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 19th Sep 2021 Shift2
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 :	477203421

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 : 47720321433 Display Question Number : Yes Is Question Mandatory : No

If $k \neq -5$ is a real number, then, the number of solutions to the following system of equations

$$3x - y + 4z = 3$$
$$x + 2y - 3z = -2$$
$$6x + 5y + kz = -3$$ is

Options :

1. ✖ *0*

2. ✔ *1*

3. ✖ *2*

4. ✖ *infinitely many*

Question Number : 2 Question Id : 47720321434 Display Question Number : Yes Is Question Mandatory : No

$$\begin{vmatrix} 1 & 1+p & 1+p+q \\ 2 & 3+2p & 4+3p+2q \\ 3 & 6+3p & 10+6p+3q \end{vmatrix} =$$

Options :

1. ✖ 0

2. ✔ 1

3. ✖ 2

4. ✖ 3

Question Number : 3 Question Id : 47720321435 Display Question Number : Yes Is Question Mandatory : No

Let $|A|$ denote the determinant of the matrix A. If A is a square matrix of order 3, and $|4A| = r|A|$, then the value of r is

Options :

1. ✖ 0

2. ✖ 4

3. ✖ 16

4. ✔ 64

Question Number : 4 Question Id : 47720321436 Display Question Number : Yes Is Question Mandatory : No

If $\begin{vmatrix} y & y \\ 1 & y \end{vmatrix} = \begin{vmatrix} 3 & 4 \\ 1 & 2 \end{vmatrix}$, then the value of y is

Options :

1. ✖ 0

2. ✖ 1

3. ✔ 2

4. ✖ 3

Question Number : 5 Question Id : 47720321437 Display Question Number : Yes Is Question Mandatory : No

Let $\begin{vmatrix} 2 & 3+i & -1 \\ 3-i & 0 & -1+i \\ -1 & -1-i & 1 \end{vmatrix} = a+ib$, where a and b are real numbers. Then the value of b is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 3

4. ✖ 4

Question Number : 6 Question Id : 47720321438 Display Question Number : Yes Is Question Mandatory : No

If $\frac{y^2-5y+1}{(y+1)(y+2)(y+3)} = \frac{a}{y+1} + \frac{b}{(y+1)(y+2)} + \frac{c}{(y+1)(y+2)(y+3)}$, then,

Options :

1. ✖ $a = 1, b = 10, c = 25$

2. ✔ $a = 1, b = -10, c = 25$

3. ✖ $a = 5, b = 10, c = 25$

4. ✖ $a = 5, b = -10, c = 25$

Question Number : 7 Question Id : 47720321439 Display Question Number : Yes Is Question Mandatory : No

$\frac{2x+3}{(x^2+1)(x+4)} =$

Options :

1. ✖ $\frac{5}{17(x+4)} + \frac{5x+14}{17(x^2+1)}$

2. ✖ $\frac{-5}{17(x+4)} - \frac{5x+14}{17(x^2+1)}$

3. ✔ $\frac{-5}{17(x+4)} + \frac{5x+14}{17(x^2+1)}$

4. ✖ $\frac{-5}{17(x+4)} + \frac{5x-14}{17(x^2+1)}$

Question Number : 8 Question Id : 47720321440 Display Question Number : Yes Is Question Mandatory : No

If x and y are two distinct real numbers, then, the number of values of θ in $[0,2\pi]$ for which $\text{cosec}\ \theta=\frac{x^2-y^2}{x^2+y^2}$ is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 2

4. ✖ 3

Question Number : 9 Question Id : 47720321441 Display Question Number : Yes Is Question Mandatory : No

If $\cos(\alpha-\beta)+\cos(\beta-\gamma)+\cos(\gamma-\alpha)=-\frac{3}{2}$, then $\cos\alpha+\cos\beta+\cos\gamma=$

Options :

1. ✖ $-\frac{3}{2}$

2. ✖ -1

3. ✔ 0

4. ✖ 1

Question Number : 10 Question Id : 47720321442 Display Question Number : Yes Is Question Mandatory : No

For all real numbers θ, the value of $\sin^2\theta + \cos^4\theta$ is greater than or equal to

Options :

1. ✔ $\frac{3}{4}$

2. ✖ 1

3. ✖ $\frac{5}{4}$

4. ✖ 2

Question Number : 11 Question Id : 47720321443 Display Question Number : Yes Is Question Mandatory : No

Let x be a real number such that $\tan\left(\frac{\pi}{4}+x\right)+\tan\left(\frac{\pi}{4}-x\right)=2$. Then x is of the form $x=n\pi+a$, where $n\in\mathbb{Z}$, and $a=$

Options :

1. ✔ 0

2. ✖ $\frac{\pi}{3}$

3. ✖ $\frac{\pi}{4}$

4. ✖ $\frac{\pi}{6}$

Question Number : 12 Question Id : 47720321444 Display Question Number : Yes Is Question Mandatory : No

If $(sin^{-1}x) > (cos^{-1}x)$, then x belongs to the interval

Options :

1. ✖ $[0,\frac{1}{\sqrt{2}})$

2. ✔ $(\frac{1}{\sqrt{2}},1]$

3. ✖ $\left[\frac{1}{\sqrt{2}},1\right]$

4. ✖ $\left[0,\frac{1}{\sqrt{2}}\right]$

Question Number : 13 Question Id : 47720321445 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle ΔABC, with sides of length a,b and c, and angles A,B and C. If a,b,c and the area of the triangle ΔABC are all rational, then

Options :

1. ✖ $tan\frac{B}{2}$ *is rational and* $tan\frac{C}{2}$ *is irrational.*

2. ✖ $tan\frac{B}{2}$ *is irrational and* $tan\frac{C}{2}$ *is rational.*

3. ✔ $tan\frac{B}{2}$ *and* $tan\frac{C}{2}$ *are both rational.*

4. ✖ $tan\frac{B}{2}$ *and* $tan\frac{C}{2}$ *are both irrational.*

Question Number : 14 Question Id : 47720321446 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle ΔABC, with sides of length a,b and c, and angles A,B and C. If $3a=b+c$, then the value of $cot\frac{B}{2}.cot\frac{C}{2}$ is

Options :

1. ✖ 0

2. ✖ $\frac{1}{2}$

3. ✖ $\sqrt{3}$

4. ✔ 2

Question Number : 15 Question Id : 47720321447 Display Question Number : Yes Is Question Mandatory : No

$2\,tan^{-1}\left(\frac{3}{4}\right) - tan^{-1}\left(\frac{17}{31}\right) =$

Options :

1. ✖ 0

2. ✔ $\frac{\pi}{4}$

3. ✖ $\frac{\pi}{2}$

4. ✖ π

Question Number : 16 Question Id : 47720321448 Display Question Number : Yes Is Question Mandatory : No

Consider a triangle ΔABC with angles A,B and C. If $\cos A + \cos B + \cos C = \frac{3}{2}$, then the triangle ΔABC is

Options :

1. ✔ equilateral.

2. ✖ isosceles, and right-angled.

3. ✖ isosceles, with one of the angles equal to $\frac{\pi}{6}$.

4. ✖ scalene

Question Number : 17 Question Id : 47720321449 Display Question Number : Yes Is Question Mandatory : No

The value of $\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right)$ is

Options :

1. ✖ 1

2. ✔ $\frac{3}{2}$

3. ✖ 2

4. ✖ $\frac{5}{2}$

Question Number : 18 Question Id : 47720321450 Display Question Number : Yes Is Question Mandatory : No

The value of $\left(\frac{\sqrt{3}+i}{\sqrt{3}-i}\right)^3$ is

Options :

1. ✖ $-2\sqrt{2}$

2. ✔ -1

3. ✖ 0

4. ✖ $2\sqrt{2}$

Question Number : 19 Question Id : 47720321451 Display Question Number : Yes Is Question Mandatory : No

If $x+iy=\frac{a+ib}{a-ib}$, then $x^2+y^2=$

Options :

1. ✖ 0

2. ✔ 1

3. ✖ 2

4. ✖ 4

Question Number : 20 Question Id : 47720321452 Display Question Number : Yes Is Question Mandatory : No

If a circle of radius 5 touches the circle $x^2 + y^2 - 2x - 4y = 20$ at the point *(5,5), then, its center is*

Options :

1. ✖ (8,8)

2. ✖ (8,9)

3. ✔ (9,8)

4. ✖ (9,9)

Question Number : 21 Question Id : 47720321453 Display Question Number : Yes Is Question Mandatory : No

The equation $9x^2 - 24xy + 16\,y^2 - 20x - 15y = 60$ represents

Options :

1. ✔ a parabola

2. ✖ an ellipse

3. ✖ a hyperbola

4. ✖ a circle

Question Number : 22 Question Id : 47720321454 Display Question Number : Yes Is Question Mandatory : No

Let (x_j,y_j), $j=1,2,3,4$, be points of intersection of the parabola $y^2 = 4ax$ and the circle $x^2 + y^2 + 2gx + 2fy + c = 0$.

Then $y_1 + y_2 + y_3 + y_4 =$

Options :

1. ✖ -2

2. ✖ $-\frac{1}{2}$

3. ✔ 0

4. ✖ $\frac{1}{2}$

Question Number : 23 Question Id : 47720321455 Display Question Number : Yes Is Question Mandatory : No

The length of the major axis of the ellipse $9x^2 + 5y^2 - 30y = 0$ is

Options :

1. ✖ $\sqrt{5}$

2. ✖ 3

3. ✖ $2\sqrt{5}$

4. ✔ 6

Question Number : 24 Question Id : 47720321456 Display Question Number : Yes Is Question Mandatory : No

If S *(-1, 1) is one of the foci of a hyperbola,* $x - y + 3 = 0$ is its directrix corresponding to S and 3 is its eccentricity, then, the equation of the hyperbola is

Options :

1. ✖ $7x^2 + 18xy + 7y^2 + 50x + 50y + 77 = 0$

2. ✖ $7x^2 + 18xy + 7y^2 + 50x - 50y + 77 = 0$

3. ✔ $7x^2 - 18xy + 7y^2 + 50x - 50y + 77 = 0$

4. ✖ $7x^2 - 18xy - 7y^2 - 50x + 50y + 77 = 0$

Question Number : 25 Question Id : 47720321457 Display Question Number : Yes Is Question Mandatory : No

The equation $4(x - 2y + 1)^2 + 9(2x + y + 2)^2 = 25$ represents

Options :

1. ✖ a parabola

2. ✔ an ellipse

3. ✖ a hyperbola

4. ✖ a circle

Question Number : 26 Question Id : 47720321458 Display Question Number : Yes Is Question Mandatory : No

Let f be a twice differentiable function such that $f''(x) + f(x) = 0$, and $f'(x) = g(x)$. If $h(x) = [f(x)]^2 + [g(x)]^2$, and $h(10) = 20$, then $h(40)$ =

Options :

1. ✔ 20

2. ✖ 40

3. ✖ 80

4. ✖ 160

Question Number : 27 Question Id : 47720321459 Display Question Number : Yes Is Question Mandatory : No

$$\lim_{x \to \frac{\pi}{2}} \left(\frac{\cot x - \cos x}{\cos^2 x}\right) =$$

Options :

1. ✖ -1

2. ✔ 0

3. ✖ $\sqrt{3}$

4. ✖ $\frac{\pi}{2}$

Question Number : 28 Question Id : 47720321460 Display Question Number : Yes Is Question Mandatory : No

Let $\mathbb{R}$ be the set of all real numbers. Let $f : \mathbb{R} \to \mathbb{R}$ satisfy the condition:

$|f(x) - f(y)| \leq |x-y|^{2021}$, for all $x,y \in \mathbb{R}$. Then the value of $f'(2022)$ is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ 2021

4. ✖ 2022

Question Number : 29 Question Id : 47720321461 Display Question Number : Yes Is Question Mandatory : No

The number of real roots of the equation $x + e^x = 0$ is

Options :

1. ✖ 0

2. ✔ 1

3. ✖ 2

4. ✖ Infinitely many

Question Number : 30 Question Id : 47720321462 Display Question Number : Yes Is Question Mandatory : No

If $y = \text{Tan}^{-1}\left(\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right)$, then $\frac{dy}{dx} =$

Options :

1. ✖ $\cot^2 x$

2. ✖ $\sec^2 x$

3. ✔ $-\frac{1}{2}$

4. ✖ $\frac{1}{2}$

Question Number : 31 Question Id : 47720321463 Display Question Number : Yes Is Question Mandatory : No

The equation of the tangent to the curve $x = \sin 3t$, $y = \cos 2t$, at $t = \frac{\pi}{4}$ is given by

Options :

1. ✖ $\sqrt{2}\,x - 3y - 2 = 0$

2. ✖ $\sqrt{2}\,x + 3y - 2 = 0$

3. ✔ $2\sqrt{2}\,x - 3y - 2 = 0$

4. ✖ $2\sqrt{2}\,x - 3y + 2 = 0$

Question Number : 32 Question Id : 47720321464 Display Question Number : Yes Is Question Mandatory : No

An open tank with a square base (with side x) and vertical sides (with height y) is to be constructed from a metal sheet so as to hold a given quantity of water. The cost of the material will be the least if

Options :

1. ✖ $x=y$

2. ✔ $x=2y$

3. ✖ $2x=y$

4. ✖ $4x=y$

Question Number : 33 Question Id : 47720321465 Display Question Number : Yes Is Question Mandatory : No

The function $f(x) = x^3 - 12x^2 + 36x + 48$, is decreasing in the interval

Options :

1. ✖ $(-\infty, 2)$

2. ✖ $(-\infty, 6)$

3. ✔ $(2,6)$

4. ✖ $(6, \infty)$

Question Number : 34 Question Id : 47720321466 Display Question Number : Yes Is Question Mandatory : No

A shopkeeper can buy x items for *Rs.* $\left(\frac{x}{5} + 500\right)$. He can sell the x items at the rate *Rs.* $\left(5 - \frac{x}{100}\right)$ per item. Then the number of items he should sell to make maximum profit is

Options :

1. ✔ 240

2. ✖ 360

3. ✖ 400

4. ✖ 500

Question Number : 35 Question Id : 47720321467 Display Question Number : Yes Is Question Mandatory : No

If $z = ax^2 + 2hxy + by^2$, then $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} =$

Options :

1. ✖ z

2. ✖ z^2

3. ✖ $\frac{1}{2}z$

4. ✔ $2z$

Question Number : 36 Question Id : 47720321468 Display Question Number : Yes Is Question Mandatory : No

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

Options :

1. ✖ 0

2. ✖ 1

3. ✖ $\frac{3}{2}$

4. ✔ 2

Question Number : 37 Question Id : 47720321469 Display Question Number : Yes Is Question Mandatory : No

The area of the region bounded by the curve $y = x^2 + 4$, the x-axis and the ordinates at $x=1$ and $x=5$ is

Options :

1. ✖ $\frac{147}{3}$

2. ✔ $\frac{172}{3}$

3. ✖ $\frac{187}{3}$

4. ✖ $\frac{227}{3}$

Question Number : 38 Question Id : 47720321470 Display Question Number : Yes Is Question Mandatory : No

$\lim_{n\to\infty} \sum_{k=0}^{n-1} \frac{1}{\sqrt{n^2-k^2}} =$

Options :

1. ✖ 0

2. ✔ $\frac{\pi}{2}$

3. ✖ π

4. ✖ 2π

Question Number : 39 Question Id : 47720321471 Display Question Number : Yes Is Question

Mandatory : No

$\int_0^1 \frac{2x}{1+x^2}\, dx =$

Options :

1. ✖ 1

2. ✖ 2

3. ✔ $log\ 2$

4. ✖ $3\ log\ 2$

Question Number : 40 Question Id : 47720321472 Display Question Number : Yes Is Question Mandatory : No

$$\int \frac{e^{ax} - e^{-ax}}{e^{ax} + e^{-ax}}\, dx =$$

(In the following, c is a constant.)

Options :

1. ✔ $\frac{1}{a} \log |e^{ax} + e^{-ax}| + c$

2. ✖ $\frac{1}{a} \log |e^{ax} - e^{-ax}| + c$

3. ✖ $\frac{1}{2a} \log |e^{ax} + e^{-ax}| + c$

4. ✖

$\frac{1}{2a}\log|e^{ax} - e^{-ax}| + c$

Question Number : 41 Question Id : 47720321473 Display Question Number : Yes Is Question Mandatory : No

$\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}}\, dx =$

Options :

1. ✖ $-\pi$

2. ✖ 0

3. ✔ $\frac{\pi}{2}$

4. ✖ π

Question Number : 42 Question Id : 47720321474 Display Question Number : Yes Is Question Mandatory : No

$\int_{-\pi}^{\pi} \sin^5 x\, dx =$

Options :

1. ✔ 0

2. ✖ $\frac{\pi}{2}$

3. ✖ π

4. ✖ 2π

Question Number : 43 Question Id : 47720321475 Display Question Number : Yes Is Question Mandatory : No

The area of the region bounded by $y=|x+3|$, the x-axis and the lines $x = -6$ and $x = 0$ is

Options :

1. ✖ *3 square units*

2. ✔ *9 square units*

3. ✖ *12 square units*

4. ✖ *18 square units*

Question Number : 44 Question Id : 47720321476 Display Question Number : Yes Is Question Mandatory : No

The degree of the differential equation $7x\left(\frac{dy}{dx}\right)^2 - \frac{d^2y}{dx^2} + 10y = \log x$ is

Options :

1. ✔ 1

2. ✖ 2

3. ✖

3

4. ✖ 4

Question Number : 45 Question Id : 47720321477 Display Question Number : Yes Is Question Mandatory : No

The solution of the differential equation $\frac{dy}{dx} = y \tan x$, given that $y=1$ when $x=0$, is given by

Options :

1. ✖ $y = \cos x$

2. ✖ $y = \cos 2x$

3. ✔ $y = \sec x$

4. ✖ $y = \sec 2x$

Question Number : 46 Question Id : 47720321478 Display Question Number : Yes Is Question Mandatory : No

The solution to the differential equation $(3x^2 + y)\frac{dx}{dy} = x, \ (x > 0)$, such that $y=1$ if $x=1$ is

Options :

1. ✖ $y = 2x^2 - x$

2. ✔ $y = 3x^2 - 2x$

3. ✖ $y = 4x^2 - 3x$

4. ✖ $y = 5x^2 - 4x$

Question Number : 47 Question Id : 47720321479 Display Question Number : Yes Is Question Mandatory : No

The differential equation of the family of parabolas having vertex at the origin and axis along the positive y-axis is

Options :

1. ✖ $xy' = 2$

2. ✔ $xy' = 2y$

3. ✖ $xy' = -2y$

4. ✖ $xy' = 2y^2$

Question Number : 48 Question Id : 47720321480 Display Question Number : Yes Is Question Mandatory : No

The solution of the differential equation $\frac{dy}{dx} + y \cot x = 4x \operatorname{cosec} x,\ (x \neq 0)$, given that $y=0$ when $x = \frac{\pi}{2}$ is

Options :

1. ✖ $y \operatorname{cosec} x = x^2 - \frac{\pi^2}{4}$

2. ✖

$y \operatorname{cosec} x = 2x^2 - \frac{\pi^2}{2}$

3. ✖ $y \sin x = x^2 - \frac{\pi^2}{4}$

$y \sin x = 2x^2 - \frac{\pi^2}{2}$

4. ✔

Question Number : 49 Question Id : 47720321481 Display Question Number : Yes Is Question Mandatory : No

The general solution of the differential equation $log_e\left(\frac{dy}{dx}\right) = ax + by$ is given by

Options :

$ae^{ax} + be^{-by} + C = 0$

1. ✖

$ae^{ax} - be^{-by} + C = 0$

2. ✖

$\frac{1}{a}e^{ax} + \frac{1}{b}e^{-by} + C = 0$

3. ✔

$\frac{1}{a}e^{ax} - \frac{1}{b}e^{-by} + C = 0$

4. ✖

Question Number : 50 Question Id : 47720321482 Display Question Number : Yes Is Question Mandatory : No

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

Options :

1. ✖ $-\frac{1}{10}(cos\ x + \sin x)$

2. ✔ $-\frac{1}{10}(cos\ x + 3\sin x)$

3. ✖ $-\frac{1}{10}(cos\ 3x + \sin 3x)$

4. ✖ $-\frac{1}{10}(3\ cos\ x + \sin x)$

Physics

Section Id :	477203422
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 : 47720321483 Display Question Number : Yes Is Question Mandatory : No

The dimensional formula for gravitational constant, G is

Options :

1. ✖ $M^1L^3T^{-2}$

2. ✔ $M^{-1}L^{3}T^{-2}$

3. ✖ $M^{0}L^{3}T^{-2}$

4. ✖ $M^{2}L^{3}T^{-2}$

Question Number : 52 Question Id : 47720321484 Display Question Number : Yes Is Question Mandatory : No

Which of the following quantities have not been expressed in proper units?

Options :

1. ✖ electric field = Newton/Coulomb

2. ✖ surface tension = Newton/meter

3. ✔ energy = kg m/s

4. ✖ pressure = Newton/m^2

Question Number : 53 Question Id : 47720321485 Display Question Number : Yes Is Question Mandatory : No

A vector A is along positive x-axis. If B is another vector such that AxB is zero, then B could be

Options :

1. ✖ $4\hat{j}$

2. ✔ $-4\hat{i}$

3. ✖ $-(\hat{i}+\hat{j})$

4. ✖ $(\hat{j}+\hat{k})$

Question Number : 54 Question Id : 47720321486 Display Question Number : Yes Is Question Mandatory : No

The scalar product of two vectors is $2\sqrt{3}$ and the magnitude of their vector product is 2.
The angle between them is

Options :

1. ✔ 30^0

2. ✖ 45^0

3. ✖ 60^0

4. ✖ 90^0

Question Number : 55 Question Id : 47720321487 Display Question Number : Yes Is Question Mandatory : No

The work done by a force is defined as W=**F**.**S**. In a certain situation **F** and **S** are not zero but the work done is zero when

Options :

1. ✖ **F** and **S** are in the same direction

2. ✖

$\mathbf{F}$ and $\mathbf{S}$ are in opposite direction

3. ✔ $\mathbf{F}$ and $\mathbf{S}$ are at right angles

4. ✖ $\mathbf{F}$ and $\mathbf{S}$ are at 45^0

Question Number : 56 Question Id : 47720321488 Display Question Number : Yes Is Question Mandatory : No

A body starts from rest and travels a distance x in first two seconds and a distance y in next two seconds. The relation between x and y is

Options :

1. ✖ $y = 4x$

2. ✖ $y = x$

3. ✔ $y = 3x$

4. ✖ $y = 2x$

Question Number : 57 Question Id : 47720321489 Display Question Number : Yes Is Question Mandatory : No

A projectile is projected with initial velocity $(6\hat{i} + 8\hat{j})$ m/s. If g = 10 m/s^2 then horizontal range is

Options :

1. ✖ 4.8 m

2. ✔

9.6 m

3. ✖ 19.2 m

4. ✖ 14.0 m

Question Number : 58 Question Id : 47720321490 Display Question Number : Yes Is Question Mandatory : No

The maximum range of a projectile fired with some initial velocity is found to be 1000 m/s, in the absence of wind and air resistance. The maximum height reached by this projectile is

Options :

1. ✔ 250 m

2. ✖ 500 m

3. ✖ 1000 m

4. ✖ 2000 m

Question Number : 59 Question Id : 47720321491 Display Question Number : Yes Is Question Mandatory : No

The force of friction between two bodies is

Options :

1. ✔ parallel to the contact surface

2. ✖ perpendicular to the contact surface

3. ✖ inclined at 30^0 to the contact surface

4. ✖ inclined at 60^0 to the contact surface

Question Number : 60 Question Id : 47720321492 Display Question Number : Yes Is Question Mandatory : No

A body is sliding down an inclined plane under its own weight at constant speed. If the inclination of the plane to the horizontal is 30^0, the angle of friction is

Options :

1. ✔ 30^0

2. ✖ 60^0

3. ✖ 45^0

4. ✖ 90^0

Question Number : 61 Question Id : 47720321493 Display Question Number : Yes Is Question Mandatory : No

A block of mass 5 kg is resting on a smooth surface. At what angle, a force of 20 N be acted on the body so that it will acquire a kinetic energy of 40 J after moving 4m

Options :

1. ✖ 30^0

2. ✖ 45^0

3. ✔ 60^0

4. ✖ 120^0

Question Number : 62 Question Id : 47720321494 Display Question Number : Yes Is Question Mandatory : No

Two men with the weights in the ratio 4:3 run up a staircase in time, in the ratio 12:11. The ratio of power of the first to that of second is

Options :

1. ✖ $\frac{4}{3}$

2. ✖ $\frac{12}{11}$

3. ✖ $\frac{48}{33}$

4. ✔ $\frac{11}{9}$

Question Number : 63 Question Id : 47720321495 Display Question Number : Yes Is Question Mandatory : No

Energy harnessed from flowing water is called----------energy

Options :

1. ✖ Solar

2. ✔ Hydel

3. ✖ Tidal

4. ✖ Geothermal

Question Number : 64 Question Id : 47720321496 Display Question Number : Yes Is Question Mandatory : No

The total mechanical energy of a spring-mass system in simple harmonic motion is $E = 0.5\ m\omega^2A^2$. If the oscillating particle is replaced by another particle of double the mass while the amplitude A remains the same. The new mechanical energy is

Options :

1. ✖ 2E

2. ✖ 0.5 E

3. ✖ $\sqrt{2}$ E

4. ✔ E

Question Number : 65 Question Id : 47720321497 Display Question Number : Yes Is Question Mandatory : No

Sound of frequency 1000 Hz from a stationary source is reflected from an object approaching the source at 30 m/s back to a stationary observer located at the source. The speed of sound in air is 330 m/s. The frequency of the sound heard by the observer is

Options :

1. ✔ 1200 Hz

2. ✖ 1000 Hz

3. ✖ 1090 Hz

4. ✖ 1100 Hz

Question Number : 66 Question Id : 47720321498 Display Question Number : Yes Is Question Mandatory : No

The frequency of a pendulum if it is taken from the earth's surface to deep into a mine

Options :

1. ✖ increases

2. ✔ decreases

3. ✖ first increases then decreases

4. ✖ remains unchanged

Question Number : 67 Question Id : 47720321499 Display Question Number : Yes Is Question Mandatory : No

Two waves of lengths 50 cm and 51 cm produced 12 beats per second. The velocity of sound is

Options :

1. ✖ 340 m/s

2. ✖ 2. 331 m/s

3. ✔ 306 m/s

4. ✖ 360 m/s

Question Number : 68 Question Id : 47720321500 Display Question Number : Yes Is Question Mandatory : No

According to reverberation time the final intensity 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 : 47720321501 Display Question Number : Yes Is Question

Mandatory : No

An ideal gas has volume V at pressure P and temperature T. Mass of each molecule is m. The density of the gas is

Options :

1. ✖ mKT

2. ✖ $\frac{P}{KT}$

3. ✖ $\frac{P}{KTV}$

4. ✔ $\frac{Pm}{KT}$

Question Number : 70 Question Id : 47720321502 Display Question Number : Yes Is Question Mandatory : No

Work done by 0.1 mole of a gas at 27^0C to double its volume at constant pressure is (R=2 cal/mol/K)

Options :

1. ✖ 54 cal

2. ✖ 600 cal

3. ✔ 60 cal

4. ✖ 546 cal

Question Number : 71 Question Id : 47720321503 Display Question Number : Yes Is Question Mandatory : No

If the pressure of a gas contained in a closed vessel is increased by 0.4%, when heated by 1^0C, its initial temperature is

Options :

1. ✔ 250 K

2. ✖ 150 K

3. ✖ 100 K

4. ✖ 50 K

Question Number : 72 Question Id : 47720321504 Display Question Number : Yes Is Question Mandatory : No

A monoatomic ideal gas, initially at temperature T_1 is enclosed in a cylinder fitted with a frictionless piston. The gas is allowed to expand adiabatically to a temperature T_2 by releasing the piston suddenly. If L_1 and L_2 are the lengths of the gas column, before and after expansion respectively, T_1/T_2 is given by

Options :

1. ✖ $\left(\frac{L_1}{L_2}\right)^{2/3}$

2. ✔ $\left(\frac{L_2}{L_1}\right)^{2/3}$

3. ✖ $\frac{L_1}{L_2}$

4. ✖ $\frac{L_2}{L_1}$

Question Number : 73 Question Id : 47720321505 Display Question Number : Yes Is Question Mandatory : No

A Carnot's engine operates with source at 127^0C and sink at 27^0 C. If the source supplies 40 kJ of heat energy, the work done by the engine is

Options :

1. ✖ 30 kJ

2. ✔ 10 kJ

3. ✖ 4 kJ

4. ✖ 1 kJ

Question Number : 74 Question Id : 47720321506 Display Question Number : Yes Is Question Mandatory : No

The optical fibre consisting of a central core is cladded by material of

Options :

1. ✔ slightly lower refractive index

2. ✖ slightly higher refractive index

3. ✖

equal refractive index

4. very high refractive index ✖

Question Number : 75 Question Id : 47720321507 Display Question Number : Yes Is Question Mandatory : No

The susceptibility of the superconductor is

Options :

1. positive and small ✖

2. negative and small ✖

3. positive and unity ✖

4. negative and unity ✔

Chemistry

Section Id :	477203423
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 : 47720321508 Display Question Number : Yes Is Question Mandatory : No

The nucleus of tritium consists of ---------

Options :

1. ✖ 1 proton + 1 neutron

2. ✖ 1 proton + 3 neutrons

3. ✖ 1 proton + zero neutron

4. ✔ 1 proton + 2 neutrons

Question Number : 77 Question Id : 47720321509 Display Question Number : Yes Is Question Mandatory : No

Which of the following electronic configuration is not possible?

Options :

1. ✖ $1s^2\,2s^2\,2p^6$

2. ✔ $1s^2\,2s^2\,2p^7$

3. ✖ $1s^2\,2s^2$

4. ✖ $1s^2\,2s^2\,2p^5$

Question Number : 78 Question Id : 47720321510 Display Question Number : Yes Is Question Mandatory : No

Radius of 3rd Bohr orbit of hydrogen atom is ------

Options :

1. ✖ $6.529A^0$

2. ✔ $4.761A^0$

3. ✖ $2.116A^0$

4. ✖ $8.464A^0$

Question Number : 79 Question Id : 47720321511 Display Question Number : Yes Is Question Mandatory : No

Covalent compounds are generally soluble in --------

Options :

1. ✔ Non-polar solvents

2. ✖ Polar solvents

3. ✖ Concentrated acids

4. ✖ All solvents

Question Number : 80 Question Id : 47720321512 Display Question Number : Yes Is Question Mandatory : No

Six electrons are mutually shared in ---------

Options :

1. ✖ F_2

2. ✖ Cl_2

3. ✖ O_2

4. ✔ N_2

Question Number : 81 Question Id : 47720321513 Display Question Number : Yes Is Question Mandatory : No

To half the molarity of a solution, the following should be adopted.

Options :

1. ✖ Weight of the solute to be doubled

2. ✖ Weight of the solvent to be doubled

3. ✖ Volume of the solvent to be doubled

4. ✔ Volume of the solution to be doubled

Question Number : 82 Question Id : 47720321514 Display Question Number : Yes Is Question Mandatory : No

The molecular weight of $KMnO_4$ is "M". In a reaction $KMnO_4$ is reduced to K_2MnO_4. The equivalent weight of $KMnO_4$ is

Options :

1. ✔ M

2. ✖ M/2

3. ✖ M/3

4. ✖ M/4

Question Number : 83 Question Id : 47720321515 Display Question Number : Yes Is Question Mandatory : No

Calculate the weight of NaOH present in 500 ml of 0.5 N Solution

Options :

1. ✖ 5 g

2. ✔ 10 g

3. ✖ 12 g

4. ✖ 15 g

Question Number : 84 Question Id : 47720321516 Display Question Number : Yes Is Question Mandatory : No

On addition of NaOH to water

Options :

1. ✖ Ionic product will increase

2. ✖ Ionic product will decrease

3. ✔ No change in ionic product of water

4. ✖ H_3O^+ concentration increases

Question Number : 85 Question Id : 47720321517 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a buffer solution?

Options :

1. ✖ (CH_3COOH/CH_3COONa)

2. ✔ (HCl/NaCl)

3. ✖ (HCOOH/HCOONa)

4. ✖ (NH_4OH/NH_4Cl)

Question Number : 86 Question Id : 47720321518 Display Question Number : Yes Is Question Mandatory : No

Which of the following is a good conductor of electricity?

Options :

1. ✖ Diamond

2. ✔ Graphite

3. ✖ Solid NaCl

4. ✖ Wood

Question Number : 87 Question Id : 47720321519 Display Question Number : Yes Is Question Mandatory : No

Which of the following (1M) conducts more electricity?

Options :

1. ✖ Acetic acid

2. ✖ Boric acid

3. ✖ Phosphorous acid

4. ✔ Sulphuric acid

Question Number : 88 Question Id : 47720321520 Display Question Number : Yes Is Question Mandatory : No

In electrolysis of dilute H_2SO_4, which of the following is liberated at anode in presence of inert electrode?

Options :

1. ✖ H_2

2. ✖ SO_2

3. ✔ O_2

4. ✖ SO_3

Question Number : 89 Question Id : 47720321521 Display Question Number : Yes Is Question Mandatory : No

The EMF of the cell Ni/Ni^{2+} (0.01M)/ Cl^-(0.01M)/Cl_2, Pt is ---V if the SRP of nickel and chlorine electrodes are -0.25V and +1.36V respectively

Options :

1. ✖ + 1.61

2. ✖ - 1.61

3. ✔ + 1.79

4. ✖ - 1.79

Question Number : 90 Question Id : 47720321522 Display Question Number : Yes Is Question Mandatory : No

Which of the following is correct relation used to measures the hardness of water?

Options :

1. ✔ 1 mg/L =1 ppm = 0.07^0Cl = 0.1^0Fr

2. ✖ $1\ mg/L = 0.1\ ppm = 0.7^0Cl = 0.1^0Fr$

3. ✖ $1\ mg/L = 1\ ppm = 0.7^0Cl = 0.01^0Fr$

4. ✖ $1\ mg/L = 1\ ppm = 0.7^0Cl = 1^0Fr$

Question Number : 91 Question Id : 47720321523 Display Question Number : Yes Is Question Mandatory : No

Which of the following is used as effective coagulant in the municipal water treatment to remove fine suspended and colloidal impurities?

Options :

1. ✖ $Fe_2SO_4(NH_4)_2SO_4.7H_20$

2. ✔ $K_2SO_4 . Al_2(SO_4)_3 . 24H_2O$

3. ✖ $CuSO_4.5H_2O$

4. ✖ $Na_2SO_4.6H_2O$

Question Number : 92 Question Id : 47720321524 Display Question Number : Yes Is Question Mandatory : No

The general chemical formula of zeolite is

Options :

1. ✔ $Na_2O .Al_2O_3 .x\ SiO_2 .y\ H_2O$

2. ✖ $Al_2O_3.H_2O$

3. ✖ $CaSO_4.2H_2O$

4. ✖ $MgSO_4.5H_2O$

Question Number : 93 Question Id : 47720321525 Display Question Number : Yes Is Question Mandatory : No

----- is resulted when electrochemical corrosion happened in acidic environment.

Options :

1. ✖ Evolution of oxygen

2. ✖ Absorption of oxygen

3. ✔ Evolution of hydrogen

4. ✖ Absorption of hydrogen

Question Number : 94 Question Id : 47720321526 Display Question Number : Yes Is Question Mandatory : No

Impure metal corrodes faster than pure metal due to

Options :

1. ✔ Heterogeneity

2. ✖ Homogeneity

3. ✖ Non-galvanic cell

4. ✖ localize corrosion

Question Number : 95 Question Id : 47720321527 Display Question Number : Yes Is Question Mandatory : No

The number of repeating units in a polymer is called

Options :

1. ✖ Functionality

2. ✖ Tacticity

3. ✔ degree of polymerization

4. ✖ Specificity

Question Number : 96 Question Id : 47720321528 Display Question Number : Yes Is Question Mandatory : No

The process of vulcanisation makes rubber --------

Options :

1. ✖ Soft

2. ✔ Hard

3. ✖ Elastic

4. ✖ Swells oils

Question Number : 97 Question Id : 47720321529 Display Question Number : Yes Is Question Mandatory : No

Which of the following is thermosetting plastic

Options :

1. ✖ PVC

2. ✖ Polystyrene

3. ✖ Teflon

4. ✔ Bakelite

Question Number : 98 Question Id : 47720321530 Display Question Number : Yes Is Question Mandatory : No

The boiling range of petrol fraction is found to be

Options :

1. ✖ 120^0C-180^0C

2. ✖ 250^0C-320^0C

3. ✔ 40^0C-120^0C

4. ✖ 180^0C-250^0C

Question Number : 99 Question Id : 47720321531 Display Question Number : Yes Is Question Mandatory : No

Which of the following is not a common component of photochemical smog?

Options :

1. ✖ Ozone

2. ✖ Acrolein

3. ✖ Peroxyacetyl nitrate

4. ✔ Chlorofluorocarbons

Question Number : 100 Question Id : 47720321532 Display Question Number : Yes Is Question Mandatory : No

White lung cancer is caused by

Options :

1. ✖ Asbestos

2. ✔ Textiles

3. ✖ Paper

4. ✖ Silica

Mining Engineering

Section Id :	477203424
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 : 47720321533 Display Question Number : Yes Is Question Mandatory : No

Which of the following is the correct order with respect to the core sizes?

Options :

1. ✔ NX>BX>AX>EX

2. ✖ AX>BX>EX>NX

3. ✖ AX>BX>NX>EX

4. ✖ EX>AX>BX>NX

Question Number : 102 Question Id : 47720321534 Display Question Number : Yes Is Question Mandatory : No

The energy transfer is smooth and more efficient in which of the following feed mechanism?

Options :

1. ✖ Air legs

2. ✖ Screw feed

3. ✔ Hydraulic feed

4. ✖ Chain feed

Question Number : 103 Question Id : 47720321535 Display Question Number : Yes Is Question Mandatory : No

To deal with misfire, how many metres away a relieving hole shall be drilled in an underground working face?

Options :

1. ✖ 0.2

2. ✔ 0.3

3. ✖ 0.5

4. ✖ 0.8

Question Number : 104 Question Id : 47720321536 Display Question Number : Yes Is Question Mandatory : No

Ignition temperature methane is:

Options :

1. ✖ 100-1250°C

2. ✖ 423-1000°C

3. ✖ 675-975°C

4. ✔ 923-1023°C

Question Number : 105 Question Id : 47720321537 Display Question Number : Yes Is Question Mandatory : No

In which of the following district, coal seams are occurring in Telangana state?

Options :

1. ✖ Hyderabad

2. ✖ Ranga Reddy

3. ✖ Mahbubnagar

4. ✔ Karimnagar

Question Number : 106 Question Id : 47720321538 Display Question Number : Yes Is Question Mandatory : No

Fir damp is composed of which of the following?

Options :

1. ✔ CH_4

2. ✖ CO

3. ✖ CO_2

4. ✖ N_2

Question Number : 107 Question Id : 47720321539 Display Question Number : Yes Is Question Mandatory : No

In an explosive formulation this is an oxidizing agent:

Options :

1. ✖ Charcoal

2. ✔ Aluminium nitrate

3. ✖ Aluminium

4. ✖ Magnesium carbonate

Question Number : 108 Question Id : 47720321540 Display Question Number : Yes Is Question Mandatory : No

Which of the following is a base explosive?

Options :

1. ✖ Gun powder

2. ✖ Nacl

3. ✖ Pottasium nitrate

4. ✔ TNT

Question Number : 109 Question Id : 47720321541 Display Question Number : Yes Is Question Mandatory : No

Drift mining is generally adopted in:

Options :

1. ✖ For the underground mining

2. ✖ For coal mining

3. ✔ In the exploitation of placers

4. ✖ In the exploitation of copper ores

Question Number : 110 Question Id : 47720321542 Display Question Number : Yes Is Question Mandatory : No

The width of the ore body which can be economically mined is:

Options :

1. ✖ Assay width

2. ✖ Actual width

3. ✔ Stopping width

4. ✖ Grady width

Question Number : 111 Question Id : 47720321543 Display Question Number : Yes Is Question Mandatory : No

Exploration means:

Options :

1. ✖ Search for ore

2. ✖ Opening up of deposit

3. ✖ Stripping or sinking shaft

4. ✔ Defining extent and value of ore body

Question Number : 112 Question Id : 47720321544 Display Question Number : Yes Is Question Mandatory : No

Manholes in a mine haulage are to be provided at an interval of not more than:

Options :

1. ✖ 05 m

2. ✔ 10 m

3. ✖ 15 m

4. ✖ 20 m

Question Number : 113 Question Id : 47720321545 Display Question Number : Yes Is Question Mandatory : No

Spacing of blast holes should be how many times the burden of holes in opencast mining?

Options :

1. ✖ 1.2

2. ✖ 1.4

3. ✔ 1.5

4. ✖ 1.6

Question Number : 114 Question Id : 47720321546 Display Question Number : Yes Is Question Mandatory : No

Outer surficial layer of the earth crust is called:

Options :

1. ✖ Mantle

2. ✔ Sial

3. ✖ Core

4. ✖ Crust

Question Number : 115 Question Id : 47720321547 Display Question Number : Yes Is Question Mandatory : No

Most authentic method for age determination of earth is:

Options :

1. ✖ Salinity of ocean

2. ✖ Rate of sedimentation

3. ✔ Radio active age dating method

4. ✖ Rate of cooling of earth

Question Number : 116 Question Id : 47720321548 Display Question Number : Yes Is Question Mandatory : No

On the basis of different age determination, the age of earth is estimated about:

Options :

1. ✖ 5000 years

2. ✔ 4600 million years

3. ✖ 1000 years

4. ✖ 100 million years

Question Number : 117 Question Id : 47720321549 Display Question Number : Yes Is Question Mandatory : No

A part of any stream or rock that is exposed at the surface is known as:

Options :

1. ✔ Outcrop

2. ✖ Fault

3. ✖ Fold

4. ✖ Dyke

Question Number : 118 Question Id : 47720321550 Display Question Number : Yes Is Question Mandatory : No

Which fold has got two hinges?

Options :

1. ✖ Fan fold

2. ✖ Box fold

3. ✖ Chevron fold

4. ✔ Isoclinal fold

Question Number : 119 Question Id : 47720321551 Display Question Number : Yes Is Question Mandatory : No

When the strike of the fault is parallel to strike of the rock beds, the faults are called:

Options :

1. ✖ Strike slip fault

2. ✖ Dip slip fault

3. ✔ Strike fault

4. ✖ Diagonal fault

Question Number : 120 Question Id : 47720321552 Display Question Number : Yes Is Question Mandatory : No

Rocks that are formed by cooling of molten material (called magma) at or relatively near the earth's surface is called:

Options :

1. ✖ Sedimentary rocks

2. ✔ Igneous rocks

3. ✖ Metamorphic rocks

4. ✖ Crystalline

Question Number : 121 Question Id : 47720321553 Display Question Number : Yes Is Question Mandatory : No

The geological age of Gondwana rocks is believed to be during:

Options :

1. ✔ Cargoniferous to Jurassic

2. ✖ Archaeans to Cambrians

3. ✖ Cambrian to Sulirian

4. ✖ Cretaceous to Pliocene

Question Number : 122 Question Id : 47720321554 Display Question Number : Yes Is Question Mandatory : No

The study of fossils and their proper utilization in elucidating the past history of earth is called:

Options :

1. ✔ Palaeontology

2. ✖ Minerology

3. ✖ Structural geology

4. ✖ Petrology

Question Number : 123 Question Id : 47720321555 Display Question Number : Yes Is Question Mandatory : No

Which mineral is an iron ore?

Options :

1. ✖ Bauxite

2. ✔ Haematite

3. ✖ Malachite

4. ✖ Galena

Question Number : 124 Question Id : 47720321556 Display Question Number : Yes Is Question Mandatory : No

Bauxite is related to which of the following:

Options :

1. ✔ Aluminium

2. ✖ Manganese

3. ✖ Lead

4. ✖ Tin

Question Number : 125 Question Id : 47720321557 Display Question Number : Yes Is Question Mandatory : No

Coal seams are normally found in:

Options :

1. ✖ Metamorphic rocks

2. ✖ Igneous rocks

3. ✔ Sedimentary rocks

4. ✖ Crystalline

Question Number : 126 Question Id : 47720321558 Display Question Number : Yes Is Question Mandatory : No

While using shuttle cars and joy loader in inclined coal seams, the shape of the pillar shall be:

Options :

1. ✔ Rhombus

2. ✖ Rectangle

3. ✖ Circular

4. ✖ Square

Question Number : 127 Question Id : 47720321559 Display Question Number : Yes Is Question Mandatory : No

Which of the following factor has to be considered for deciding the size of the panel?

Options :

1. ✖ Depth of the seam

2. ✖ Thickness of the seam

3. ✖ Output required

4. ✔ Incubation period

Question Number : 128 Question Id : 47720321560 Display Question Number : Yes Is Question Mandatory : No

Which of the following machine is not used in Longwall mining?

Options :

1. ✖ Shearer

2. ✖ Armoured flexible conveyor

3. ✔ SDL

4. ✖ Plough

Question Number : 129 Question Id : 47720321561 Display Question Number : Yes Is Question Mandatory : No

Which of the following is related to longwall advancing?

Options :

1. ✖ Stook

2. ✖ Robbing

3. ✔ Stable

4. ✖ Splitting

Question Number : 130 Question Id : 47720321562 Display Question Number : Yes Is Question Mandatory : No

Over 90% of underground coal production in India is from which of the following method?

Options :

1. ✖ Long wall method

2. ✔ Bord and pillar method

3. ✖ Hydraulic mining method

4. ✖ Blasting gallery method

Question Number : 131 Question Id : 47720321563 Display Question Number : Yes Is Question Mandatory : No

The type of reserve which is considered to calculate life of mine is

Options :

1. ✔ Commercial reserve

2. ✖ Geological reserve

3. ✖ Workable reserve

4. ✖ Inherent reserve

Question Number : 132 Question Id : 47720321564 Display Question Number : Yes Is Question Mandatory : No

Road inside a coal seam is called:

Options :

1. ✖ Travelling road

2. ✖ Haulage road

3. ✖ Drift

4. ✔ Gallery

Question Number : 133 Question Id : 47720321565 Display Question Number : Yes Is Question Mandatory : No

Over-riding of pillars and maximum risk of premature collapse is with:

Options :

1. ✖ Short wall method

2. ✖ Long wall

3. ✔ Bord and pillar

4. ✖ Sub-level caving

Question Number : 134 Question Id : 47720321566 Display Question Number : Yes Is Question Mandatory : No

In Blasting Gallery Method, which of the following drilling pattern is adopted?

Options :

1. ✖ Burn cut pattern

2. ✔ Ring hole pattern

3. ✖ Wedge cut pattern

4. ✖ Coromant cut pattern

Question Number : 135 Question Id : 47720321567 Display Question Number : Yes Is Question Mandatory : No

Between two panels, what is the minimum size of barrier?

Options :

1. ✖ Equal to width of gallery size

2. ✖ Equal to dimension of panel

3. ✔ Equal to face dimension

4. ✖ Equal to pillar size

Question Number : 136 Question Id : 47720321568 Display Question Number : Yes Is Question Mandatory : No

The pillar left to support the upper level is called?

Options :

1. ✖ Sill pillar

2. ✔ Crown pillar

3. ✖ Rib pillar

4. ✖ Protective pillar

Question Number : 137 Question Id : 47720321569 Display Question Number : Yes Is Question Mandatory : No

The method of stoping suitable for thick ore body , strong ore stable handing and foot wall steeply dipping ore is

Options :

1. ✖ Open stoping

2. ✖ Shrinkage stoping

3. ✖ Cut and fill stoping

4. ✔ Sublevel stoping

Question Number : 138 Question Id : 47720321570 Display Question Number : Yes Is Question Mandatory : No

The maximum thickness of the ore body that can be worked with room and pillar method is?

Options :

1. ✖ 2m

2. ✖ 6m

3. ✖ 10m

4. ✔ 12m

Question Number : 139 Question Id : 47720321571 Display Question Number : Yes Is Question Mandatory : No

The method of stoping successfully applied to all dips from horizontal to vertical is?

Options :

1. ✖ Rill stoping

2. ✔ Breast stoping

3. ✖ Overhand stoping

4. ✖ Underhand stoping

Question Number : 140 Question Id : 47720321572 Display Question Number : Yes Is Question Mandatory : No

The method which employs horizontal openings is:

Options :

1. ✖ shrinkage stoping

2. ✖ sublevel stoping

3. ✔ room and pillar mining

4. ✖ cut and fill stoping

Question Number : 141 Question Id : 47720321573 Display Question Number : Yes Is Question Mandatory : No

In VCR method of mining the charge length to diameter ratio is restricted to:

Options :

1. ✖ 2:1

2. ✖ 4:1

3. ✖ 8:1

4. ✔ 6:1

Question Number : 142 Question Id : 47720321574 Display Question Number : Yes Is Question Mandatory : No

When the core sample from the ore and wall is tested low, we adopt:

Options :

1. ✖ Shrinkage stoping

2. ✖ Block caving

3. ✖ Sub level stoping

4. ✔ Cut and fill stoping

Question Number : 143 Question Id : 47720321575 Display Question Number : Yes Is Question Mandatory : No

Vertical crater retreat method is a modified version of:

Options :

1. ✔ Sublevel

2. ✖ Cut and fill

3. ✖ Block caving

4. ✖ Stope

Question Number : 144 Question Id : 47720321576 Display Question Number : Yes Is Question Mandatory : No

The draw point spacing in caving method is dependent on:

Options :

1. ✖ Mechanization used

2. ✖ Length of the stope

3. ✖ Area of the influence of draw point

4. ✔ Size of the ore broken

Question Number : 145 Question Id : 47720321577 Display Question Number : Yes Is Question Mandatory : No

Soutirage mining is also known as:

Options :

1. ✖ Sublevel stoping

2. ✔ Integral caving

3. ✖ Block caving

4. ✖ Blasting gallery

Question Number : 146 Question Id : 47720321578 Display Question Number : Yes Is Question Mandatory : No

Which diagram explain the Limits of explosibility of methane ?

Options :

1. ✖ Grahams

2. ✖ Le chetelier

3. ✔ Coward

4. ✖ Palvalov

Question Number : 147 Question Id : 47720321579 Display Question Number : Yes Is Question Mandatory : No

Permissible concentration of CO gas in Indian underground mine is:

Options :

1. ✔ 50 ppm

2. ✖ 50.25 ppm

3. ✖ 500 ppm

4. ✖ 550 ppm

Question Number : 148 Question Id : 47720321580 Display Question Number : Yes Is Question Mandatory : No

Which one of the following compositions of methane in air is most explosive in nature?

Options :

1. ✖ 8.5% by volume

2. ✔ 9.5% by volume

3. ✖ 10.5% by volume

4. ✖ 11.5% by volume

Question Number : 149 Question Id : 47720321581 Display Question Number : Yes Is Question Mandatory : No

Black damp is a mixture of:

Options :

1. ✖ Carbon monoxide and excess nitrogen

2. ✖ Carbon dioxide and carbon monoxide

3. ✖ Carbon dioxide and hydrogen sulphide

4. ✔ Carbon dioxide and excess nitrogen

Question Number : 150 Question Id : 47720321582 Display Question Number : Yes Is Question Mandatory : No

The limits of inflammability of fire damp in air are:

Options :

1. ✔ 5.4% and 14.8%

2. ✖ 4.5% and 15.4%

3. ✖ 3.8% and 14.8%

4. ✖ 4.5% and 12.8%

Question Number : 151 Question Id : 47720321583 Display Question Number : Yes Is Question Mandatory : No

MSA D-6 Methanometer works on the principle of:

Options :

1. ✔ Wheatstone bridge circuit

2. ✖ Length of flame

3. ✖ Refractive index of methane

4. ✖ Analysing cell containing MnO2+CuO

Question Number : 152 Question Id : 47720321584 Display Question Number : Yes Is Question Mandatory : No

Which of the following instrument is used to measure the cooling power of mine air?

Options :

1. ✖ Manometer

2. ✖ Velometer

3. ✔ Kata Thermometer

4. ✖ Pitot tube

Question Number : 153 Question Id : 47720321585 Display Question Number : Yes Is Question Mandatory : No

Class B fires involves:

Options :

1. ✖ Gaseous fuels like LPG gas, butane etc.

2. ✖ Melting iron

3. ✖ Live electrical equipments

4. ✔ Inflammable liquids like diesel, petrol etc.

Question Number : 154 Question Id : 47720321586 Display Question Number : Yes Is Question Mandatory : No

In a gas mask, cotton wool removes:

Options :

1. ✖ Water vapour

2. ✖ Ammonia

3. ✔ Dust and smoke

4. ✖ Hydrogen sulphide

Question Number : 155 Question Id : 47720321587 Display Question Number : Yes Is Question Mandatory : No

In a self-contained breathing apparatus, which valve allows the escape of any oxygen in excess of the wearers requirement?

Options :

1. ✖ Inhalation valve

2. ✔ Relief valve

3. ✖ Exhalation valve

4. ✖ Main valve

Question Number : 156 Question Id : 47720321588 Display Question Number : Yes Is Question Mandatory : No

The air travel from the rise side of a district to the lower levels along the working places is referred as:

Options :

1. ✖ Ascentional ventilation

2. ✔ Descentional ventilation

3. ✖ Artificial ventilation

4. ✖ Reverse ventilation

Question Number : 157 Question Id : 47720321589 Display Question Number : Yes Is Question Mandatory : No

Modern flame safety lamp can withstand an air velocity of.....

Options :

1. ✖ 10 m/s

2. ✖ 11.5 m/s

3. ✖ 12.5 m/s

4. ✔ 14 m/s

Question Number : 158 Question Id : 47720321590 Display Question Number : Yes Is Question Mandatory : No

If the CO/CO2 deficiency ratio in a mine is 2.25%, it indicates:

Options :

1. ✔ Existence of spontaneous heating

2. ✖ Active fire

3. ✖ Heating in advanced stage

4. ✖ Normal to the coal mine

Question Number : 159 Question Id : 47720321591 Display Question Number : Yes Is Question Mandatory : No

For an explosion proof stopping, D.G.M.S recommended a minimum brick wall-thickness of:

Options :

1. ✖ 1.0 m

2. ✖ 1.5 m

3. ✖ 2.5 m

4. ✔ 3.0 m

Question Number : 160 Question Id : 47720321592 Display Question Number : Yes Is Question Mandatory : No

Foam type fire extinguishers are not used for fighting:

Options :

1. ✖ Oil fire

2. ✖ Timber fire

3. ✔ Electrical fire

4. ✖ Melting iron

Question Number : 161 Question Id : 47720321593 Display Question Number : Yes Is Question Mandatory : No

A line which checks the accuracy of the frame work and enables the surveyor to locate the interior details which are far away from the main chain line is called as:

Options :

1. ✖ Check line

2. ✖ Perpendicular line

3. ✔ Tie line

4. ✖ Offset

Question Number : 162 Question Id : 47720321594 Display Question Number : Yes Is Question

Mandatory : No

When the instrument is correctly levelled, the height of plane of collimation is synonymous with:

Options :

1. ✔ Height of instrument

2. ✖ Plus sight

3. ✖ Turning point

4. ✖ Intermediate sight

Question Number : 163 Question Id : 47720321595 Display Question Number : Yes Is Question Mandatory : No

Which of the following system is used to working out the reduced levels of points from the staff readings taken in field?

Options :

1. ✖ Bench marking

2. ✔ Rise and fall system

3. ✖ Ranging system

4. ✖ Reconnaissance

Question Number : 164 Question Id : 47720321596 Display Question Number : Yes Is Question Mandatory : No

The horizontal angle between the true median and a line is:

Options :

1. ✖ Magnetic meridian

2. ✖ Arbitrary meridian

3. ✔ Azimuth

4. ✖ Whole circle angle

Question Number : 165 Question Id : 47720321597 Display Question Number : Yes Is Question Mandatory : No

By which rule, the total error in latitude and departure is distributed in proportion to length of sides:

Options :

1. ✔ Bowditch rule

2. ✖ Transit rule

3. ✖ Centesimal rule

4. ✖ Reversal point rule

Question Number : 166 Question Id : 47720321598 Display Question Number : Yes Is Question Mandatory : No

Fixed hair rule and modified hair rule methods are the classifications of which method of tachometry:

Options :

1. ✖ Inclined sights

2. ✖ Tangential method

3. ✖ Vernier scaling method

4. ✔ Stadia method

Question Number : 167 Question Id : 47720321599 Display Question Number : Yes Is Question Mandatory : No

Which is the instrument used in in finding the area of plots, especially when the boundaries are irregular or curved ?

Options :

1. ✖ Compass

2. ✖ Coniometer

3. ✖ Theodolite

4. ✔ planimeter

Question Number : 168 Question Id : 47720321600 Display Question Number : Yes Is Question Mandatory : No

In weissbach triangle method of correlation, the number of shafts used for correlation are:

Options :

1. ✖ Two

2. ✔ one

3. ✖ Three

4. ✖ Four

Question Number : 169 Question Id : 47720321601 Display Question Number : Yes Is Question Mandatory : No

The main principle of surveying is to work from:

Options :

1. ✖ Part to whole

2. ✔ Whole to part

3. ✖ Higher to lower level

4. ✖ Lower to higher level

Question Number : 170 Question Id : 47720321602 Display Question Number : Yes Is Question Mandatory : No

The upper plate of theodolite is fixed to:

Options :

1. ✔ inner spindle

2. ✖ Levelling head

3. ✖ outer spindle

4. ✖ Tripod

Question Number : 171 Question Id : 47720321603 Display Question Number : Yes Is Question Mandatory : No

The parallax can be removed by:

Options :

1. ✖ Focusing the eyepiece

2. ✖ Focusing the objective

3. ✖ By centring and levelling

4. ✔ Focusing both the eyepiece and objective

Question Number : 172 Question Id : 47720321604 Display Question Number : Yes Is Question Mandatory : No

A deflection angle is:

Options :

1. ✖ Always between 90 and 180 degrees

2. ✔ Difference between included angle and 180 degrees

3. ✖ Less than 90 degrees

4. ✖ Difference between 360 degree and included angle

Question Number : 173 Question Id : 47720321605 Display Question Number : Yes Is Question Mandatory : No

While taking a back sight, the screw used is:

Options :

1. ✖ Upper tangent

2. ✖ Upper clamp

3. ✖ Vertical clamp

Lower clamp

4. ✔

Question Number : 174 Question Id : 47720321606 Display Question Number : Yes Is Question Mandatory : No

The horizontal angle between two lines is generally measured:

Options :

Clockwise from the backward station

1. ✔

Counter-clockwise from the forward station

2. ✖

Counter-clockwise from the back station

3. ✖

Clockwise from the forward station

4. ✖

Question Number : 175 Question Id : 47720321607 Display Question Number : Yes Is Question Mandatory : No

Which of the following sentence is incorrect?

Options :

The axes of the plate level is perpendicular to the vertical axis

1. ✖

The axis of the altitude level is parallel to the line of collimation when it is horizontal and the vertical circle reads zero

2. ✖

3. ✔ The line of collimation is parallel to the horizontal axis

4. ✖ The horizontal axis is perpendicular to the vertical axis

Question Number : 176 Question Id : 47720321608 Display Question Number : Yes Is Question Mandatory : No

Which one of the following haulages is preferred for undulating roadways:

Options :

1. ✔ Direct rope haulage

2. ✖ Endless ‘haulage

3. ✖ Tail rope haulage

4. ✖ Main and tail rope haulage

Question Number : 177 Question Id : 47720321609 Display Question Number : Yes Is Question Mandatory : No

As per mining regulation, for every shaft exceeding 100 m depth and during hoisting men' the speed should not exceed:

Options :

1. ✖ 0.5 m/s

2. ✔ I m/s

3. ✖ 1.5 m/s

4. ✖ 5 m/s

Question Number : 178 Question Id : 47720321610 Display Question Number : Yes Is Question Mandatory : No

Recapping a winding rope is done to:

Options :

1. ✖ Increase the flexural strength of the rope

2. ✖ Increase the flexibility of the rope.

3. ✔ Remove a portion of the rope subjected to deterioration

4. ✖ Prevent the rope from excessive rusting.

Question Number : 179 Question Id : 47720321611 Display Question Number : Yes Is Question Mandatory : No

Clifton pulley is used in:

Options :

1. ✖ Direct rope haulage

2. ✖ Endless haulage

3. ✖ Main and tail haulage

4. ✔ Gravity haulage

Question Number : 180 Question Id : 47720321612 Display Question Number : Yes Is Question Mandatory : No

Flame trap or flame arrestor is used with:

Options :

1. ✖ Conveyor

2. ✖ Direct haulage

3. ✔ Diesel locomotive

4. ✖ Shaker conveyor

Question Number : 181 Question Id : 47720321613 Display Question Number : Yes Is Question Mandatory : No

Jaw clutch is provided with:

Options :

1. ✖ Tail rope haulage

2. ✔ Direct rope haulage

3. ✖ Endless rope haulage

4. ✖ Gravity haulage

Question Number : 182 Question Id : 47720321614 Display Question Number : Yes Is Question Mandatory : No

Factor of safety required for drum winding to be used for man riding:

Options :

1. ✖ 4

2. ✖ 6

3. ✖ 8

4. ✔ 10

Question Number : 183 Question Id : 47720321615 Display Question Number : Yes Is Question Mandatory : No

With DERD shearer the cut coal is thrown on the armoured face conveyor by:

Options :

1. ✖ Centrifugal face

2. ✖ By the movement of the machine

3. ✖ By the gummer

4. ✔ Deflected by the plough

Question Number : 184 Question Id : 47720321616 Display Question Number : Yes Is Question Mandatory : No

By varying the pitch of the blades, the pressure generated by axial flow fan .....

Options :

1. ✖ Remains same

2. ✖ Decreases

3. ✔ Increases

4. ✖ Decreases to zero

Question Number : 185 Question Id : 47720321617 Display Question Number : Yes Is Question Mandatory : No

The space factor for stranded rope is:

Options :

1. ✖ 30 to 40 %

2. ✔ 40 to 50 %

3. ✖ 50 to 60 %

4. ✖ 65 to 75 %

Question Number : 186 Question Id : 47720321618 Display Question Number : Yes Is Question Mandatory : No

The correct place for tensioning arrangement in endless rope haulage is:

Options :

1. ✖ At the top of the incline

2. ✖ At the bottom of the incline

3. ✖ Any point on the level roadway

At the point where slack rope is most likely to occur

4. ✔

Question Number : 187 Question Id : 47720321619 Display Question Number : Yes Is Question Mandatory : No

Which of the following is correct regarding limiting fleet angle to 1.5°?

Options :

To reduce wear of the winding rope

1. ✔

To reduce side travel on the pulley

2. ✖

To allow maximum persons to travel

3. ✖

Allowing the use of lesser diameter winding rope

4. ✖

Question Number : 188 Question Id : 47720321620 Display Question Number : Yes Is Question Mandatory : No

A continuous miner is a:

Options :

Cutting-cum-loading equipment.

1. ✔

Cutting equipment

2. ✖

3. ✖ Loading equipment.

4. ✖ Transporting equipment

Question Number : 189 Question Id : 47720321621 Display Question Number : Yes Is Question Mandatory : No

The equipment which is not used in Bord and Pillar system of working is:

Options :

1. ✖ side discharge loader.

2. ✖ load haul dumper.

3. ✖ scraper

4. ✔ coal plough

Question Number : 190 Question Id : 47720321622 Display Question Number : Yes Is Question Mandatory : No

Which one of the following powered roof supports does not contain a canopy?

Options :

1. ✔ Chock support

2. ✖

Shield support

3. ✖ Pure shield support

4. ✖ Chock shield support

Question Number : 191 Question Id : 47720321623 Display Question Number : Yes Is Question Mandatory : No

How many litres of water (minimum) per day per person shall be provided to workers by Owner/Agent/ Manager, as per The Mines Rules, 1956?

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 192 Question Id : 47720321624 Display Question Number : Yes Is Question Mandatory : No

Which of the following option is correct regarding quality assurance (QA) and quality control (QC)

Options :

1. ✔

QC is an integral part of QA

2. ✖ QA is an integral part of QC

3. ✖ QA and QC are independent to each other

4. ✖ QC may or may not depend on QA

Question Number : 193 Question Id : 47720321625 Display Question Number : Yes Is Question Mandatory : No

Which Act provides for appointment of conciliation officers and adjudication authorities?

Options :

1. ✖ The Factories Act,1948

2. ✔ The Industrial Disputes Act, 1947

3. ✖ The Trades Unions Act, 1926

4. ✖ The Mines Act, 1952

Question Number : 194 Question Id : 47720321626 Display Question Number : Yes Is Question Mandatory : No

Which one of the following is correct regarding minimum standard of illumination in lux for haul roads, for dumper trucks in an opencast mine?

Note: H-horizontal

Options :

1. ✔ 10 H

2. ✖ 15 H

3. ✖ 20 H

4. ✖ 25 H

Question Number : 195 Question Id : 47720321627 Display Question Number : Yes Is Question Mandatory : No

With permission of Chief Inspector, number of hours of work (including interval for rest) in any one day for above ground shall not exceed:

Options :

1. ✖ 12

2. ✔ 14

3. ✖ 15

4. ✖ 16

Question Number : 196 Question Id : 47720321628 Display Question Number : Yes Is Question

Mandatory : No

The register required for the details of overtime to be maintained in:

Options :

1. ✔ Form I

2. ✖ Form J

3. ✖ Form K

4. ✖ Form L

Question Number : 197 Question Id : 47720321629 Display Question Number : Yes Is Question Mandatory : No

The owner/agent/manager shall appoint a suitably qualified person as a welfare officer, wherein ordinarily persons employed are:

Options :

1. ✖ 600 or more

2. ✔ 500 or more

3. ✖ 200 or more

4. ✖ 100 or more

Question Number : 198 Question Id : 47720321630 Display Question Number : Yes Is Question

Mandatory : No

Every mine manager of an underground mine shall be assisted by a safety officer to promote safety and safe practices in the mine when the output exceeds per month?

Options :

1. ✖ 1000 tons

2. ✖ 3000 tons

3. ✖ 8000 tons

4. ✔ 5000 tons

Question Number : 199 Question Id : 47720321631 Display Question Number : Yes Is Question Mandatory : No

The renewal period for wage agreement in years for workers in coal mines presently is:

Options :

1. ✖ 3

2. ✖ 4

3. ✔ 5

4. ✖ 6

Question Number : 200 Question Id : 47720321632 Display Question Number : Yes Is Question Mandatory : No

How many years of practical experience Superintendent of Rescue Station should have in below ground mines?

Options :

1. ✖ 1 year

2. ✖ 3 years

3. ✖ 4 years

4. ✔ 5 years