

Telangana State Council of Higher Education

TS ECET [FDH & B.Sc. (Mathematics)] - 2018

Date of Examination: 09-05-2018

Time of Examination: 10.00 A.M. to 1.00 P.M.

**Master Question Paper Copy**

**Mining Engineering**

**Notations :**

1. Options shown in green color and with ✓ icon are correct.
2. Options shown in red color and with ✗ icon are incorrect.

Question Number : 1 Question Id : 5105297013 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If A is square matrix of order 3 and if the matrix obtained by replacing the elements of A with

their corresponding cofactors is  $\begin{bmatrix} 1 & -2 & 1 \\ 4 & -5 & -2 \\ -2 & 4 & 1 \end{bmatrix}$  then determinant of A is \_\_\_\_\_

**Options :**

1. ✗ 9
2. ✗ 16
3. ✓ 3
4. ✗ 4

Question Number : 2 Question Id : 5105297014 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The system of equations  $x + y + z = 6$ ,  $x + 2y + 3z = 10$ ,  $x + 2y + \lambda z = K$  is

inconsistent for  $\lambda = l$  and  $K \neq m$ , then  $(l, m) =$

Options :

1. ✘ (3, 7)
2. ✔ (3, 10)
3. ✘ (7, 10)
4. ✘ (10, 4)

Question Number : 3 Question Id : 5105297015 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If A is a square matrix of order n and  $A = P + Q$ , where P is symmetric and Q is non symmetric

matrices, then  $P - Q =$

Options :

1. ✘ A
2. ✔  $A^T$
3. ✘  $A + A^T$
4. ✘  $A - A^T$

Question Number : 4 Question Id : 5105297016 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & x \\ -2 & y & -1 \end{bmatrix}$  is orthogonal then \_\_\_\_\_

Options :

1. ✔  $x = -2, y = 2$

2. ✘  $x = -2, y = -2$

3. ✘  $x = 2, y = 2$

4. ✘  $x = 2, y = -2$

Question Number : 5 Question Id : 5105297017 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $X = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & k \end{bmatrix}$  is singular matrix then  $k =$

Options :

1. ✘ 2

2. ✘ 3

3. ✘ 4

4. ✔ 5

Question Number : 6 Question Id : 5105297018 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $\frac{7x-17}{(x-1)(x-3)} = \frac{m}{x-1} + \frac{k}{x-3}$ , then  $m - k - 1 =$

Options :

1. ✘ 1

2. ✔ 2

3. ✘ 3

4. ✘ -2

Question Number : 7 Question Id : 5105297019 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A complex number 'z' having least modulus value and satisfying  $|z - 2 + 2i| = 1$  is \_\_\_\_\_

Options :



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

1. ✘

$$\left(2 + \frac{1}{\sqrt{2}}\right)(1+i)$$

2. ✘

$$\left(2 - \frac{1}{\sqrt{2}}\right)(1-i)$$

3. ✔

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

4. ✘

Question Number : 8 Question Id : 5105297020 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The solution of the simultaneous equations  $x + y = \frac{2\pi}{3}$  and  $\cos x + \cos y = \frac{3}{2}$  where x and y

are real is \_\_\_\_\_

Options :

$$x = \frac{\pi}{3}, y = \pi$$

1. ✘

$$x = \pi, y = \frac{\pi}{3}$$

2. ✘

$$x = \pi, y = \frac{\pi}{2}$$

3. ✘

does not exist.

4. ✔

Question Number : 9 Question Id : 5105297021 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



If both the distinct roots of the equation  $|\sin x|^2 + |\sin x| + b = 0$  in  $[0, \pi]$  are real then all the values of  $b$  lie in the interval \_\_\_\_\_

Options :

1. ✘  $[-2, 0]$
2. ✘  $(-2, 0)$
3. ✘  $[-2, 0)$
4. ✔  $(-2, 0]$

Question Number : 10 Question Id : 5105297022 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

$$\frac{a \cos A + b \cos B + c \cos C}{2s} =$$

Options :

1. ✘  $\Delta$
2. ✘  $\frac{1}{R}$
3. ✔  $\frac{r}{R}$
4. ✘  $\frac{\Delta}{R}$

Question Number : 11 Question Id : 5105297023 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If  $\cos A = \frac{3}{4}$ , then the value of  $32 \sin \frac{A}{2} \cdot \sin \frac{5A}{2}$

Options :

1. ✔ 11

2. ✘ 36

3. ✘ 27

4. ✘ 10

Question Number : 12 Question Id : 5105297024 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $z_1 = 3 (\cos 15^\circ + i \sin 15^\circ)$  and  $z_2 = 5 (\cos 63^\circ + i \sin 63^\circ)$  then  $\frac{z_1}{z_2} =$

Options :

1. ✘  $\frac{3}{5} [\cos 48^\circ + i \sin 48^\circ]$

2. ✔  $\frac{3}{5} [\cos 48^\circ - i \sin 48^\circ]$

3. ✘  $\frac{3}{5} [\cos 78^\circ + i \sin 78^\circ]$

4. ✘  $\frac{5}{3} [\cos 78^\circ - i \sin 78^\circ]$

Question Number : 13 Question Id : 5105297025 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$2 \tan \frac{1}{7} + \tan^{-1} \frac{1}{13} =$

Options :

1. ✔  $\tan^{-1} \frac{23}{61}$

2. ✘  $\tan^{-1} \frac{14}{61}$

3. ✘  $\tan^{-1} \frac{32}{61}$

4. ✘  $\tan^{-1} \frac{3}{51}$

Question Number : 14 Question Id : 5105297026 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\text{If } \cos 20^\circ \cos 40^\circ \cos 80^\circ = p, \text{ then } p =$$

Options :

1. ✘  $\frac{1}{2}$

2. ✘  $\frac{1}{4}$

3. ✔  $\frac{1}{8}$

4. ✘ 1

Question Number : 15 Question Id : 5105297027 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\sin A \sin (120^\circ - A) \sin (120^\circ + A) =$$

Options :

1. ✘  $\frac{1}{4} \sin A$

2. ✔  $\frac{1}{4} \sin 3A$

3. ✘  $\frac{1}{4} \cos A$

4. ✘  $\frac{1}{4} \cos 3A$

Question Number : 16 Question Id : 5105297028 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\cos 5^\circ - \sin 25^\circ =$$

Options :

1. ✘  $\sin 30^\circ$



2. ✓  $\sin 35^\circ$

3. ✗  $\sin 45^\circ$

4. ✗  $\sin 55^\circ$

Question Number : 17 Question Id : 5105297029 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $n$  is the length of perpendicular from the point  $(3, -2)$  to the straight line

$L \equiv 12x - 5y + 6 = 0$  and  $m$  is distance of that line  $L=0$  from  $12x - 5y - 7 = 0$ , then \_\_\_\_\_

Options :

1. ✗  $n + m = 2$

2. ✗  $n = m$

3. ✗  $n = 2m$

4. ✓  $n = 4m$

Question Number : 18 Question Id : 5105297030 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The equation of the straight line passing through  $(2, 3)$  and perpendicular to the line

$4x - 3y = 10$  is \_\_\_\_\_

Options :

1. ✗  $3x + 4y + 18 = 0$

2. ✓  $3x + 4y - 18 = 0$

3. ✗  $3x - 4y - 18 = 0$

4. ✗  $3x - 4y + 18 = 0$

Question Number : 19 Question Id : 5105297031 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

L is a straight line passing through the point P(1, 2) such that P bisects the portion of the line intercepted between the coordinate axes, then the perpendicular distance of line L from the origin is \_\_\_\_\_

Options :

1. ✘  $\frac{1}{\sqrt{5}}$

2. ✘  $\frac{2}{\sqrt{5}}$

3. ✘  $\frac{3}{\sqrt{5}}$

4. ✔  $\frac{4}{\sqrt{5}}$

Question Number : 20 Question Id : 5105297032 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the focus of the parabola  $(y-2)^2 = 4(x-1)$  is (a, b), then a+b =

Options :

1. ✘ (-1, -2)

2. ✘ (1, 2)

3. ✘ (2, 1)

4. ✔ (2, 2)

Question Number : 21 Question Id : 5105297033 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The function  $y = |x|$   $-\infty < x < \infty$  is \_\_\_\_\_

Options :

1. ✘ Differentiable at x=0

2. ✘ not continuous at  $x=0$
3. ✔ continuous and differentiable at  $x \neq 0$
4. ✘ continuous but not differentiable at  $x \neq 0$

Question Number : 22 Question Id : 5105297034 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\lim_{x \rightarrow 0} \left( \frac{\sqrt{1 - \cos 2x}}{x} \right)$$

Options :

1. ✔ Does not exist
2. ✘ 1
3. ✘ -1
4. ✘ 0

Question Number : 23 Question Id : 5105297035 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $f(x) = |x^2 - 3x + 2|$  then  $\frac{df}{dx} =$

Options :

1. ✔  $2x-3$  when  $x > 2$
2. ✘  $3-2x$ , when  $x < 1$
3. ✘  $3-2x$  when  $x > 2$
4. ✘  $2x+3$ , when  $1 < x < 2$

Question Number : 24 Question Id : 5105297036 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



If  $Z = \text{Log}_e\left(\frac{xy}{x+y}\right)$ , then  $x\frac{\partial Z}{\partial x} + y\frac{\partial Z}{\partial y} =$

Options :

1. ✘ 0

2. ✘  $2Z$

3. ✔ 1

4. ✘  $\frac{Z}{2}$

Question Number : 25 Question Id : 5105297037 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two cars with equal speed  $V$  started from a place are such that one is moving towards East and the other is moving towards North. The rate at which they are separated from each other when they travel same distance is \_\_\_\_\_

Options :

1. ✔  $V\sqrt{2}$

2. ✘  $\frac{V}{\sqrt{2}}$

3. ✘  $\frac{\sqrt{2}}{V}$

4. ✘  $2V^2$

Question Number : 26 Question Id : 5105297038 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The derivative of  $\sin x^2$  with respect to  $x^5$  is \_\_\_\_\_

Options :

1. ✘  $\frac{\cos x^2}{5x^4}$

2. ✘  $\frac{2 \cos x^2}{5x^4}$

3. ✔  $\frac{2 \cos x^2}{5x^3}$

4. ✘  $\frac{2 \sin x^2}{5x^4}$

Question Number : 27 Question Id : 5105297039 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{y}{x(1-y \log x)}$

2. ✔  $\frac{y^2}{x(1-y \log x)}$

3. ✘  $\frac{y^2}{x(1+y \log x)}$

4. ✘  $\frac{y}{(1-y \log x)}$

Question Number : 28 Question Id : 5105297040 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $x = at^2, y = 2at$ , then  $\frac{d^2y}{dx^2} =$

Options :

1. ✘  $-\frac{1}{t^2}$

2. ✘  $-\frac{1}{2at}$

3. ✔  $-\frac{1}{2at^2}$

4. ✘  $-\frac{1}{2at^4}$

Question Number : 29 Question Id : 5105297041 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $I_1 = \int_0^{\infty} e^{-x} x^n dx$ , then  $\int_0^{\infty} e^{-x^2} x^{2n+1} dx =$

Options :

1. ✘ 0

2. ✔  $\frac{I_1}{2}$

3. ✘  $\frac{I_1}{3}$

4. ✘  $2I_1$

Question Number : 30 Question Id : 5105297042 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $\int \frac{\sin 2x}{\sin 5x \sin 3x} dx = A \log \sin 3x + B \log \sin 5x + C$ , then  $A + B =$

Options :

1. ✘  $2/7$

2. ✘  $1/3$

3. ✘  $-2/5$

4. ✔  $2/15$



Question Number : 31 Question Id : 5105297043 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The area of the region bounded by the curve  $y = x^2 - x$ , x-axis and the line  $x=2$  is \_\_\_\_\_

Options :

1. ✘  $\frac{5}{4}$

2. ✘  $\frac{5}{3}$

3. ✔  $\frac{5}{6}$

4. ✘  $\frac{5}{2}$

Question Number : 32 Question Id : 5105297044 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $0 < x < \frac{\pi}{2}$ , then  $\int \frac{\sin x + \cos x}{\sqrt{1 + \sin 2x}} dx =$

Options :

1. ✘  $\frac{1}{x} + c$

2. ✔  $x + c$

3. ✘  $2x + c$

4. ✘  $\frac{2}{x} + c$

Question Number : 33 Question Id : 5105297045 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$\int \frac{x^4 + 1}{x^2 + 1} dx =$

Options :

1. ✘  $\frac{x^3}{3} + x + 2 \tan^{-1} x + c$

2. ✘  $\frac{x^3}{3} + x + \tan^{-1}x + c$

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

4. ✘  $\frac{x^3}{3} - x + \tan^{-1}x + c$

Question Number : 34 Question Id : 5105297046 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\int \frac{e^x(1-x)}{x^2} dx =$$

Options :

1. ✘  $-\frac{1}{xe^x} + C$

2. ✘  $\frac{1}{xe^x} + C$

3. ✔  $-\frac{1}{x}e^x + C$

4. ✘  $xe^x + C$

Question Number : 35 Question Id : 5105297047 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx =$$

Options :

1. ✔  $\frac{\pi}{4}$

2. ✘  $\frac{\pi}{6}$

3. ✘  $\frac{\pi}{8}$

4. ✘  $\pi$

Question Number : 36 Question Id : 5105297048 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$$\int_0^{\pi/2} \sin^4 x \cos^2 x \, dx =$$

Options :

1. ✘  $\frac{\pi}{12}$

2. ✔  $\frac{\pi}{32}$

3. ✘  $\frac{\pi}{42}$

4. ✘  $\frac{\pi}{2}$

Question Number : 37 Question Id : 5105297049 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The solution of  $(x + 2y^3) \frac{dy}{dx} = y$

Options :

1. ✘  $y = x^3 + cx$

2. ✔  $x = y^3 + cy$

3. ✘  $x = y^2 + cy$

4. ✘  $y = x^3 + cy^2$

Question Number : 38 Question Id : 5105297050 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



The general solution of  $\frac{dy}{dx} = \frac{x^2 + 4x - 9}{x + 2}$  is \_\_\_\_\_

Options :

1. ✘  $y = (x + 2)^2 - 13 \log|x + 2| + c$

2. ✘  $y = (x + 2)^2 - 5 \log|x + 2| + c$

3. ✘  $y = \frac{x^2}{2} + 2x + 13 \log|x + 2| + c$

4. ✔  $y = \frac{x^2}{2} + 2x - 13 \log|x + 2| + c$

Question Number : 39 Question Id : 5105297051 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The differential equation representing the family of curves  $y^2 = 2c(x + \sqrt{c})$ , where c being a positive parameter is of \_\_\_\_\_

Options :

1. ✘ Order 3

2. ✘ Order 2

3. ✔ degree 3

4. ✘ degree 1

Question Number : 40 Question Id : 5105297052 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The differential equation formed by eliminating the arbitrary constants a and b from the

Equation  $\frac{x}{a} + \frac{y}{b} = 1$  is \_\_\_\_\_

Options :

1. ✘  $x y' = 1$

2. ✘  $x y'' = 0$

3. ✔  $y'' = 0$

4. ✘  $y'' = 1$

Question Number : 41 Question Id : 5105297053 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The solution of the differential equation  $\frac{dy}{dx} = (1+x^2)(1+y^2)$  is \_\_\_\_\_

Options :

1. ✔  $\tan^{-1}y = x + \frac{x^3}{3} + c$

2. ✘  $\tan^{-1}y = x - \frac{x^3}{3} + c$

3. ✘  $\cot^{-1}y = x + \frac{x^3}{3} + c$

4. ✘  $\sin^{-1}y = x + \frac{x^3}{3} + c$

Question Number : 42 Question Id : 5105297054 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The solution of the differential equation  $y dx - x dy + \log x dx$  is \_\_\_\_\_

Options :

1. ✘  $c x + y + (1 - \log x) = 0$

2. ✔  $c x - y - (1 + \log x) = 0$

3. ✘  $c y + x + \log x - 1 = 0$

4. ✘  $c x - y + (1 + \log x) = 0$



Question Number : 43 Question Id : 5105297055 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The general solution of the equation  $(D^2 - D - 2)y = \sin 2x$ ,  $(D = \frac{d}{dx})$  is \_\_\_\_\_

Options :

1. ✓  $y = c_1 e^{-x} + c_2 e^{2x} + \frac{1}{20}(\cos 2x - 3\sin 2x)$
2. ✗  $y = c_1 e^{-x} + c_2 e^{-2x} + \frac{1}{20}(\cos 2x + 3\sin 2x)$
3. ✗  $y = c_1 e^{-x} + c_2 e^{2x} + \frac{1}{20}(\cos 2x - 3\sin 3x)$
4. ✗  $y = c_1 e^x + c_2 e^{-2x} + \frac{1}{20}(\cos 2x + 3\sin 2x)$

Question Number : 44 Question Id : 5105297056 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The particular integral of  $(D^2 - 5D + 6)y = e^{4x}$  is \_\_\_\_\_

Options :

1. ✗  $e^{4x}$
2. ✗  $-e^{4x}$
3. ✓  $\frac{1}{2}e^{4x}$
4. ✗  $\frac{1}{4}e^{4x}$

Question Number : 45 Question Id : 5105297057 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $L[f(t)]$  denotes the Laplace Transform of  $f(t)$ , then  $L[t^2 e^{-2t}] =$

Options :

1. ✗  $\frac{1}{(s+2)^3}$



2. ✓  $\frac{2}{(s+2)^3}$

3. ✗  $\frac{1}{(s+2)^2}$

4. ✗  $\frac{2}{(s+2)^2}$

Question Number : 46 Question Id : 5105297058 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$f : \mathbb{R} \rightarrow \mathbb{R}$ ,  $f(x) = x^2$ ,  $-\pi \leq x \leq \pi$  and  $f(x + 2\pi) = f(x)$ ,  $\forall x \in \mathbb{R}$ . If the Fourier series of

$f(x)$  is represented as  $f(x) = \sum_{n=0}^{\infty} a_n \cos nx$ , then  $a_0 =$  \_\_\_\_\_

Options :

1. ✗  $\frac{2\pi^2}{3}$

2. ✓  $\frac{\pi^2}{3}$

3. ✗  $\frac{4\pi^2}{3}$

4. ✗  $\frac{5\pi^2}{3}$

Question Number : 47 Question Id : 5105297059 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$f(t) = 2t^2 - 5$ ,  $-2 \leq t \leq 2$  and  $f(t + 4) = f(t)$ . If  $2t^2 - 5 = \sum_{n=0}^{\infty} A_n \cos\left(\frac{n\pi t}{2}\right)$ , then  $A_1 =$

Options :

1. ✗ 0

2. ✓  $\frac{-32}{\pi^2}$

3. ✗  $\frac{1-(-1)^n}{n} \frac{2}{\pi^2}$

4. ✗  $\frac{16}{\pi^2}$

Question Number : 48 Question Id : 5105297060 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the Laplace transform of a function  $f(t)$  is  $F(S)$ , then  $\int_0^{\infty} f(t)dt =$

Options :

1. ✗  $F(1)$

2. ✗  $F(\infty)$

3. ✓  $F(0)$

4. ✗  $F(S-1)$

Question Number : 49 Question Id : 5105297061 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Mean deviation from median for the data 340, 150, 210, 240, 300, 310, 320

is approximately equal to \_\_\_\_\_

Options :

1. ✓ 52.8

2. ✗ 54.8

3. ✗ 53.8

4. ✗ 51.8

Question Number : 50 Question Id : 5105297062 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two numbers are chosen at random from  $\{1, 2, 3, 4, 5, 6, 7, 8\}$  at a time. The probability that smaller of the two numbers is not more than 3 is

Options :

1. ✘  $\frac{7}{14}$

2. ✔  $\frac{9}{14}$

3. ✘  $\frac{8}{14}$

4. ✘  $\frac{10}{14}$

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 51 Question Id : 5105297063 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The dimensional formula for angular momentum is \_\_\_\_\_

Options :

1. ✘  $M L T^{-1}$

2. ✘  $M L^{-1} T^{-1}$

3. ✔  $M L^2 T^{-1}$

4. ✘  $M^1 L^2 T^{-2}$

Question Number : 52 Question Id : 5105297064 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Which of the following has not been expressed in proper unit?

Options :

1. ✘ stress/strain =  $\text{N/m}^2$
2. ✘ surface tension =  $\text{N/m}$
3. ✔ energy =  $\text{Kg} \times \text{m/s}$
4. ✘ pressure =  $\text{N/m}^2$

Question Number : 53 Question Id : 5105297065 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Two adjacent sides of a parallelogram are represented by the two vectors  $\mathbf{I}+2\mathbf{J}+3\mathbf{K}$  and  $3\mathbf{I}-2\mathbf{J}+\mathbf{K}$ . What is the area of the parallelogram?

Options :

1. ✘ 8
2. ✔  $8\sqrt{3}$
3. ✘  $3\sqrt{8}$
4. ✘ 192

Question Number : 54 Question Id : 5105297066 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Given the points  $A = (0, a)$  and  $B = (1, 2)$ , what is the value of  $a$  if the magnitude of the vector  $\overline{AB}$  is 1?

Options :

1. ✘ 3
2. ✔ 1
3. ✘ 4
4. ✘ 2

Question Number : 55 Question Id : 5105297067 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If A and B are perpendicular, vector  $A = 5i+7j-3k$  and  $B = 2i+2j-ak$ . What is the value of a?

Options :

1. ✘ -2

2. ✘ 8

3. ✘ -7

4. ✔ -8

Question Number : 56 Question Id : 5105297068 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A block of mass 2 Kg rests on a rough inclined plane making an angle of  $30^\circ$  with the horizontal. The coefficient of static friction between the block and plane is 0.7. The frictional force on the block is \_\_\_\_\_

Options :

1. ✘ 9.8 N

2. ✔  $0.7 \times 9.8 \times \sqrt{3}$  N

3. ✘  $9.8 \times \sqrt{3}$  N

4. ✘  $0.7 \times 0.9$  N

Question Number : 57 Question Id : 5105297069 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A body sliding on a smooth inclined plane required 4 seconds to reach the bottom starting from rest at the top. How much time does it take to cover one-fourth the distance starting from rest at top?

Options :

1. ✘ 1 second



2. ✓ 2 seconds
3. ✗ 4 seconds
4. ✗ 16 seconds

Question Number : 58 Question Id : 5105297070 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A body of mass 2 Kg is hung on a spring balance mounted vertically in a lift. If the lift descends with an acceleration equal to the acceleration due to gravity  $g$ , the reading on the spring balance will be changed by \_\_\_\_\_

Options :

1. ✗ 2 Kg
2. ✗ 4 Kg
3. ✗  $2/g$  Kg
4. ✓ zero

Question Number : 59 Question Id : 5105297071 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If  $g$  is the acceleration due to gravity at the earth surface, the gain in the potential energy of an object of mass  $m$  is raised, then the surface of the earth to a height equal to the radius  $R$  of earth is \_\_\_\_\_

Options :

1. ✓  $(\frac{1}{2})mgR$
2. ✗  $2mgR$
3. ✗  $mgR$
4. ✗  $(\frac{1}{4})mgR$



Question Number : 60 Question Id : 5105297072 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A ship of mass  $3 \times 10^7 \text{ Kg}$  initially at rest is pulled by a force of  $5 \times 10^4 \text{ N}$  through a distance of 3 m. Assume that the resistance due to water is negligible, the speed of the ship is \_\_\_\_\_

Options :

1. ✘ 1.5 m/s
2. ✘ 60m/s
3. ✔ 0.1 m/s
4. ✘ 5 m/s

Question Number : 61 Question Id : 5105297073 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Clock A is based on oscillations of a spring and clock B is based on pendulum motion. Both clocks run at the same rate on earth. On a planet having the same density as earth but twice the radius, \_\_\_\_\_

Options :

1. ✘ A will run faster than B
2. ✔ B will run faster than A
3. ✘ both run at the same rate as on earth
4. ✘ both run at equal rates but not the same as on earth

Question Number : 62 Question Id : 5105297074 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The potential energy at a point r when a particle is moving under the central force

$F = -Kr^2$  is \_\_\_\_\_

Options :

1. ✘  $K^2/r$

2. ✘  $K/r$
3. ✘  $K/r^2$
4. ✔  $-K/r$

Question Number : 63 Question Id : 5105297075 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

When the body is acted upon by a resultant force, then work done by the resultant force is equal to \_\_\_\_\_

Options :

1. ✘ its initial kinetic energy
2. ✘ its initial potential energy
3. ✘ change in the kinetic energy
4. ✔ change in momentum

Question Number : 64 Question Id : 5105297076 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A Jet engine works on the principle of \_\_\_\_\_

Options :

1. ✘ conservation of energy
2. ✘ conservation of mass
3. ✔ conservation of linear momentum
4. ✘ conservation of angular momentum

Question Number : 65 Question Id : 5105297077 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A Particle is vibrating in simple harmonic motion with an amplitude of 4 cm. At what displacement from the equilibrium position is its energy half potential and half kinetic?



Options :

1. ✘ 1 cm
2. ✘  $\sqrt{2}$ cm
3. ✘ 2 cm
4. ✔  $2\sqrt{2}$  cm

Question Number : 66 Question Id : 5105297078 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The walls of Hall built for music concerns should \_\_\_\_\_

Options :

1. ✘ amplify sound
2. ✘ reflect sound
3. ✘ transmit sound
4. ✔ absorb sound

Question Number : 67 Question Id : 5105297079 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

When a surrounding body and listener approach each other the pitch appears to rise and when they move away from each other pitch appears to decrease. This is known as \_\_\_\_\_

Options :

1. ✔ Doppler's principle
2. ✘ Newton's formula
3. ✘ Interference
4. ✘ Sabine's formula

Question Number : 68 Question Id : 5105297080 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



An engine driver moving towards a wall with a velocity of 50 m/sec., emits a note of 1.2 KHz. Speed of sound in air is 350 m/sec. The frequency of the note after reflection from the wall as heard by the engine driver is \_\_\_\_\_

Options :

1. ✘ 1.2 KHz
2. ✔ 1.6 KHz
3. ✘ 0.24 KHz
4. ✘ 2.4 KHz

Question Number : 69 Question Id : 5105297081 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

What is the maximum number of syllables a person can speak in one second?

Options :

1. ✘ 1
2. ✘ 3
3. ✘ 4
4. ✔ 5

Question Number : 70 Question Id : 5105297082 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The speed of sound in air at NTP is 300m/s, if the air pressure becomes four times then the speed of sound will be \_\_\_\_\_

Options :

1. ✘ 150 m/s
2. ✘ 300 m/s
3. ✔ 600 m/s
4. ✘ 1200 m/s

Question Number : 71 Question Id : 5105297083 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For the efficiency of the Carnot cycle to be maximum, \_\_\_\_\_

Options :

1. ✓ the temperature of the source should be infinity
2. ✗ the temperature of the sink should be infinity
3. ✗ the temperature of the source should be zero
4. ✗ both should be infinity

Question Number : 72 Question Id : 5105297084 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Specific heat of a gas at constant volume  $C_v$  and at constant pressure  $C_p$  are related as

Options :

1. ✗  $C_p/C_v = 1-R/J$
2. ✓  $C_p - C_v = R/J$
3. ✗  $C_p - C_v = J/R$
4. ✗  $C_p + C_v = R/J$

Question Number : 73 Question Id : 5105297085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the pressure remains constant the volume of the gas will \_\_\_\_\_

Options :

1. ✓ increase with the increase in temperature
2. ✗ decrease with the increase in temperature
3. ✗ not change with the temperature
4. ✗ become zero



Question Number : 74 Question Id : 5105297086 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A super conducting material when placed in a magnetic field will \_\_\_\_\_

Options :

1. ✘ attract the magnetic field towards its centre
2. ✘ attract the magnetic field but transfer it into a concentrated zone
3. ✔ repel all the magnetic lines of force passing through it
4. ✘ not influence the magnetic field

Question Number : 75 Question Id : 5105297087 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For long distance communication \_\_\_\_\_

Options :

1. ✘ grand index fibers are more suitable
2. ✔ single mode step index fibers are more suitable
3. ✘ step index fibers are more suitable
4. ✘ silica fibers are more suitable

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 76 Question Id : 5105297088 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The set of quantum number for the 19<sup>th</sup> electron in chromium is \_\_\_\_\_

Options :

1. ✔  $n=4, l=0, m=0, S=+1/2$  or  $-1/2$
2. ✘  $n=3, l=2, m=1, S=+1/2$  or  $-1/2$



3. ✘  $n=3, l=2, m = -1, S=+1/2$  or  $-1/2$

4. ✘  $n=4, l=1, m = 0, S=+1/2$  or  $-1/2$

Question Number : 77 Question Id : 5105297089 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In which of the following compounds, is coordinate covalent bond present?

Options :

1. ✘  $\text{PH}_3$

2. ✘  $\text{H}_2\text{O}$

3. ✔  $\text{NH}_4\text{OH}$

4. ✘  $\text{HBr}$

Question Number : 78 Question Id : 5105297090 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Variable valency is shown by \_\_\_\_\_

Options :

1. ✘ N and O

2. ✔ P and S

3. ✘ F and Cl

4. ✘ N and S

Question Number : 79 Question Id : 5105297091 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the following balanced equation



The values of x, Y, Z would be \_\_\_\_\_

Options :

1. ✘  $x=4, Y=8, Z=5$
2. ✘  $x=6, Y=3, Z=4$
3. ✔  $x=8, Y=4, Z=4$
4. ✘  $x=3, Y=5, Z=4$

Question Number : 80 Question Id : 5105297092 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

50cc of decinormal NaOH solution will be completely neutralised by 'x' ml of  
decimolar  $H_2SO_4$  solution. The value of 'x' is \_\_\_\_\_

Options :

1. ✘ 10
2. ✔ 25
3. ✘ 50
4. ✘ 1

Question Number : 81 Question Id : 5105297093 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Arrange the following in the decreasing order of acidity:

I)  $H_2SO_3$     II)  $H_3PO_4$     III)  $HClO_3$

Options :

1. ✘ I > II > III
2. ✘ II > III > I
3. ✔ III > II > I

4. ✘ I > III > II

Question Number : 82 Question Id : 5105297094 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which anion is the weakest conjugate base?

Options :

1. ✘  $\text{C}_2\text{H}_5\text{O}^\ominus$

2. ✘  $\text{F}^\ominus$

3. ✘  $\text{CH}_3\text{COO}^\ominus$

4. ✔  $\text{NO}_3^\ominus$

Question Number : 83 Question Id : 5105297095 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the preparation of wrought iron from cast iron, the furnace employed is \_\_\_\_\_

Options :

1. ✘ Electrical

2. ✘ Open hearth

3. ✔ Reverberatory

4. ✘ Blast

Question Number : 84 Question Id : 5105297096 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Number of coulombs of current required to convert completely one mole of  $\text{MnO}_4^\ominus$

ions in acid medium to one mole of  $\text{Mn}^{+2}$  ions electrically \_\_\_\_\_

Options :



1. ✘ 96500
2. ✘ 96500 x 2
3. ✘ 96500 x 6
4. ✔ 5 x 96500

Question Number : 85 Question Id : 5105297097 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following elements has the highest value of the electrochemical equivalent?

Options :

1. ✘ Mg
2. ✘ Ca
3. ✔ K
4. ✘ Na

Question Number : 86 Question Id : 5105297098 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The standard reduction potential for  $Zn^{+2}/Zn$  and  $Cu^{+2}/Cu$  electrodes are

-0.76 V and +0.34 V respectively. For the cell reaction  $Zn + Cu^{+2} \rightarrow Zn^{+2} + Cu$  the

standard e.m.f is \_\_\_\_\_

Options :

1. ✔ +1.10 V
2. ✘ -0.42 V

3. ✘ +0.42 V

4. ✘ -1.10 V

Question Number : 87 Question Id : 5105297099 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The type of protection against corrosion applied to marine piers and water box coolers

is \_\_\_\_\_

Options :

1. ✔ Impressed current cathodic protection

2. ✘ Metal rusting

3. ✘ Tinning

4. ✘ Metal painting

Question Number : 88 Question Id : 5105297100 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A metal is dipped separately in different pH solutions of 1, 2, 3 and 4. In which pH solution is the metal easily corroded?

Options :

1. ✔ 1

2. ✘ 2

3. ✘ 3

4. ✘ 4

Question Number : 89 Question Id : 5105297101 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A raw water sample has 300 ppm calcium ions and its  $\text{CaCO}_3$  equivalent in ppm

is \_\_\_\_

Options :

1. ✘ 625

2. ✔ 750

3. ✘ 1500

4. ✘ 25

Question Number : 90 Question Id : 5105297102 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A Process which removes ionic, non ionic, colloidal and organic matter from water

is \_\_\_\_\_

Options :

1. ✘ Ion exchange process

2. ✘ Permutit process

3. ✘ Zeolite process

4. ✔ Reverse osmosis

Question Number : 91 Question Id : 5105297103 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The exhausted anion exchange column in the demineralization process is regenerated

by passing a solution of \_\_\_\_\_

Options :



1. ✘ dil H<sub>2</sub>SO<sub>4</sub>

2. ✘ dil HCl

3. ✔ dil NaOH

4. ✘ dil NH<sub>4</sub>OH

Question Number : 92 Question Id : 5105297104 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which one of the following is not an example of addition polymer?

Options :

1. ✘ Polythene

2. ✔ Terylene

3. ✘ Neoprene

4. ✘ Polystyrene

Question Number : 93 Question Id : 5105297105 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is an example of fibre polymer?

Options :

1. ✘ Rubber

2. ✘ PVC

3. ✘ Bakelite

4. ✔ Nylon-66

Question Number : 94 Question Id : 5105297106 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following can enhance the Physical properties of rubber?

Options :

1. ✘ ZnO
2. ✘ Zn stearate
3. ✔ Sulphur
4. ✘ SiO<sub>2</sub>

Question Number : 95 Question Id : 5105297107 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The basic component of the smog may be \_\_\_\_\_

Options :

1. ✘ O<sub>3</sub>
2. ✔ O<sub>3</sub> + PAN
3. ✘ PAN + SO<sub>2</sub>
4. ✘ O<sub>3</sub> + PAN + SO<sub>3</sub>

Question Number : 96 Question Id : 5105297108 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In Antarctica, Ozone depletion is due to the formation of the following

Compound(s) \_\_\_\_\_

Options :

1. ✘ Chlorine nitrate

2. ✘ PAN
3. ✔ Acrolein
4. ✘ SO<sub>2</sub> and SO<sub>3</sub>

Question Number : 97 Question Id : 5105297109 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The pollutant responsible for smog formation and acid rain is \_\_\_\_\_

Options :

1. ✔ SO<sub>2</sub>
2. ✘ CH<sub>4</sub>
3. ✘ He
4. ✘ SO<sub>2</sub>Cl<sub>2</sub>

Question Number : 98 Question Id : 5105297110 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The normality of 26% (Wt/Vol) solution of ammonia (d=0.55) is approximately \_\_\_\_

Options :

1. ✘ 1.5
2. ✔ 15.3
3. ✘ 0.4
4. ✘ 4

Question Number : 99 Question Id : 5105297111 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Wolframite impurity in Cassiterite is removed by \_\_\_\_\_



Options :

1. ✘ Liqutation
2. ✘ Froth flotation
3. ✔ Electromagnetic separation
4. ✘ Hand picking

Question Number : 100 Question Id : 5105297112 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The highest ranking coal is \_\_\_\_\_

Options :

1. ✔ Anthracite
2. ✘ Lignite
3. ✘ Bituminous
4. ✘ Peat

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 101 Question Id : 5105297113 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following terms is not related to opencast mining?

Options :

1. ✘ Boxcut
2. ✘ Crest

3. ✘ Highwall

4. ✔ Winze

Question Number : 102 Question Id : 5105297114 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The primary purpose of cut holes for blasting in an underground drivage is to \_\_\_\_\_

Options :

1. ✘ Prevent over-breakage

2. ✘ Have smooth surface after blasting

3. ✔ provide additional free face

4. ✘ Reduce noise

Question Number : 103 Question Id : 5105297115 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following supports does not require a power pack for its operation?

Options :

1. ✘ Chock shield support

2. ✘ Closed circuit hydraulic prop

3. ✘ Open circuit hydraulic prop

4. ✔ Friction prop

Question Number : 104 Question Id : 5105297116 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The secondary or tertiary inclined opening, driven to connect levels, usually in a downward direction and used for haulage is \_\_\_\_\_

Options :

1. ✘ Raise



- 2. ✘ Winze
- 3. ✔ Ramp
- 4. ✘ Lateral

Question Number : 105 Question Id : 5105297117 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Delay detonators used in solid blasting have delay range of \_\_\_\_\_

Options :

- 1. ✔ 0-4
- 2. ✘ 0-8
- 3. ✘ 0-10
- 4. ✘ 0-12

Question Number : 106 Question Id : 5105297118 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In an underground coal mine, a freshly exposed roof can be supported by a temporary support in the form of \_\_\_\_\_

Options :

- 1. ✘ Triangular chocks
- 2. ✘ Crew props
- 3. ✘ Hydraulic prop
- 4. ✔ Safari support

Question Number : 107 Question Id : 5105297119 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Match the following:

<u>Drill rod standard</u>	<u>Bore hole Diameter (mm)</u>	<u>Rock Core Diameter (mm)</u>
P. NX	A. 38 mm	i. 21 mm
Q. BX	B. 75 mm	ii. 28 mm
R. AX	C. 47 mm	iii. 54 mm
S. EX	D. 60 mm	iv. 40 mm

Options :

1. ✘ P-B-ii, Q-C-iv, R-D-iii, S-A-i
2. ✔ P-B-iii, Q-D-iv, R-C-ii, S-A-i
3. ✘ P-A-iii, Q-C-iv, R-D-ii, S-B-i
4. ✘ P-D-i, Q-B-iv, R-A-ii, S-C-iii

Question Number : 108 Question Id : 5105297120 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The approach is made in the hilly deposit is

Options :

1. ✘ Crosscut
2. ✘ Tunnel
3. ✘ Drift
4. ✔ Adit

Question Number : 109 Question Id : 5105297121 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Match the following for a drilling system

<u>Component</u>	<u>Function</u>
P. Drill	a. Utilization of energy in fragmentation of rock
Q. Drill rod	b. Reduction of energy loss due to regrinding
R. Drill bit	c. Conversion of original form of energy into mechanical energy
S. Flushing medium	d. Transmission of energy from prime mover to applicator

Options :

1. ✘ P-c, Q-a, R-b, S-d
2. ✔ P-c, Q-d, R-a, S-b
3. ✘ P-d, Q-a, R-c, S-b
4. ✘ P-b, Q-a, R-c, S-d

Question Number : 110 Question Id : 5105297122 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following drilling pattern is generally followed in drivage of small drifts

Options :

1. ✔ Drag cut
2. ✘ Wedge cut
3. ✘ Fan cut
4. ✘ Burn cut

Question Number : 111 Question Id : 5105297123 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



In India, bituminous coal occurs at

Options :

1. ✘ Panadhro
2. ✘ Palana
3. ✔ Jharia
4. ✘ Neyveli

Question Number : 112 Question Id : 5105297124 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the Mohr's scale of hardness, the minerals in increasing sequence of hardness  
are

Options :

1. ✘ Calcite, gypsum, topaz, diamond
2. ✘ Topaz, gypsum, calcite, diamond
3. ✘ Calcite, gypsum, diamond, topaz
4. ✔ Gypsum, calcite, topaz, diamond

Question Number : 113 Question Id : 5105297125 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The lines joining the place of equal intensity of seismic waves are known as

Options :

1. ✘ Seismic line
2. ✔ Isoseismic line
3. ✘ Isogonal line
4. ✘ Isogonic line



Question Number : 114 Question Id : 5105297126 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Barchans are formed due to

Options :

1. ✘ River action
2. ✘ Frost action
3. ✔ Wind action
4. ✘ Sea action

Question Number : 115 Question Id : 5105297127 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The highest rank of coal is

Options :

1. ✔ Anthracite
2. ✘ Bituminous
3. ✘ Sub-bituminous
4. ✘ Lignite

Question Number : 116 Question Id : 5105297128 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A fault in which hanging wall has apparently gone up with respect to the footwall

is termed

Options :

1. ✘ Normal fault
2. ✔ Reverse fault
3. ✘ Dip fault
4. ✘ Strike fault

Question Number : 117 Question Id : 5105297129 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A trough or fold with younger layers closer to the center of the structure is called

Options :

1. ✓ Syncline
2. ✗ Anticline
3. ✗ Outlier
4. ✗ Monocline

Question Number : 118 Question Id : 5105297130 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Tidal hypothesis is proposed by

Options :

1. ✗ Immanuel Kant
2. ✗ Thomas Chamberlin
3. ✓ James Jeans
4. ✗ Schmidt

Question Number : 119 Question Id : 5105297131 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Sulphur deposits are formed due to the process of

Options :

1. ✗ Oxidation
2. ✗ Magmatic concentration
3. ✗ Weathering
4. ✓ Sublimation

Question Number : 120 Question Id : 5105297132 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The most important geophysical method used in exploration of petroleum is



Options :

1. ✘ Gravity method
2. ✔ Seismic method
3. ✘ Magnetic method
4. ✘ Electric method

Question Number : 121 Question Id : 5105297133 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a bord and pillar mining, the width of the pillar and galleries are 19.5 m and 3 m respectively. The percentage of extraction during development is

Options :

1. ✘ 0.3490
2. ✘ 0.5467
3. ✔ 0.2489
4. ✘ 0.4557

Question Number : 122 Question Id : 5105297134 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The most suitable method for high production and high productivity mechanised mining of flat to gently dipping, 1.5 to 4.5 m thick coal seams in favourable geo-mining conditions is

Options :

1. ✘ Bord & Pillar Mining
2. ✘ Room & Pillar Mining
3. ✘ Blasting Gallery Method
4. ✔ Longwall Mining



Question Number : 123 Question Id : 5105297135 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The best method of mining for controlling the subsidence is

Options :

1. ✘ Bord and pillar method
2. ✔ Harmonic mining
3. ✘ Longwall mining with stowing
4. ✘ Longwall mining with caving

Question Number : 124 Question Id : 5105297136 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The fall which takes place soon after withdrawal of supports in an underground coal mine is called as

Options :

1. ✔ Local fall
2. ✘ Main fall
3. ✘ Air blast
4. ✘ Rock burst

Question Number : 125 Question Id : 5105297137 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the context of surface mine development, a box cut is defined as

Options :

1. ✘ The final cut to close the mine
2. ✘ Any cut which must look like an open box
3. ✔ The initial cut made to open a mine
4. ✘ The cut to extend haul road

Question Number : 126 Question Id : 5105297138 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the full surface subsidence is occurred at more than one point then the subsidence is called

Options :

1. ✘ Critical subsidence
2. ✘ Subcritical subsidence
3. ✔ Supercritical subsidence
4. ✘ Trough subsidence

Question Number : 127 Question Id : 5105297139 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a fully mechanisedbord and pillar mining system, winning of coal and its transportation from the face is commonly carried out with the combination of

Options :

1. ✔ Continuous miner, Shuttle car, feeder breaker and belt conveyor
2. ✘ Continuous miner, LHD, feeder breaker and chain conveyor
3. ✘ Continuous miner, SDL, feeder breaker and belt conveyor
4. ✘ Continuous miner, Shuttle car, feeder breaker and chain conveyor

Question Number : 128 Question Id : 5105297140 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Minimum thickness of parting to be left between two sections of a thick coal seam is

Options :

1. ✘ 1 m
2. ✘ 5 m
3. ✘ 7 m



4. ✓ 3 m

Question Number : 129 Question Id : 5105297141 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In case of an opencast blasting, the danger zone comprises of area within the  
radius of

Options :

1. ✗ 300 meters from the place of firing
2. ✗ 400 meters from the place of firing
3. ✓ 500 meters from the place of firing
4. ✗ 600 meters from the place of firing

Question Number : 130 Question Id : 5105297142 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The maximum permissible gradient for the haul road in opencast mines is

Options :

1. ✗ 1 in 12
2. ✗ 1 in 13
3. ✓ 1 in 14
4. ✗ 1 in 15

Question Number : 131 Question Id : 5105297143 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

High production rates coupled with large scale and extensive subsidence results

from the method of

Options :

1. ✗ Top slicing
2. ✓ Block caving



- 3. ✘ Sublevel caving
- 4. ✘ VCR mining

Question Number : 132 Question Id : 5105297144 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The diameter of holes in mm commonly used for ring drilling by drifters in sublevel stoping is between

Options :

- 1. ✘ 25 and 32
- 2. ✘ 33 and 44
- 3. ✘ 45 and 64
- 4. ✔ 65 and 100

Question Number : 133 Question Id : 5105297145 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Top slicing is an underhand caving method which is a variation of

Options :

- 1. ✘ Breast stoping
- 2. ✘ Shrinkage stoping
- 3. ✔ Sublevel stoping
- 4. ✘ Cut and fill stoping

Question Number : 134 Question Id : 5105297146 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A spontaneous and violent fracture of rock that can occur in deep mines is called

Options :

- 1. ✔ Rock burst
- 2. ✘ Bump

3. ✘ Outburst

4. ✘ Air blast

Question Number : 135 Question Id : 5105297147 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The number of components in a stress tensor defining stress at a point in three dimensions is

Options :

1. ✘ 3

2. ✘ 4

3. ✘ 6

4. ✔ 9

Question Number : 136 Question Id : 5105297148 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The ratio of hydrostatic pressure to the volumetric strain is

Options :

1. ✘ Modulus of elasticity

2. ✘ Shear modulus

3. ✔ Bulk Modulus

4. ✘ Poison's ratio

Question Number : 137 Question Id : 5105297149 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The minimum metal percentage, at which mining is profitable, is known as

Options :

1. ✘ Average grade

2. ✔ Cut-off grade



- 3. ✘ Mill grade
- 4. ✘ Economical grade

Question Number : 138 Question Id : 5105297150 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The type of sampling method used for advancing development faces in bedded, banded and vein type deposits is

Options :

- 1. ✔ Channel sampling
- 2. ✘ Chip sampling
- 3. ✘ Grab sampling
- 4. ✘ Blast hole sampling

Question Number : 139 Question Id : 5105297151 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The raising method adopted in metal mines for raises of moderate lengths up to 8 m is

Options :

- 1. ✘ Two or three compartment raising
- 2. ✘ Drop raising method
- 3. ✔ Open raising by drilling, blasting and mucking
- 4. ✘ Raising with Alimak Raise Climber

Question Number : 140 Question Id : 5105297152 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Length to diameter ratio for rock compressive strength test is kept as

Options :

- 1. ✔ 2 to 3

- 2. ✘ 2 to 10
- 3. ✘ 3 to 7
- 4. ✘ 5 to 10

Question Number : 141 Question Id : 5105297153 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

According to standards of ventilation the percentage of oxygen in every place in a mine should not be less than

Options :

- 1. ✘ 18%
- 2. ✔ 19%
- 3. ✘ 20%
- 4. ✘ 21%

Question Number : 142 Question Id : 5105297154 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The period of time that elapses between the application of an ignition source and appearance of the flame is called

Options :

- 1. ✘ Ignition time
- 2. ✘ Incubation period
- 3. ✘ Explosion time
- 4. ✔ Lag on ignition

Question Number : 143 Question Id : 5105297155 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The wet bulb temperature of air at a particular place in an underground mine is  $32^{\circ}$

C, then the velocity of air in that place should not be less than

Options :



1. ✘ 0.5 m/sec
2. ✔ 1 m/sec
3. ✘ 25 m/ min
4. ✘ 45 m/ min

Question Number : 144 Question Id : 5105297156 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is not a type of mechanical ventilator?

Options :

1. ✘ Axial flow fan
2. ✘ Turbo-axial fan
3. ✔ Uni-axial fan
4. ✘ Radial flow fan

Question Number : 145 Question Id : 5105297157 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The ratio between the effective water gauge and theoretical water gauge produced  
by a fan with the same dimension and running at same speed is known as

Options :

1. ✔ Manometric efficiency
2. ✘ Mechanical efficiency
3. ✘ Effective depression
4. ✘ Overall mechanical efficiency

Question Number : 146 Question Id : 5105297158 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The instrument used to determine the velocity pressure is

Options :

1. ✘ Manometer
2. ✘ Barometer
3. ✘ Anemometer
4. ✔ Pitot tube

Question Number : 147 Question Id : 5105297159 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In accumulation test of firedamp, the flame of the flame safety lamp spires or jumps at the gas percentage of

Options :

1. ✘ 1.5
2. ✘ 2.5
3. ✔ 3.0
4. ✘ 4.5

Question Number : 148 Question Id : 5105297160 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The instrument works on the principle of diffusion-combustion-contraction is

Options :

1. ✘ M.S.A. Methanometer
2. ✔ Ring rose firedamp detector
3. ✘ Interferometer
4. ✘ Gas chromatography

Question Number : 149 Question Id : 5105297161 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Mean air temperature of a 500 m deep downcast shaft is  $29^{\circ}\text{C}$  and that of the upcast shaft is  $37^{\circ}\text{C}$ . The height of the motive column in m is

Options :

1. ✓ 12.9
2. ✗ 9.5
3. ✗ 11.6
4. ✗ 8.2

Question Number : 150 Question Id : 5105297162 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A mine fan running at a speed of 300 r.p.m produces  $6000\text{ m}^3/\text{min}$  at 60 mm w-g.

If the fan speed is increased to 400 r.p.m. then the quantity of air flowing at new fan speed is

Options :

1. ✗  $6000\text{ m}^3/\text{min}$
2. ✗  $7000\text{ m}^3/\text{min}$
3. ✓  $8000\text{ m}^3/\text{min}$
4. ✗  $9000\text{ m}^3/\text{min}$

Question Number : 151 Question Id : 5105297163 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The chemical used to cool the air in the self-contained breathing apparatus is

Options :

1. ✗ Sodium chloride
2. ✗ Sodium chlorate
3. ✗ Sodium nitrate
4. ✓ Sodium phosphahate

Question Number : 152 Question Id : 5105297164 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The lowest temperature at which a fine dry coal dust cloud can become inflammable is

Options :

1. ✘ 350°C - 450°C
2. ✔ 700°C - 800°C
3. ✘ 450°C - 600°C
4. ✘ 250°C - 350°C

Question Number : 153 Question Id : 5105297165 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The electrolyte used in a rechargeable type lead-acid battery is

Options :

1. ✔ H<sub>2</sub>SO<sub>4</sub> and distilled water
2. ✘ PbSO<sub>4</sub> and distilled water
3. ✘ PbSO<sub>4</sub>
4. ✘ PbO<sub>2</sub> and distilled water

Question Number : 154 Question Id : 5105297166 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The percentage of additional stone dust required for efficient stone dusting for every 1% firedamp is

Options :

1. ✘ 16 to 20 %
2. ✘ 25 to 30 %
3. ✔ 10 to 14 %



4. ✘ 20 to 25 %

Question Number : 155 Question Id : 5105297167 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The minimum standard of illumination required for the workplace of HEMM's in  
an opencast mine is

Options :

1. ✘ 2 lux

2. ✘ 3 lux

3. ✘ 4 lux

4. ✔ 5 lux

Question Number : 156 Question Id : 5105297168 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The fire extinguisher suitable for use with fires involving inflammable liquids is

Options :

1. ✘ Soda acid fire extinguisher

2. ✘ Water-CO<sub>2</sub> fire extinguisher

3. ✔ Foam type fire extinguisher

4. ✘ CO<sub>2</sub> gas fire extinguisher

Question Number : 157 Question Id : 5105297169 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The lung disease 'Silicosis' is caused by long exposure to

Options :

1. ✘ Coal dust

2. ✔ Quartz dust

3. ✘ Iron oxide dust

4. ✘ asbestos dust

Question Number : 158 Question Id : 5105297170 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The apparatus used to administer pure oxygen to an unconscious person or affected by noxious gases is

Options :

1. ✔ Reviving apparatus
2. ✘ Self rescuer
3. ✘ Self-contained oxygen breathing apparatus
4. ✘ Smoke helmet

Question Number : 159 Question Id : 5105297171 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The gas mask should not be used in an atmosphere which contains

Options :

1. ✘ more than 1% CO
2. ✔ more than 2% CO
3. ✘ more than 3% CO
4. ✘ more than 4% CO

Question Number : 160 Question Id : 5105297172 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The chemical Hopcalite is used in

Options :

1. ✘ Self-contained breathing apparatus
2. ✔ Gas mask
3. ✘ CO detector



4. ✘ MSA methanometer

Question Number : 161 Question Id : 5105297173 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The minimum number of satellites required to locate the position of any object on the earth surface are

Options :

1. ✘ 2

2. ✔ 3

3. ✘ 4

4. ✘ 5

Question Number : 162 Question Id : 5105297174 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In Weisbach quadrilateral method of correlation, the number of shafts used for correlation

Options :

1. ✔ one

2. ✘ two

3. ✘ three

4. ✘ four

Question Number : 163 Question Id : 5105297175 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The magnetic bearing of a line AB is  $132^{\circ} 45'$ . Find the true bearing of the line if the magnetic declination is  $5^{\circ} 30'$  East.

Options :

1. ✘  $127^{\circ} 15'$

2. ✘  $132^{\circ} 45'$

3. ✘  $137^{\circ} 15'$

4. ✔  $138^{\circ} 15'$

Question Number : 164 Question Id : 5105297176 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In case of angular measurements being more precise than the linear measurements,

the traverse can be balanced by

Options :

1. ✘ Bowditch rule

2. ✔ Transit rule

3. ✘ Graphical method

4. ✘ Theodolite correction

Question Number : 165 Question Id : 5105297177 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

To calculate the amount of cut and fill

Options :

1. ✘ Only profile levelling is sufficient

2. ✘ Only cross-sectioning is required

3. ✔ Both profile levelling and cross-sectioning are required

4. ✘ Barometric levelling is required

Question Number : 166 Question Id : 5105297178 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A line lying on the ground surface throughout, and maintaining a constant

inclination to the horizontal is termed as

Options :

1. ✘ Contours



2. ✓ Contour gradient
3. ✗ Horizontal equivalent
4. ✗ Isogonics

Question Number : 167 Question Id : 5105297179 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Overturning of vehicles on a curve can be avoided by using a

Options :

1. ✗ Compound curve
2. ✗ Reverse curve
3. ✗ Vertical curve
4. ✓ Transition curve

Question Number : 168 Question Id : 5105297180 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The method usually adopted to contour a rough country where ordinary levelling is tedious and chaining is slow and inaccurate is

Options :

1. ✓ Tacheometry
2. ✗ Spirit levelling
3. ✗ Differential leveling
4. ✗ Plane tabling

Question Number : 169 Question Id : 5105297181 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is not used in measuring perpendicular offsets?

Options :

1. ✗ Tape

- 2. ✘ Cross-staff
- 3. ✔ Line ranger
- 4. ✘ Optical square

Question Number : 170 Question Id : 5105297182 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The height of instrument method for measuring reducing levels is preferred when

Options :

- 1. ✘ There are no intermediate sights
- 2. ✔ There are large numbers of intermediate sights
- 3. ✘ There are large numbers of fore sights
- 4. ✘ There are no fore sights

Question Number : 171 Question Id : 5105297183 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The type of rope haulage suitable for undulating roadways is

Options :

- 1. ✘ Direct rope haulage
- 2. ✘ Endless rope haulage
- 3. ✘ Gravity haulage
- 4. ✔ Main and tail rope haulage

Question Number : 172 Question Id : 5105297184 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following safety device is used in friction winder?

Options :

- 1. ✘ Regenerative braking



2. ✘ Run-away switch
3. ✔ Lilly controller
4. ✘ Monkey/back catch

Question Number : 173 Question Id : 5105297185 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The lowest ratio of metallic cross-sectional area to rope cross-sectional area occurs in

Options :

1. ✔ Full locked coil rope
2. ✘ Half locked coil rope
3. ✘ Round strand rope
4. ✘ Flattened strand rope

Question Number : 174 Question Id : 5105297186 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The limiting gradient of armoured chain conveyor is

Options :

1. ✘ 1 in 10
2. ✘ 1 in 200
3. ✔ 1 in 3
4. ✘ 1 in 5

Question Number : 175 Question Id : 5105297187 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Axial thrust in a turbine pump acts

Options :

1. ✘ From suction side to delivery side

2. ✓ From delivery side to suction side
3. ✗ Perpendicular to pump shaft
4. ✗ In the delivery pipe

Question Number : 176 Question Id : 5105297188 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following locomotives has compression-ignition type of engine?

Options :

1. ✓ Diesel locomotive
2. ✗ Battery locomotive
3. ✗ Compressed air locomotive
4. ✗ Electric locomotive

Question Number : 177 Question Id : 5105297189 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The effective working of safety detaching hook depends on

Options :

1. ✗ Shackle bolt
2. ✓ Copper pin
3. ✗ Plates movement
4. ✗ Assembly pin

Question Number : 178 Question Id : 5105297190 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The transportation system that can handle large outputs over long distances with

minimum manpower is

Options :

1. ✗ Rope haulage



2. ✘ Chain conveyer
3. ✔ Belt conveyer
4. ✘ Locomotive haulage

Question Number : 179 Question Id : 5105297191 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The sequence of attachments between the winding rope and the cage is

Options :

1. ✘ Detaching hook, capel, bull chains, triangular plate
2. ✘ Triangular plate, bull chains, capel, detaching hook
3. ✘ Bull chains, detaching hook, triangular plate, capel
4. ✔ Capel, detaching hook, bull chains, triangular plate

Question Number : 180 Question Id : 5105297192 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following fitting is common for all the pumps but not required for  
submersible pump?

Options :

1. ✔ Suction pipe
2. ✘ Delivery pipe
3. ✘ Main valve
4. ✘ Retaining valve

Question Number : 181 Question Id : 5105297193 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The voltage used in an intrinsically safe apparatus, shall not exceed

Options :

1. ✘ 440V

- 2. ✘ 250V
- 3. ✘ 110V
- 4. ✔ 30V

Question Number : 182 Question Id : 5105297194 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The speed of the motor of an electric rotary coal drill is reduced by

Options :

- 1. ✘ Bevel gearing
- 2. ✔ Sun and planet gearing
- 3. ✘ Helical gearing
- 4. ✘ Herringbone gearing

Question Number : 183 Question Id : 5105297195 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Of all the protective devices incorporated in a gate-end box, the most important protective device is

Options :

- 1. ✘ Over load protection
- 2. ✘ Leakage protection
- 3. ✔ Earth continuity protection
- 4. ✘ Lower voltage protection

Question Number : 184 Question Id : 5105297196 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In friction winding, the coefficient of friction between the koepe sheave lining and the rope is a minimum of

Options :



1. ✘ 1.5
2. ✘ 1.2
3. ✘ 0.5
4. ✔ 0.2

Question Number : 185 Question Id : 5105297197 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Cowl is the component of

Options :

1. ✔ Shearer
2. ✘ Road header
3. ✘ Winding engine
4. ✘ Armoured face conveyer

Question Number : 186 Question Id : 5105297198 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The type of drum suitable for deep shaft winding to balance the torques on the winding engine is

Options :

1. ✘ Conical drum
2. ✘ Cylindrical drum
3. ✔ Bi-cylindro-conical drum
4. ✘ Cylindro-conical drum

Question Number : 187 Question Id : 5105297199 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The pit-top and pit-bottom arrangement which deals with reasonable output per day and occupies minimum space is

Options :

1. ✘ Run round arrangement
2. ✔ Turn table circuit
3. ✘ Traverse circuit
4. ✘ Back shunt circuit

Question Number : 188 Question Id : 5105297200 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The power supplied to the coal drill is through

Options :

1. ✘ 5 core armoured cable
2. ✘ 3 core armoured cable
3. ✘ 4 core screened cable
4. ✔ 5 core trailing cable

Question Number : 189 Question Id : 5105297201 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The arrangement of the picks in a chain to form lines is known as

Options :

1. ✔ Kerf
2. ✘ Turf
3. ✘ Fleet
4. ✘ Splins

Question Number : 190 Question Id : 5105297202 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



The maximum suitable hauling distance for side discharge loader (SDL) to give best performance is

Options :

1. ✓ upto 25 m of haul distance
2. ✗ upto 50 m of haul distance
3. ✗ upto 75 m of haul distance
4. ✗ upto 100 m of haul distance

Question Number : 191 Question Id : 5105297203 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the context of First Schedule of Coal Mine Regulations, notice of accident/occurrence is given to the authorities, in the prescribed form of

Options :

1. ✗ Form IV-AB
2. ✗ Form V
3. ✓ Form IV-A
4. ✗ Form VI

Question Number : 192 Question Id : 5105297204 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The minimum floor space required for a first aid room in a mine is

Options :

1. ✗  $8 \text{ m}^2$
2. ✓  $10 \text{ m}^2$
3. ✗  $12 \text{ m}^2$

4. ✘  $15 \text{ m}^2$

Question Number : 193 Question Id : 5105297205 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The representative factor of the scale of any mine plan, unless otherwise provided,  
shall be as per C.M.R.

Options :

1. ✔ 1200:1

2. ✘ 3000:1

3. ✘ 4000:1

4. ✘ 5000:1

Question Number : 194 Question Id : 5105297206 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The minimum distance stipulated between two shafts, inclines or outlets of a  
mine is

Options :

1. ✘ 5.5 m

2. ✔ 13.5 m

3. ✘ 19.5 m

4. ✘ 30.5 m

Question Number : 195 Question Id : 5105297207 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the context of project management techniques, the true statement is

Options :

1. ✘ Both CPM and PERT are deterministic

2. ✘ Both CPM and PERT are stochastic



3. ✘ PERT is deterministic and CPM is stochastic
4. ✔ CPM is deterministic and PERT is stochastic

Question Number : 196 Question Id : 5105297208 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The point beyond which the mineral or coal not be economically extracted is called

Options :

1. ✘ Stripping ratio
2. ✘ Limit of extraction
3. ✔ Break-even ratio
4. ✘ Cost of stripping ratio

Question Number : 197 Question Id : 5105297209 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In alluvial soil, morum gravel and clay

Options :

1. ✘ 3 m
2. ✘ 2.5 m
3. ✔ 1.5 m
4. ✘ 1.2 m

Question Number : 198 Question Id : 5105297210 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the percentage of free respirable silica present is 10% in the atmosphere, what is the permissible limit of free silica in milligrams per cubic meter of air sampled?

Options :

1. ✘ 10

2. ✘ 3

3. ✘ 5

4. ✔ 1.5

Question Number : 199 Question Id : 5105297211 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Every detaching bell or plate used in connection with a safety-hook shall be examined, and the opening therein checked by calipers or gauges, once at least in every

Options :

1. ✔ 30 days

2. ✘ 3 months

3. ✘ 6 months

4. ✘ 12 months

Question Number : 200 Question Id : 5105297212 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The life of the winding rope is

Options :

1. ✘ 2 years

2. ✔ 3.5 years

3. ✘ 5 years

4. ✘ 6 years