b$

4. ✖ $b = 2a$

Question Number : 38 Question Id : 7225446039 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ $-\frac{1}{\sin x + \cos x} + c$

2. ✔ $\log|\sin x+\cos x|+c$

3. ✖ $\log|\sin x-\cos x|+c$

4. ✖ $(\sin x+\cos x)^2+c$

Question Number : 39 Question Id : 7225446040 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$If\ \int f(x)dx=2(f(x))^3+C\ \ then\ \ f(x)=$

Options :

1. ✖ $\frac{x}{2}$

2. ✖ x^3

3. ✖ $\frac{1}{\sqrt{x}}$

4. ✔ $\sqrt{\frac{x}{3}}$

Question Number : 40 Question Id : 7225446041 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If \int e^{ax}\cos bx\ dx = \frac{e^{2x}}{29}f(x)+C,\ then\ f''(x) =$$

Options :

1. ✗ $29f(x)$

2. ✗ $-29f(x)$

3. ✗ $25f(x)$

4. ✓ $-25f(x)$

Question Number : 41 Question Id : 7225446042 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$The\ value\ of\ x\ in \int_{\sqrt{2}}^{x} \frac{1}{t\sqrt{t^2-1}}dt = \frac{\pi}{2}\ is$$

Options :

1. ✗ $\frac{\sqrt{3}}{2}$

2. ✖ $2\sqrt{2}$

3. ✖ 2

4. ✔ $-\sqrt{2}$

Question Number : 42 Question Id : 7225446043 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 $\int_0^1 \frac{(\sin^{-1} x)^2}{\sqrt{1-x^2}} dx$

Options :

1. ✔ $\frac{\pi^3}{24}$

2. ✖ $\frac{\pi^3}{48}$

3. ✖ $\frac{\pi^3}{64}$

4. ✖ $\frac{\pi^3}{12}$

Question Number : 43 Question Id : 7225446044 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$If\ f(x)\ is\ a\ polynomial\ of$ degree 2 $satisfying\ f(0)=1,$

$f'(0)=-2\ and\ f''(0)=6\ then \int_{-1}^{2} f(x)dx =$

Options :

1. ✖ 6

2. ✖ 0

3. ✔ 9

4. ✖ -8

Question Number : 44 Question Id : 7225446045 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The degree of the differential equation $a^2\frac{d^2y}{dx^2}=\left[1+\left(\frac{dy}{dx}\right)^2\right]^{3/2}$ *is*

Options :

1. ✔ 2

2. ✖ 1

3. ✖ 3

4. ✖ 4

Question Number : 45 Question Id : 7225446046 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$\log\left(\frac{y}{x}\right) = cx$, where c is abitrary constant is a solution of the differential equation

Options :

1. ✔ $\log\left(\frac{y}{x}\right) = \frac{x}{y}\frac{dy}{dx} - 1$

2. ✖ $\log\left(\frac{x}{y}\right) = \frac{x}{y}\frac{dy}{dx} - 1$

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

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

Question Number : 46 Question Id : 7225446047 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 $\cos\theta\, dr - r\sin\theta\, d\theta = 0$ *is*

Options :

1. ✓ $r\cos\theta = c$, $c-$arbitrary constant

2. ✗ $r\sin\theta = c$, $c-$arbitrary constant

3. ✗ $r\cos\theta + r\sin\theta = c$, $c-$arbitrary constant

4. ✗ $r^2\cos 2\theta = c$, $c-$arbitrary constant

Question Number : 47 Question Id : 7225446048 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The degree of $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^2 = x\sin\frac{dy}{dx}$ is

Options :

1. ✗ 1

2. ✗ 2

3. ✗ 3

4. ✓ Not defined

Question Number : 48 Question Id : 7225446049 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The complimenary function of the differential equation $\frac{d^2y}{dx^2}+4\frac{dy}{dx}+3y=e^{2x}$ *is*

Options :

1. ✗ $x=c_1e^{-y}+c_2e^{-3y}$, c_1,c_2-arbitrary constants

2. ✓ $y=c_1e^{-x}+c_2e^{-3x}$, c_1,c_2-arbitrary constants

3. ✗ $y=c_1e^{x}+c_2e^{3x}$, c_1,c_2-arbitrary constants

4. ✗ $x=c_1e^{y}+c_2e^{3y}$, c_1,c_2-arbitrary constants

Question Number : 49 Question Id : 7225446050 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 $(D^2+4)y=\cos 2x$ *is*

Options :

1. ✗ $-\frac{1}{2}x\sin 2x$

2. ✖ $\frac{1}{2}x\sin 2x$

3. ✖ $-\frac{1}{4}x\cos 2x$

4. ✔ $\frac{1}{4}x\sin 2x$

Question Number : 50 Question Id : 7225446051 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 of the equation $x^2y\,dx-(x^3+y^3)dy=0$ *is*

Options :

1. ✖ $-\frac{1}{x^4}$

2. ✖ $\frac{1}{x^4}$

3. ✖ $\frac{1}{y^4}$

4. ✔ $-\frac{1}{y^4}$

Physics

Section Id :	722544121
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

Question Number : 51 Question Id : 7225446052 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Parsec is the unit of

Options :

1. ✖ Time

2. ✔ Distance

3. ✖ Frequency

4. ✖ Angular acceleration

Question Number : 52 Question Id : 7225446053 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following pairs, which pair does not have identical dimensions

Options :

1. ✓ Moment of inertia and moment of a force

2. ✗ Work and torque

3. ✗ Angular momentum and Planck's constant

4. ✗ Impulse and momentum

Question Number : 53 Question Id : 7225446054 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One of the two forces is double the other and their resultant is equal to the greater force.

The angle between them is

Options :

1. ✗ $\cos^{-1}(1/2)$

2. ✗ $\cos^{-1}(-1/2)$

3. ✗ $\cos^{-1}(1/4)$

4. ✔ $\cos^{-1}(-1/4)$

Question Number : 54 Question Id : 7225446055 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If three vectors $\vec{A} = \hat{\imath} - 2\hat{\jmath} + 3\hat{k}$, $\vec{B} = x\hat{\imath} + 3\hat{k}$ and $\vec{C} = 7\hat{\imath} + 3\hat{\jmath} - 11\hat{k}$ are coplanar, then

the value of x is

Options :

1. ✖ 36/21

2. ✔ -51/13

3. ✖ 51/32

4. ✖ -36/21

Question Number : 55 Question Id : 7225446056 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 allowed to fall from a height of 100 m. The time taken for the first 50 m is t_1

and for the remaining 50 m is t_2, then

Options :

1. ✖ $t_1 = t_2$

2. ✓ $t_1 > t_2$

3. ✗ $t_1 < t_2$

4. ✗ Depends upon the mass

Question Number : 56 Question Id : 7225446057 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✗ 336

2. ✗ 224

3. ✗ 56

4. ✓ 34

Question Number : 57 Question Id : 7225446058 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cricket ball is thrown at a speed of 28 ms^{-1} in a direction 30° above the horizontal. The time taken by the ball to return to the same level in seconds is

Options :

1. ✓ 2.9

2. ✗ 3.9

3. ✗ 1.9

4. ✗ 2

Question Number : 58 Question Id : 7225446059 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum height of a projectile is half of its range on the horizontal. If the velocity of the projection is u, then its range on the horizontal is

Options :

1. ✗ $\frac{2u^2}{5g}$

2. ✗ $\frac{3u^2}{5g}$

3. ✖ $\frac{u^2}{g}$

4. ✔ $\frac{4u^2}{5g}$

Question Number : 59 Question Id : 7225446060 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cubical block rests on an inclined plane of coefficient of friction $\mu = \frac{1}{\sqrt{3}}$. What should be the angle of inclination so that the block just slides down the inclined plane?

Options :

1. ✔ $30°$

2. ✖ $60°$

3. ✖ $45°$

4. ✖ $90°$

Question Number : 60 Question Id : 7225446061 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the equilibrium of a body on an inclined plane of inclination 45°, the coefficient of static friction will be

Options :

1. ✓ Greater than one

2. ✗ Zero

3. ✗ Less than one

4. ✗ Less than zero

Question Number : 61 Question Id : 7225446062 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The displacement x and time t for a particle are related to each other as $t = \sqrt{x} + 3$. The work done in first six seconds of its motion is

Options :

1. ✗ 6 J

2. ✓ Zero

3. ✗ 4 J

4. ✗ 2 J

Question Number : 62 Question Id : 7225446063 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A particle move with a velocity $v = (5\hat{\imath} - 3\hat{\jmath} + 6\hat{k})$ m/s under the influence of a constant force $\vec{F} = 10\hat{\imath} + 10\hat{\jmath} + 20\hat{k}$. The instantaneous power applied to the particle is

Options :

1. ✗ 200 J/sec

2. ✗ 40 J/sec

3. ✓ 140 J/sec

4. ✗ 170 J/sec

Question Number : 63 Question Id : 7225446064 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main source of solar energy is

Options :

1. ✗ Nuclear fission

2. ✓ Nuclear fusion

3. ✗ Gravitational contraction

4. ✗ Combustion

Question Number : 64 Question Id : 7225446065 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The particle executing the simple harmonic motion passes through the mean position. It has

Options :

1. ✗ Minimum kinetic energy and maximum potential energy

2. ✓ Maximum kinetic energy and minimum potential energy

3. ✗ Maximum kinetic energy and maximum potential energy

4. ✗ Minimum kinetic energy and minimum potential energy

Question Number : 65 Question Id : 7225446066 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simple pendulum has a time period T_1 on the earth's surface and T_2 at a height of R above the earth's surface, where R is the radius of the earth. The value of T_2/T_1 is

Options :

1. ✗ 1

2. ✗ 4

3. ✗ $\sqrt{2}$

4. ✓ 2

Question Number : 66 Question Id : 7225446067 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 not a characteristic of musical sound?

Options :

1. ✗ Quality

2. ✗ Pitch

3. ✓ Wavelength

4. ✗ Loudness

Question Number : 67 Question Id : 7225446068 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Doppler shift in frequency does not depend upon

Options :

1. ✗ The actual frequency of the wave

2. ✓ The distance of the source from the listener

3. ✗ The velocity of the source

4. ✗ The velocity of the observer

Question Number : 68 Question Id : 7225446069 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Inaudibility limit is around

Options :

1. ✗ One-hundredth of the initial intensity

2. ✗ One-tenth of the initial intensity

3. ✗ One-thousandth of the initial intensity

4. ✓ One-millionth of the initial intensity

Question Number : 69 Question Id : 7225446070 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An ideal gas at 27°C is compressed adiabatically to 8/27 of its original volume. If $\gamma = 5/3$, then the rise in temperature is

Options :

1. ✗ 450K

2. ✓ 375K

3. ✗ 225K

4. ✗ 405K

Question Number : 70 Question Id : 7225446071 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 provided with 200 calories of heat and the work done by the system on the surrounding is 40 J. Then its internal energy

Options :

1. ✖ Increases by 600 J

2. ✖ Decreases by 800 J

3. ✔ Increases by 800 J

4. ✖ Decreases by 50J

Question Number : 71 Question Id : 7225446072 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The temperature of n moles of an ideal gas is increased from T to 4Tthrough a process for which pressure $P = a T^{-1}$where a is a constant. Then the work done by the gas is

Options :

1. ✖ nRT

2. ✖ $4nRT$

3. ✖ $2nRT$

4. ✔ $6nRT$

Question Number : 72 Question Id : 7225446073 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When an ideal gas with pressure P and volume V is compressed isothermally to one fourth of its volume, the pressure is P_1. When the same gas is compressed polytropically according to the equation $PV^{1.5}$ = constant to one fourth of its initial volume, the pressure is P_2. The ratio of P_2/P_1 is

Options :

1. ✗ $\frac{1}{2}$

2. ✗ $\frac{1}{2^{1.5}}$

3. ✓ 2

4. ✗ $2^{1.5}$

Question Number : 73 Question Id : 7225446074 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A Carnot engine whose efficiency is 40%, receives heat at 500K. If the efficiency is to be 50%, the source temperature for the same exhaust temperature is

Options :

1. ✗ 900 K

2. ✔ 600 K

3. ✖ 700 K

4. ✖ 800 K

Question Number : 74 Question Id : 7225446075 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Optical fibers carry very large information compared to copper cables because of their

Options :

1. ✖ Large thickness

2. ✔ Extremely wide bandwidth

3. ✖ Extremely less bandwidth

4. ✖ Light weight

Question Number : 75 Question Id : 7225446076 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A superconductor is a perfect …….. material.

Options :

1. ✔ Diamagnetic

2. ✖ Dielectric

3. ✖ Insulating

4. ✖ Semiconducting

Chemistry

Section Id :	722544122
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

Question Number : 76 Question Id : 7225446077 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 not a characteristic of Plank's theory radiation?

Options :

1. ✗ Energy is always associated with radiations

2. ✓ The absorption and emission of energy occur continuously and not in small packets of energy called quanta

3. ✗ The energy associated with a quantum of radiation is directly proportional to its frequency

4. ✗ The emission and absorption of energy takes place in small packets called quanta

Question Number : 77 Question Id : 7225446078 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The atomic number of calcium is 20 and mass number is 40, it contains

Options :

1. ✓ 20 protons, 20 electrons and 20 neutrons

2. ✗ 20 protons, 20 electrons and 22 neutrons

3. ✗ 20 protons, 20 electrons and 40 neutrons

4. ✗ 40 protons, 20 electrons and 20 neutrons

Question Number : 78 Question Id : 7225446079 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which molecule among the following obeys the octet rule?

Options :

1. ✗ PF_5

2. ✗ NO

3. ✗ ClO_2

4. ✓ O_2

Question Number : 79 Question Id : 7225446080 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one among the following has higher ionic radius?

Options :

1. ✓ C^{4-}

2. ✗ N^{3-}

3. ✗ O^{2-}

4. ✗ Na^+

Question Number : 80 Question Id : 7225446081 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

0.2 equivalents of H_2SO_4 is present in 100 mL of the solution. What is its normality?

Options :

1. ✗ 1 N

2. ✓ 2 N

3. ✗ 4 N

4. ✗ 20 N

Question Number : 81 Question Id : 7225446082 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which ion is isoelectronic with CO?

Options :

1. ✓ CN^-

2. ✗ O_2^+

3. ✖ O_2^-

4. ✖ N_2^+

Question Number : 82 Question Id : 7225446083 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

20 mL of 0.01 M HCl solution is diluted to 100 mL What is the molarity of final solution?

Options :

1. ✖ 0.02 M

2. ✔ 0.002 M

3. ✖ 0.05 M

4. ✖ 0.001 M

Question Number : 83 Question Id : 7225446084 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many moles of HCl are required to react with completely with 2 moles of Na_2CO_3?

Options :

1. ✗ 1

2. ✗ 2

3. ✗ 3

4. ✓ 4

Question Number : 84 Question Id : 7225446085 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one among the following is a Lewis acid and also Bronsted acid?

Options :

1. ✗ CO_2

2. ✗ $AlCl_3$

3. ✓ H^+

4. ✗ Cu^{2+}

Question Number : 85 Question Id : 7225446086 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 pH of 0.01 M NaOH solution?

Options :

1. ✖ 2

2. ✖ 8

3. ✖ 10

4. ✔ 12

Question Number : 86 Question Id : 7225446087 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Four alkali metals A, B, C and D are having standard electrode potentials as -3.05, - 1.66, -0.40 and 0.80 V respectively. Which one will be most reducing?

Options :

1. ✔ A

2. ✖ B

3. ✖ C

4. ✖ D

Question Number : 87 Question Id : 7225446088 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one among the following is used as depolarizer in dry cell battery?

Options :

1. ✖ Ammonium chloride

2. ✖ Potassium hydroxide

3. ✔ Manganese dioxide

4. ✖ Sodium phosphate

Question Number : 88 Question Id : 7225446089 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How much copper is deposited when 2 Faraday of electricity is passed through a $CuSO_4$ solution? (Cu atomic weight = 63.54)

Options :

1. ✖ 31. 77 g

2. ✖ 159.54 g

127.77 g

3. ✗

63.54 g

4. ✓

Question Number : 89 Question Id : 7225446090 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 cell potential for the following cell at 298 K?
$Mg(s) \mid Mg^{2+}(0.001M) \parallel Cu^{2+}(0.0001M) \mid Cu(s)$
Given E_0 of $Cu^{2+}|Cu = 0.34$ V and E_0 of $Mg^{2+} \mid Mg = -2.37$ V

Options :

1. ✗ 1.34 V

2. ✓ 2.68 V

3. ✗ 0.268 V

4. ✗ 0.134 V

Question Number : 90 Question Id : 7225446091 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hard water sample contains the following ions/salts. Which water sample is more in hardness?

Options :

1. ✗ 100 grams of $CaCO_3$ per litre

2. ✗ 50 equivalents of Ca^{2+} ions per litre

3. ✓ 20 moles of $CaCO_3$ per litre

4. ✗ 20 moles of $MgCO_3$ per litre

Question Number : 91 Question Id : 7225446092 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

20 ml of hard water required 10 ml of EDTA solution. The hardness of water sample is 1000 ppm. What is the molarity of EDTA?

Options :

1. ✓ 0.02 M

2. ✗ 0.03 M

3. ✗ 0.005 M

4. ✗ 0.05 M

Question Number : 92 Question Id : 7225446093 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hardness of water sample is 500 ppm. What is the weight of $MgSO_4$ present in it, assume that the hardness is only due to the presence of magnesium sulphate.

Options :

1. ✗ 0.3 g

2. ✗ 1.2 g

3. ✓ 0.6 g

4. ✗ 0.01 g

Question Number : 93 Question Id : 7225446094 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rate of corrosion is high if

Options :

1. ✓ Anodic areas are small and cathodic areas are large

2. ✗ Anodic areas are large and cathodic areas are small

3. ✗ Both anodic and cathodic areas are large

4. ✖ Does not depend upon the area of anode and cathode

Question Number : 94 Question Id : 7225446095 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In electroplating, the metal to be coated or electroplated is made of

Options :

1. ✖ Anode

2. ✔ Cathode

3. ✖ Both anode and cathode

4. ✖ Inert metal

Question Number : 95 Question Id : 7225446096 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 not a thermosetting plastic?

Options :

1. ✖ Bakelite

2. ✖ Melamine

3. ✗ Epoxy resins

4. ✓ Teflon

Question Number : 96 Question Id : 7225446097 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following molecule contains the functionality TWO?

Options :

1. ✗ 1, 2-Dihydroxy benzene

2. ✗ Benzene

3. ✗ Phenol

4. ✓ Ethylene

Question Number : 97 Question Id : 7225446098 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 not a synthetic rubber?

Options :

1. ✗ Buna-S

2. ✖ Buna-N

3. ✖ Neoprene

4. ✔ 1, 4-Polyisoprene

Question Number : 98 Question Id : 7225446099 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 not a renewable source of energy?

Options :

1. ✖ Solar energy

2. ✖ Wind Energy

3. ✔ Petrol

4. ✖ Hydro energy

Question Number : 99 Question Id : 7225446100 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one among the following is not a greenhouse gas?

Options :

1. ✖ CH_4

2. ✖ Water vapour

3. ✖ Chlorofluoro carbons

4. ✔ SO_2

Question Number : 100 Question Id : 7225446101 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one is responsible for the depletion of ozone layer?

Options :

1. ✖ Carbon free radical

2. ✖ Oxygen free radical

3. ✔ Chlorine free radical

4. ✖ Fluorine free radical

Mining Engineering

Section Id :	722544123
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

Question Number : 101 Question Id : 7225446102 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The device is used for lowering or raising the drill rods of square cross section is known as

Options :

1. ✗ Buldog safety clamp

2. ✓ Retaining key

3. ✗ Auger

4. ✗ Chisel

Question Number : 102 Question Id : 7225446103 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following drills is used for placer deposits?

Options :

1. ✖ Diamond drilling

2. ✖ Percussive drilling

3. ✔ Churn drilling

4. ✖ Calyx drilling

Question Number : 103 Question Id : 7225446104 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:

A. NX	1. 40 mm
B. BX	2. 21 mm
C. AX	3. 54 mm
D. EX	4. 28 mm

Options :

1. ✖ A-1, B-2, C-4, D-3

2. ✔ A-3, B-1, C-4, D-2

3. ✖ A-4, B-2, C-1, D-3

4. ✖ A-4, B-3, C-1, D-2

Question Number : 104 Question Id : 7225446105 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The measurement of borehole deviation is known as

Options :

1. ✗ Exploration

2. ✓ Borehole survey

3. ✗ Compass survey

4. ✗ Chain survey

Question Number : 105 Question Id : 7225446106 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Device used to prevent the undue swinging of the bucket during its travel in a shaft, in addition to the locked coil rope is:

Options :

1. ✗ Scaffold

2. ✓ Rider

3. ✗ Detaching hook

4. ✗ Core barrel

Question Number : 106 Question Id : 7225446107 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A deposit with highest stripping ratio can be economically worked by the following HEMM

Options :

1. ✗ Shovel

2. ✗ Ripper-Dozer

3. ✗ BWE

4. ✓ Dragline

Question Number : 107 Question Id : 7225446108 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A coal seam lying at 200 m depth being developed with shovel and dumper combination. The stripping ratio of the mine is 1:7 t/m^3. The amount of overburden to be removed for mining 1 lakh tones (Lt) is

Options :

1. ✗ $10\ Lm^3$

2. ✗ $9\ Lm^3$

3. ✗ $8\ Lm^3$

4. ✓ $7\ Lm^3$

Question Number : 108 Question Id : 7225446109 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A bench area of 200 m X 20 m is being blasted with 10 m long holes having 150 mm diameter. The explosive consumed is 8,000 kg. Then powder factor is

Options :

1. ✗ $10\ m^3/kg$

2. ✗ $7.5\ m^3/kg$

3. ✓ $5\ m^3/kg$

4. ✗ $3\ m^3/kg$

Question Number : 109 Question Id : 7225446110 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When the part of explosive charge remains unblasted in the hole even after blasting, such charge of hole is known as?

Options :

1. ✗ Socket

2. ✓ Misfire

3. ✗ Sleep hole

4. ✗ Hang fire

Question Number : 110 Question Id : 7225446111 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A gas mixture contains A, B and C gases having concentration of 55%, 25% and 20%. The explosibility limit of A, B and C gases are 15%, 5% and 10% respectively. Then lower explosibility limit of gas mixture is

Options :

1. ✗ 10

2. ✗ 8.38

3. ✓ 9.38

4. ✗ 0.1

Question Number : 111 Question Id : 7225446112 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The base charge in delay detonator is

Options :

1. ✗ Potassium dichromate

2. ✗ ASA

3. ✓ PETN

4. ✗ Ammonium Nitrate

Question Number : 112 Question Id : 7225446113 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Arrange the following gases according to their occurrences from floor to roof

A. O_2

B. CO

C. H_2

D. CO_2

E. SO_2

Options :

1. ✗ CBADE

2. ✓ EDABC

3. ✗ CDABE

4. ✗ EBADC

Question Number : 113 Question Id : 7225446114 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most suitable mining method adopted to protect the structures lying on the surface is

Options :

1. ✗ Longwall

2. ✓ B&P with stowing

3. ✗ B&P with caving

4. ✗ Shortwall

Question Number : 114 Question Id : 7225446115 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Relationship between weathering and durability of rock mass

Options :

1. ✔ Inversely proportional

2. ✖ Directly proportional

3. ✖ Equal

4. ✖ No relation

Question Number : 115 Question Id : 7225446116 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Arrange the following minerals in the descending order as per their hardness.

A. Quartz
B. Orthoclase
C. Fluorite
D. Apatite

Options :

1. ✖ DCBA

2. ✖ ABCD

3. ✔ ABDC

4. ✗ BCDA

Question Number : 116 Question Id : 7225446117 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following rock is metamorphic?

Options :

1. ✓ Marble

2. ✗ Dolerite

3. ✗ Granite

4. ✗ Dolomite

Question Number : 117 Question Id : 7225446118 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Select minerals from the following ores

A. Sphalerite	1. Iron
B. Bauxite	2. Lead
C. Hematite	3. Zinc
D. Galena	4. Aluminium

Options :

1. ✗ A-2, B-4, C-3, D-1

2. ✓ A-3, B-4, C-1, D-2

3. ✗ A-2, B-4, C-1, D-3

4. ✗ A-1, B-4, C-3, D-2

Question Number : 118 Question Id : 7225446119 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mineral used for manufacturing cement is

Options :

1. ✗ Lead

2. ✗ Zinc

3. ✓ Limestone

4. ✗ Uranium

Question Number : 119 Question Id : 7225446120 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The angle made by the fault plane with the vertical is

Options :

1. ✖ Dip

2. ✖ Heave

3. ✔ Hade

4. ✖ Throw

Question Number : 120 Question Id : 7225446121 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

GIS full form

Options :

1. ✖ Geological Information System

2. ✖ Global Information System

3. ✖ Group Information System

4. ✔ Geographical Information System

Question Number : 121 Question Id : 7225446122 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The first stage of mining operation/mine planning is

Options :

1. ✗ Exploration

2. ✓ Prospecting

3. ✗ Exploitation

4. ✗ Reclamation

Question Number : 122 Question Id : 7225446123 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The porosity and void ratio of rocks are P and V respectively. Then,

Options :

1. ✗ $P>V$

2. ✓ $P<V$

3. ✗ $P=V$

4. ✗ P-V>0

Question Number : 123 Question Id : 7225446124 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 copper is

Options :

1. ✗ Bauxite

2. ✗ Hematite

3. ✓ Chalcopyrite

4. ✗ Galena

Question Number : 124 Question Id : 7225446125 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The formation of coal in India is based on which theory

Options :

1. ✗ Pressure arch

2. ✓ Drift

3. ✗ Beam

4. ✗ Insitu

Question Number : 125 Question Id : 7225446126 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per ISRM standard, the recommended ratio of thickness to diameter of the rock sample for determining tensile strength of the sample by Brazilian method is

Options :

1. ✓ 1 : 2

2. ✗ 2 : 1

3. ✗ 1 : 2.5 to 3.0

4. ✗ 1 : 1

Question Number : 126 Question Id : 7225446127 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A coal seam driven by the series of galleries along level and dip directions to form the pillar is known as

Options :

1. ✗ Depillaring

2. ✗ Splitting

3. ✗ Slice

4. ✓ Development

Question Number : 127 Question Id : 7225446128 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A seam of 3 m thick is developed with gallery of 5 m x 3m size and pillar of 45 m x 45 m from centre to centre. Then percentage of extraction during development is

Options :

1. ✗ 31

2. ✓ 21

3. ✗ 19

4. ✗ 18

Question Number : 128 Question Id : 7225446129 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In depillaring workings, it is proposed to extract the pillar of 40 m (centre to centre) with 4.2 m wide slices/galleries leaving a rib of 2 m between two slices. Then, total number of slices in a stook are

Options :

1. ✖ 3

2. ✖ 4

3. ✔ 5

4. ✖ 7

Question Number : 129 Question Id : 7225446130 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fall observed in the workings and cracks extends till the surface is known as

Options :

1. ✖ Local fall

2. ✖ Air blast

3. ✔ Main fall

4. ✖ Periodic weighting

Question Number : 130 Question Id : 7225446131 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A slice of 5 m x 3 m x 20 m size being filled with stowing material at a discharge rate of 20 m^3/hr. Number of hours required to fill the void is

Options :

1. ✓ 15

2. ✗ 20

3. ✗ 25

4. ✗ 40

Question Number : 131 Question Id : 7225446132 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A longwall face of 250 m width and 2500 m length being excavated with DERD shearer. The width and height of the drum are 0.80 m and 1.5 m. Number of cuts required to complete the panel are

Options :

1. ✗ 2000

2. ✗ 2125

3. ✗ 3000

4. ✓ 3125

Question Number : 132 Question Id : 7225446133 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A coal seam is depillared by bord and pillar mining method using LHD technology. The size of face is 4.2 m x 3 m, the hole length is 1.8 m and pull per blast is 1.0 m. The amount of coal blasted in each blast if density of coal is 1410 kg/m^3.

Options :

1. ✓ 17.7 t

2. ✗ 177.6 m^3

3. ✗ 174.3 t

4. ✗ 19 kg

Question Number : 133 Question Id : 7225446134 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 statement is not associated with longwall advancing compared to longwall retreating method of mining coal seams

Options :

1. ✖ Stables are required

2. ✖ Requires pack walls

3. ✔ Ventilation is efficient

4. ✖ Maintenance of gate roadways is difficult

Question Number : 134 Question Id : 7225446135 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not a longwall face instrument?

Options :

1. ✖ Powered support

2. ✖ AFC

3. ✔ LHD

4. ✖ DERD

Question Number : 135 Question Id : 7225446136 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A coal seam of 10 m thickness existing at a depth of 130 m from the surface is being planned to be excavated with OB and coal benches of height 10 and 5.0 m respectively with a bench slope angle of 70 degrees. Then number of benches needed to excavate coal are

Options :

1. ✗ 13

2. ✗ 12

3. ✓ 15

4. ✗ 20

Question Number : 136 Question Id : 7225446137 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The incline approach in the form of spiral is known as

Options :

1. ✗ Shaft

2. ✗ Incline

3. ✗ Adit

4. ✓ Decline

Question Number : 137 Question Id : 7225446138 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The part of the pillar left against the footwall is

Options :

1. ✓ Sill pillar

2. ✗ Crown pillar

3. ✗ Level

4. ✗ Rib pillar

Question Number : 138 Question Id : 7225446139 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum length of spherical charge used in VCR stoping method if the explosive hole diameter is 250 mm

Options :

1. ✗ 800 mm

2. ✗ 1000 mm

3. ✔ 1500 mm

4. ✖ 2500 mm

Question Number : 139 Question Id : 7225446140 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The samples are collected from the exposed faces of orebody is

Options :

1. ✔ Channel sampling

2. ✖ Chip sampling

3. ✖ Grab sampling

4. ✖ Bulk sampling

Question Number : 140 Question Id : 7225446141 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A rock sample of 54 mm in diameter having L/D ratio is 0.5 broken at 200 kgs of load. Then tensile strength of a sample is

Options :

1. ✖ 428 kPa

2. ✖ 428 Pa

3. ✔ 857 kPa

4. ✖ 857 Pa

Question Number : 141 Question Id : 7225446142 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A roof breaker line of support in an underground coal mine is erected at

Options :

1. ✖ Bord & Pillar Development face

2. ✖ Junction of Bord & Pillar Depillaring district

3. ✖ Longwall face

4. ✔ Goaf edge

Question Number : 142 Question Id : 7225446143 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The support used in the longwall face is

Options :

1. ✖ Hydraulic prop

2. ✔ Powered support

3. ✖ Friction prop

4. ✖ Roof bolt

Question Number : 143 Question Id : 7225446144 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The longwall panel of 150 m x 1500 m size is being supported with 1.5 m wide support of 2 x 1000 t capacity. Then number of supports required to support the panel are

Options :

1. ✖ 1000

2. ✔ 100

3. ✖ 200

4. ✖ 250

Question Number : 144 Question Id : 7225446145 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The core recovered from 2 m core drilling is as follows 20 cm, 9 cm, 42 cm, 2 cm, 12 cm, 40 cm and 30 cm. Then RQD is

Options :

1. ✖ 82%

2. ✔ 72%

3. ✖ 77.5%

4. ✖ 82.5%

Question Number : 145 Question Id : 7225446146 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 not considered for estimation of RMR

Options :

1. ✔ Core recovery

2. ✖ RQD

3. ✖ Joints spacing

4. ✗ Water content

Question Number : 146 Question Id : 7225446147 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The incline shaft in which air flows downward direction; then the shaft is known as

Options :

1. ✓ DC

2. ✗ UC

3. ✗ Adit

4. ✗ Intake

Question Number : 147 Question Id : 7225446148 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 200 m depth shaft being used for ventilating air flow into the underground bord and pillar coal panel. Air density is 1.1 kg/m^3. Then NVP is

Options :

1. ✗ 981 Pa

2. ✗ 2158 kPa

3. ✓ 2158 Pa

4. ✗ 9810 Pa

Question Number : 148 Question Id : 7225446149 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An air quantity of 200 m^3/s flows through a mine having two splits A and B. The length of splits of A and B are 200 m and 150 m respectively. Then quantity flows in split A is

Options :

1. ✗ A>B

2. ✓ A<B

3. ✗ A=B

4. ✗ A=0

Question Number : 149 Question Id : 7225446150 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A mine is having two parallel splits and quantity flows in each split is 20 m^3/s. The pressure drop across the parallel splits is 2000 Pa. Then resistance of each gallery is

Options :

1. ✓ $5\ NS^2/m^8$

2. ✗ $5\ NS^2/m^4$

3. ✗ $100\ kg/m^3$

4. ✗ $9.81\ NS^2/m^8$

Question Number : 150 Question Id : 7225446151 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Air flows in split A is 20 m^3/s and that of b is 30 m^3/s; and pressure drop across the split is 1000 Pa. What will be the resistance of the regulator to reduce the quantity of split B to 15 m^3/s

Options :

1. ✗ $2.39\ NS^2/m^8$

2. ✗ $2.5\ NS^2/m^8$

3. ✓ $3.33NS^2/m^8$

4. ✗ $7.5\ NS^2/m^8$

Question Number : 151 Question Id : 7225446152 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

A. Pressure	1. Sq. root of (P/R)
B. Quantity	2. RQ^3
C. Power	3. RQ^2

Options :

1. ✗ A-1,B-2,C-3

2. ✗ A-2,B-1,C-3

3. ✗ A-1,B-3,C-2

4. ✓ A-3,B-1,C-2

Question Number : 152 Question Id : 7225446153 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

A. Relative humidity	1. Kata thermometer
B. Cooling power	2. Hygro meter
C. Quantity	3. Anemo meter

Options :

1. ✗ A-1,B-2,C-3

2. ✓ A-2,B-1,C-3

3. ✗ A-1,B-3,C-2

4. ✗ A-3,B-1,C-2

Question Number : 153 Question Id : 7225446154 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Flam safety lamp is used in underground mines to detect

Options :

1. ✗ CH_4

2. ✗ CH_4 & O_2

3. ✓ CH_4, O_2 & CO_2

4. ✗ CH_4, O_2 & CO

Question Number : 154 Question Id : 7225446155 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sample of air collected in the intake and return gates of a retreating longwall face show 0.3 and 0.8% CH_4 respectively. Calculate the methane emission per tonne of coal mined. If the production of the longwall face is 2,000 tonnes per day and an air quantity of 20 m^3 /s circulates along the face.

Options :

1. ✖ 2. 4 m^3/t

2. ✔ 4.32 m^3/t

3. ✖ 43.2 m^3/t

4. ✖ 4.32 t/m^3

Question Number : 155 Question Id : 7225446156 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mine air sample contains various gases such as $O_2 = 18\%$; $CO_2 = 2.5\%$; $N_2 = 78\%$ and $H_2S = 3.5\%$; then stink damp is

Options :

1. ✖ 81 %

2. ✔ 3.5 %

3. ✖ 21 %

4. ✗ 2.5 %

Question Number : 156 Question Id : 7225446157 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The percentage of gases by volume in return air is given as O_2=19.95%; CO_2=3%; N_2=76% and CO=1.05 %. Then the air indicates

Options :

1. ✗ Spontaneous heating

2. ✗ Heating in advanced stage

3. ✓ Active fire

4. ✗ No fire

Question Number : 157 Question Id : 7225446158 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mine air consists of O_2=16.5%; CO_2=3%; N_2=74% and CH_4=6.5 %. Then the air composition is

Options :

1. ✗ Not capable for explosion

2. ✗ Capable for explosion

3. ✓ Explosive

4. ✗ Mixture does not exist

Question Number : 158 Question Id : 7225446159 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hoolamite tube consists of

Options :

1. ✗ Manganese dioxide

2. ✗ Copper oxide

3. ✓ Sulphuric acid

4. ✗ Potassium sulphide

Question Number : 159 Question Id : 7225446160 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hook worm disease is

Options :

1. ✗ Siderosis

2. ✗ Asbestosis

3. ✓ Akylostomiasis

4. ✗ Nystagmus

Question Number : 160 Question Id : 7225446161 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gas mask converts CO to

Options :

1. ✗ H_2S

2. ✓ CO_2

3. ✗ H_2O

4. ✗ CH_4

Question Number : 161 Question Id : 7225446162 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A line of 770 m is measured to be 766.9 m with a chain of 30 m length. Then the true length of the chain is

Options :

1. ✗ 31 m

2. ✗ 32 m

3. ✓ 30.12 m

4. ✗ 31.12 m

Question Number : 162 Question Id : 7225446163 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bearings of lines AB and BC are 210° and 80° respectively. Then the included angle $\angle ABC$ is

Options :

1. ✗ 290°

2. ✗ 130°

3. ✗ 70°

4. ✓ 50°

Question Number : 163 Question Id : 7225446164 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnetic declination of a given point is 20°20′W. The magnetic azimuth of a line AB is 160°20′. What is the true bearing of the line?

Options :

1. ✗ 120°

2. ✓ S 40° E

3. ✗ 180° 40'

4. ✗ S 0° 40' W

Question Number : 164 Question Id : 7225446165 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The check in collimation method is

Options :

1. ✓ $\sum BS - \sum FS = Last\ RL - First\ RL$

2. ✗ $\sum FS - \sum BS = First\ RL - Last\ RL$

3. ✗ $\sum FS - \sum BS = \sum Fall - \sum Rise$

4. ✗ $\sum BS - \sum FS = \sum Rise - \sum Fall$

Question Number : 165 Question Id : 7225446166 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The levelling in which the relative levels of two and more isolated points are determined with no intermediate sights is

Options :

1. ✗ Check levelling

2. ✗ Precise levelling

3. ✗ Reciprocal levelling

4. ✓ Fly levelling

Question Number : 166 Question Id : 7225446167 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Contour lines cross ridge lines or valley lines approximately at an angle of

Options :

1. ✗ 0°

2. ✓ 90°

3. ✗ 60°

4. ✗ 45°

Question Number : 167 Question Id : 7225446168 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 30 m length line is making an angle of 60° with the true north. The departure of the line is approximately

Options :

1. ✓ 26 m

2. ✗ 15 m

3. ✗ 60 m

4. ✗ 35 m

Question Number : 168 Question Id : 7225446169 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The whole circle bearing of a line AB is $123^0 40'15"$; then reduced bearing of that line is

Options :

1. ✓ S $56^0$19'45"E

2. ✗ S $39^0$29'45"W

3. ✗ N $45^0$30'15" W

4. ✗ N 45^0 W

Question Number : 169 Question Id : 7225446170 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The survey used for transferring the surface features to underground is

Options :

1. ✗ Compass

2. ✓ Correlation

3. ✗ Levelling

4. ✗ Tacheometry

Question Number : 170 Question Id : 7225446171 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A vertical distance between any two consecutive contours is

Options :

1. ✗ Horizontal equivalent

2. ✓ Contour interval

3. ✗ Hill

4. ✗ Valley

Question Number : 171 Question Id : 7225446172 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The latitude and longitude of a pint B of a line AB are 50 m and 50 m; then length of a line is about

Options :

1. ✗ 82 m

2. ✗ 142 m

3. ✓ 71 m

4. ✗ 250 m

Question Number : 172 Question Id : 7225446173 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simple curve is drawn with deflection angle and radius of 60 deg. and 20 m respectively. Then tangent length of a curve is

Options :

1. ✗ 10.5 m

2. ✗ 12.5 m

3. ✓ 11.5 m

4. ✗ 17.5 m

Question Number : 173 Question Id : 7225446174 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a tachometry surveying, the staff intercept is observed as 10 m and stadia constants of tachometer are 100 and 0. Then horizontal distance is

Options :

1. ✗ 50 m

2. ✗ 100 m

3. ✔ 1000 m

4. ✖ 2500 m

Question Number : 174 Question Id : 7225446175 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A line on which all the points represent the same altitude is

Options :

1. ✖ Dip

2. ✔ Strike

3. ✖ True dip

4. ✖ Apparent dip

Question Number : 175 Question Id : 7225446176 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The instrument used for measuring distance is

Options :

1. ✖ Auto level

2. ✗ Compass

3. ✗ Theodolite

4. ✓ Tacheometer

Question Number : 176 Question Id : 7225446177 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Increase in space factor in steel wire ropes indicates

Options :

1. ✗ Increase in flexibility of rope

2. ✗ Increase in number of strands in rope

3. ✗ Increase in total number of wires

4. ✓ Increase in load bearing capacity

Question Number : 177 Question Id : 7225446178 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:

Rope construction		Number of strands
A.	6 x 7	1. 4
B.	7 x 6	2. 5
C.	4 x 5	3. 6
D.	5 x 4	4. 7

Options :

1. ✖ A-1; B-2;C-3; D-4

2. ✖ A-2; B-1;C-3; D-4

3. ✔ A-3; B-4;C-1; D-2

4. ✖ A-1; B-2;C-4; D-3

Question Number : 178 Question Id : 7225446179 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The device being used for bending the rail to suitable curvature is

Options :

1. ✖ Back stay

2. ✔ Jim crow

3. ✗ Stop block

4. ✗ Monkey catch

Question Number : 179 Question Id : 7225446180 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A device which locks the conveyor automatically and prevents the backward movement of belt in the event of power cut off is

Options :

1. ✗ Tension bogey

2. ✓ Hold back

3. ✗ Clifton pulley

4. ✗ Jim crow

Question Number : 180 Question Id : 7225446181 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A belt with cross sectional area of coal on it as 0.144 m^2 at a speed of 180 m/min. Carrying capacity of the belt is _____ when density of coal is 1500 kg/m^3

Options :

1. ✗ 4.32 kg/s

2. ✗ 6.48 t/hr

3. ✓ 648 kg/s

4. ✗ 432 t/h

Question Number : 181 Question Id : 7225446182 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum gradient on which a direct rope haulage with single track and tubs with pedestal bearings can be operated is

Options :

1. ✗ 1 in 100

2. ✗ 1 in 50

3. ✗ 1 in 25

4. ✓ 1 in 10

Question Number : 182 Question Id : 7225446183 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A centrifugal pump has a discharge rate of 0.5 m^3/s of water against a total head of 300 m. If the pump efficiency is 75%, the input power to the pump is

Options :

1. ✗ 2000 kW

2. ✓ 1962 kW

3. ✗ 4500 kW

4. ✗ 112.5 kW

Question Number : 183 Question Id : 7225446184 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Full form of AFC is

Options :

1. ✓ Armoured face conveyor

2. ✗ Armoured floor conveyor

3. ✗ Armoured face conductor

4. ✗ Armoured flexible conductor

Question Number : 184 Question Id : 7225446185 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:

A. SERD	1. Size reduction
B. Shield support	2. Cutting the coal face
C. BSL	3. Supporting the face
D. Lump breaker	4. Transportation of coal

Options :

1. ✗ A-1; B-2;C-3; D-4

2. ✗ A-2; B-1;C-3; D-4

3. ✓ A-2; B-3;C-4; D-1

4. ✗ A-1; B-2;C-4; D-3

Question Number : 185 Question Id : 7225446186 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Remote controlled LHD is used in which mining method

Options :

1. ✗ Bord and pillar

2. ✗ LW

3. ✗ CM

4. ✓ BG

Question Number : 186 Question Id : 7225446187 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Lowering and raining the cages in a shaft more than 30 depth is to be done with the help of

Options :

1. ✓ Electrical Signals

2. ✗ Sound by hand

3. ✗ Sound by mouth

4. ✗ Light signals

Question Number : 187 Question Id : 7225446188 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 vertical plane of the pulley and the rope when the cage is at pit top is

Options :

1. ✗ Drum angle

2. ✓ Fleet angle

3. ✗ Feet angle

4. ✗ Shaft angle

Question Number : 188 Question Id : 7225446189 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Keps are provided at

Options :

1. ✓ Pit top in drum winding

2. ✗ Pit bottom in drum winding

3. ✗ Pit top in Koepe winding

4. ✗ Pit bottom in Koepe winding

Question Number : 189 Question Id : 7225446190 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 power of motor if torque, diameter of drum and rope speed are 100 kNm, 4 m and 5 m/s respectively?

Options :

1. ✔ 250 kW

2. ✖ 100 kW

3. ✖ 200 kW

4. ✖ 500 kW

Question Number : 190 Question Id : 7225446191 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rope in Koepe winding may slip if T_1/T_2 is more than

Options :

1. ✔ 2.0

2. ✖ 1.75

3. ✖ 1.50

4. ✖ 1.25

Question Number : 191 Question Id : 7225446192 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A person appointed for lowering or raising the persons, tools and materials is known as

Options :

1. ✓ Banks man

2. ✗ Short firer

3. ✗ Sirdar

4. ✗ Overman

Question Number : 192 Question Id : 7225446193 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

No person shall be admitted as a candidate at any examination to be held during July 2022 by DGMS unless he was born during

Options :

1. ✓ March 2002

2. ✗ March 2003

3. ✗ March 2004

4. ✗ March 2005

Question Number : 193 Question Id : 7225446194 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A mine management is planning to submit the annual returns to the Chief Inspector on or before 1st Feb 2023. Then the return belongs to

Options :

1. ✗ 2020

2. ✗ 2021

3. ✓ 2022

4. ✗ 2023

Question Number : 194 Question Id : 7225446195 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What should be the minimum length of the scale suitably sub divided on the mine plan is

Options :

1. ✗ 20 cm

2. ✓ 25 cm

3. ✗ 30 cm

4. ✗ 35 cm

Question Number : 195 Question Id : 7225446196 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum distance between toe of active dump and active workings shall not be less than

Options :

1. ✗ 400 m

2. ✗ 300 m

3. ✗ 200 m

4. ✓ 100 m

Question Number : 196 Question Id : 7225446197 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 10 m thick coal seam situated at 270 m depth from surface is being planned to develop by 4.8 m gallery, then the minimum pillar size should be

Options :

1. ✗ 30 m

2. ✗ 35 m

3. ✗ 40 m

4. ✓ 45 m

Question Number : 197 Question Id : 7225446198 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A coal seam of 1.2 m thick is being depillared with bord and pillar method. The height of manhole made in the haulage roadway is

Options :

1. ✗ 2 m

2. ✗ 1.6 m

3. ✓ 1.2 m

4. ✗ 0.8 m

Question Number : 198 Question Id : 7225446199 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rescue room is provided in every underground mine where no rescue station is available within a radius of

Options :

1. ✗ 20 kms

2. ✖ 25 kms

3. ✖ 30 kms

4. ✔ 35 kms

Question Number : 199 Question Id : 7225446200 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A total of 1500 persons are employed in the underground mine. Then number of workmen inspector appointed are

Options :

1. ✖ 1

2. ✖ 2

3. ✔ 3

4. ✖ 4

Question Number : 200 Question Id : 7225446201 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Number of latrine seats are provided on any mine if 85 persons are employed in the mine

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4