

# Question Paper Preview

## 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 12th May 2025  
Shift1

**Subject Name :**

Mining Engineering

**Creation Date :**

2025-05-12 13:25:59

**Duration :**

180

**Total Marks :**

200

**Display Marks:**

No

**Share Answer Key With Delivery Engine :**

Yes

**Actual Answer Key :**

Yes

**Change Font Color :**

No

**Change Background Color :**

No

**Change Theme :**

No

**Help Button :**

No

**Show Reports :**

No

**Show Progress Bar :**

No

## MINING ENGINEERING

**Group Number :**

1

**Group Id :**

50696135

**Group Maximum Duration :**

0

**Group Minimum Duration :**

180

**Show Attended Group? :**

No

**Edit Attended Group? :**

No

**Break time :**

0

**Group Marks :**

200

## Mathematics

**Section Id :**

506961134

**Section Number :**

1

**Section type :**

Online

**Mandatory or Optional :**

Mandatory

|                                       |           |
|---------------------------------------|-----------|
| Number of Questions :                 | 50        |
| Number of Questions to be attempted : | 50        |
| Section Marks :                       | 50        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 506961155 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 1 Question Id : 5069616816 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$  and if  $(aI + bA)^2 = A$ , then  $b^4 =$

Options :

1. ✖ 1

2. ✖  $\frac{1}{2}$

3. ✖  $-\frac{1}{4}$

4. ✔  $\frac{1}{4}$

Question Number : 2 Question Id : 5069616817 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{pmatrix} \cos \theta & \sin \theta & 0 \\ -\sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{pmatrix} = F(\theta)$ , then  $A^{-1} =$

Options :

1. ✖  $F(\theta)$

2. ✓  $F(-\theta)$

3. ✗  $-F(\theta)$

4. ✗  $-F(-\theta)$

Question Number : 3 Question Id : 5069616818 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $(x, y, z)$  is the solution of linear equations  $x + y + z = 6$ ,

$x - y + z = 2$ ,  $2x + y - z = 1$ , then  $\frac{yz}{x} =$

Options :

1. ✗  $\frac{1}{6}$

2. ✗  $\frac{3}{2}$

3. ✓ 6

4. ✗ 3

Question Number : 4 Question Id : 5069616819 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If A and B are square matrices of order 3 with  $|A| = 2$ ,  $|B| = -4$ , then

$|2AB| =$

Options :

1. ✓ -64

2. ✖ 16

3. ✖ 64

4. ✖ -16

Question Number : 5 Question Id : 5069616820 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $\log_{\sqrt{27}}(x) = \frac{8}{3}$ , then  $x =$

Options :

1. ✖ 10

2. ✖ 16

3. ✔ 81

4. ✖ 27

Question Number : 6 Question Id : 5069616821 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $\frac{x^3}{(x-1)(x+2)} = Ax + B + \frac{C}{x-1} + \frac{D}{x+2}$ , then  $C + D =$

Options :

1. ✖ -3

2. ✔ 3

3. ✖ 2

4. ✖ 0

Question Number : 7 Question Id : 5069616822 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{\sin^2 33^\circ - \sin^2 57^\circ}{\sin 21^\circ - \cos 21^\circ} =$$

Options :

1. ✖  $\frac{\sqrt{3}}{2}$

2. ✖  $\frac{1}{2}$

3. ✔  $\frac{1}{\sqrt{2}}$

4. ✖ 1

Question Number : 8 Question Id : 5069616823 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\text{If } A + B = \frac{\pi}{3} \text{ and } \cos A + \cos B = 1, \text{ then } 3\cos(A - B) =$$

Options :

1. ✔ -1

2. ✖

2

3. ✖ -2

4. ✖ 1

Question Number : 9 Question Id : 5069616824 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $2 \tan^{-1} \left( \frac{2}{3} \right) = \tan^{-1}(k)$ , then  $k =$

Options :

1. ✖  $\frac{5}{12}$

2. ✖  $\frac{4}{3}$

3. ✔  $\frac{12}{5}$

4. ✖  $\frac{3}{4}$

Question Number : 10 Question Id : 5069616825 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\tan^{-1} \left( \frac{1-x}{1+x} \right) = \frac{1}{2} \tan^{-1}(x)$ ,  $x > 0$ , then  $x =$

Options :

1. ✖

$$\frac{\sqrt{3}}{2}$$

2. ✓  $\frac{1}{\sqrt{3}}$

3. ✗  $\frac{1}{2}$

4. ✗ 1

Question Number : 11 Question Id : 5069616826 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\cosh x = \frac{3}{2}$ , then  $\cosh 2x =$

Options :

1. ✗  $\frac{1}{3}$

2. ✓  $\frac{7}{2}$

3. ✗  $\frac{5}{2}$

4. ✗  $\frac{11}{3}$

Question Number : 12 Question Id : 5069616827 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\left(\frac{\sqrt{3}+i}{2}\right)^6 + \left(\frac{\sqrt{3}-i}{2}\right)^6 =$$

Options :

1. ✖ 3

2. ✖ -3

3. ✖ 2

4. ✔ -2

Question Number : 13 Question Id : 5069616828 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The distance between the lines  $y = 2x + 4$  and  $6x - 3y = 5$  is (in units)

Options :

1. ✖  $\frac{13}{2\sqrt{5}}$

2. ✔  $\frac{17}{3\sqrt{5}}$

3. ✖  $\frac{17}{2\sqrt{5}}$

4. ✖  $\frac{14}{3\sqrt{5}}$

Question Number : 14 Question Id : 5069616829 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If the radius of the circle  $x^2 + y^2 - 4x + 6y - k = 0$  is 4, then  $k =$

Options :

1. ✓ 3

2. ✗ -3

3. ✗ 2

4. ✗  $\frac{1}{2}$

Question Number : 15 Question Id : 5069616830 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If the angle between the lines  $3x - 4y + 1 = 0$  and  $ax + by - 7 = 0$  is  $90^\circ$ , then  $3a - 4b =$

Options :

1. ✗ 12

2. ✗ -1

3. ✓ 0

4. ✗

Question Number : 16 Question Id : 5069616831 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The equation of the tangent to the circle  $x^2 + y^2 - 6x + 4y - 12 = 0$  at  $(-1, 1)$  is

Options :

1. ✖  $4x + 3y + 1 = 0$

2. ✖  $2x - 3y + 5 = 0$

3. ✖  $2x + 3y - 1 = 0$

4. ✔  $4x - 3y + 7 = 0$

Question Number : 17 Question Id : 5069616832 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The eccentricity of the ellipse whose latus rectum is equal to half of its major axis is

Options :

1. ✖  $\sqrt{3}$

2. ✔  $\frac{1}{\sqrt{2}}$

3. ✖  $\sqrt{2}$

4. ✖  $\frac{1}{\sqrt{3}}$

Question Number : 18 Question Id : 5069616833 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \left( \sqrt{\sin(x^2)} \right) =$$

Options :

1. ✖  $\frac{x^2 \cos(x^2)}{\sqrt{\sin(x^2)}}$

2. ✖  $\frac{x \cos(x^2)}{2\sqrt{\sin(x^2)}}$

3. ✔  $\frac{x \cos(x^2)}{\sqrt{\sin(x^2)}}$

4. ✖  $\frac{x \sin(x^2)}{\sqrt{\cos(x^2)}}$

Question Number : 19 Question Id : 5069616834 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \tan^{-1} \left( \frac{\sin x}{1 + \cos x} \right) =$$

Options :

1. ✖ 2

2. ✖ 4

3. ✖ 1

4. ✔  $\frac{1}{2}$

Question Number : 20 Question Id : 5069616835 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✔  $\frac{y(\cos y - x \log y)}{x(x + y \sin y \log x)}$

2. ✖  $\frac{y(\cos y + x \log y)}{x(x + y \sin y \log x)}$

3. ✖  $\frac{y(\cos y - x \log y)}{x(x - y \sin y \log x)}$

4. ✖  $\frac{(\cos y - x \log y)}{(x + y \sin y \log x)}$

Question Number : 21 Question Id : 5069616836 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

$$\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$$

Options :

1. ✖  $\frac{1}{6}$

2. ✖  $\frac{2}{3}$

3. ✖  $\frac{3}{4}$

4. ✔  $\frac{5}{7}$

Question Number : 22 Question Id : 5069616837 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖  $x + 9y - 2 = 0$

2. ✖  $x + 9y - 22 = 0$

3. ✔  $x + 9y - 20 = 0$

4. ✖  $x + 9y - 12 = 0$

Question Number : 23 Question Id : 5069616838 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The maximum value of  $y = (x - 1)^2 e^x$  is

Options :

1. ✓  $\frac{4}{e}$

2. ✗  $\frac{2}{e}$

3. ✗  $\frac{1}{e}$

4. ✗  $\frac{9}{e}$

Question Number : 24 Question Id : 5069616839 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $f(x, y) = (x + y)e^{xy}$ , then at P(2,2) the value of  $\frac{\partial f}{\partial x} =$

Options :

1. ✗  $8e^4$

2. ✗  $4e^4$

3. ✓  $9e^4$

4. ✗  $16e^4$

Question Number : 25 Question Id : 5069616840 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $u(x, y) = \sin^{-1}\left(\frac{x^4 + y^4}{x^2 + y^2}\right)$ , then  $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} =$

Options :

1. ✖  $2 \cot u$

2. ✔  $2 \tan u$

3. ✖  $2 \sin u$

4. ✖  $2 \cos u$

Question Number : 26 Question Id : 5069616841 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$$\int \frac{1}{(1 - \cos x)} dx =$$

Options :

1. ✔  $-\cot x - \operatorname{cosec} x + c$

2. ✖  $-\cot x + \operatorname{cosec} x + c$

3. ✖  $\cot x - \operatorname{cosec} x + c$

4. ✖  $-\tan x - \sec x + c$

Question Number : 27 Question Id : 5069616842 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_2^4 f(x) dx =$$

Options :

1. ✖  $\int_2^4 f(6+x) dx$

2. ✖  $\int_2^4 f(4-x) dx$

3. ✖  $\int_2^4 f(2-x) dx$

4. ✔  $\int_2^4 f(6-x) dx$

Question Number : 28 Question Id : 5069616843 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_{-1}^1 \sin \pi x dx =$$

Options :

1. ✖  $\frac{1}{\pi}$

2. ✖  $\frac{2}{\pi}$

3. ✓ 0

4. ✗  $-\frac{2}{\pi}$

Question Number : 29 Question Id : 5069616844 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$$\lim_{n \rightarrow \infty} \left[ \frac{1}{n} + \frac{n^2}{(n+1)^3} + \frac{n^2}{(n+2)^3} + \dots + \frac{1}{8n} \right] =$$

Options :

1. ✗  $\frac{1}{8}$

2. ✗  $\frac{1}{4}$

3. ✓  $\frac{3}{8}$

4. ✗  $\frac{1}{2}$

Question Number : 30 Question Id : 5069616845 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The area of the region bounded by the lines  $x = 1, x = 4, y = 4x$  and  $y = x^2$  is

Options :

1. ✗ 2

2. ✖ 6

3. ✖ 16

4. ✔ 9

**Question Number : 31 Question Id : 5069616846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

According to Simpson's  $\frac{1}{3}$  rule, the value of the integral  $\int_1^3 \frac{1}{x} dx$  with  $h = \frac{1}{2}$ , is

**Options :**

1. ✖ 1.5

2. ✖ 0.5

3. ✔ 1.1

4. ✖ 2

**Question Number : 32 Question Id : 5069616847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The differential equation whose general solution is  $y = Ax^2 + Bx$ , where A and B are arbitrary constants is

**Options :**

1. ✖  $x^2 y'' + 2xy' - 2y = 0$

2. ✓  $x^2 y'' - 2xy' + 2y = 0$

3. ✗  $y'' - 2y' + 2y = 0$

4. ✗  $x^2 y'' - 2xy' - 2y = 0$

Question Number : 33 Question Id : 5069616848 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation  
 $(e^x + 1)y \, dy + (y + 1) \, dx = 0$  is

Options :

1. ✗  $e^{x-y} = c(y + 1)(1 - e^x)$

2. ✓  $e^{x+y} = c(y + 1)(1 + e^x)$

3. ✗  $e^{2x-y} = c(y + 1)(1 - e^x)$

4. ✗  $e^{x+y} = cy(1 + e^x)$

Question Number : 34 Question Id : 5069616849 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If the differential equation  $(x^2 + y^2)dx + kxy \, dy = 0$  is exact, then  $k =$

Options :

1. ✓ 2

2. ✖ 1

3. ✖ -1

4. ✖ -2

Question Number : 35 Question Id : 5069616850 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖  $y \cot x = \tan x + c$

2. ✖  $y \sec x = x \sin x + c$

3. ✖  $x \sec x = \sin x + c$

4. ✔  $y \sec x = \sin x + c$

Question Number : 36 Question Id : 5069616851 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The integrating factor of the differential equation  $\frac{dy}{dx} + \frac{2x}{x^2+1} y = x^2 + 1$  is

Options :

1. ✖  $2x$

2. ✖  $x^2 + 2$

3. ✔  $x^2 + 1$

4. ✖  $x^2 - 1$

Question Number : 37 Question Id : 5069616852 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The general solution of the differential equation  $6y'' - 5y' - 6y = 0$  is

Options :

1. ✖  $y = ae^{9x} + be^{4x}$

2. ✖  $y = ae^{-9x} + be^{-4x}$

3. ✔  $y = ae^{\frac{3x}{2}} + be^{\frac{-2x}{3}}$

4. ✖  $y = ae^{\frac{-3x}{2}} + be^{\frac{-2x}{3}}$

Question Number : 38 Question Id : 5069616853 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation  $(4D^2 + 4D - 3)y = e^{3x}$  is

(Here  $D \equiv \frac{d}{dx}$ )

Options :

1. ✖  $\frac{1}{11}e^{3x}$

2. ✓  $\frac{1}{45}e^{3x}$

3. ✗  $\frac{1}{5}e^{3x}$

4. ✗  $\frac{1}{3}e^{3x}$

Question Number : 39 Question Id : 5069616854 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particular integral of the differential equation

$$(D^2 + 4)y = 5(\cos 3x + \sin 3x) \text{ is}$$

$$\left( \text{Here } D \equiv \frac{d}{dx} \right)$$

Options :

1. ✗  $\cos 3x + \sin 3x$

2. ✗  $\cos 3x - \sin 3x$

3. ✓  $-\cos 3x - \sin 3x$

4. ✗  $\sin 3x - \cos 3x$

Question Number : 40 Question Id : 5069616855 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $L\left\{\int_0^t \cosh 3u \, du\right\} = f(s)$ , then  $f(4) =$

Options :

1. ✓  $\frac{1}{7}$

2. ✗  $\frac{1}{32}$

3. ✗ 0

4. ✗  $\frac{7}{32}$

Question Number : 41 Question Id : 5069616856 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Let  $F(t) = \begin{cases} e^{t-1}, & t > 1 \\ 0, & t < 1 \end{cases}$ . If  $s > 1$  then  $L\{F(t)\} =$

Options :

1. ✗  $\frac{1}{s-1}$

2. ✗  $\frac{e^{-1}}{s-1}$

3. ✓  $\frac{e^{-s}}{s-1}$

4. ✗

$$\frac{e^s}{s-1}$$

Question Number : 42 Question Id : 5069616857 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\infty} t e^{-t} \sin t \, dt =$$

Options :

1. ✖  $-1$

2. ✔  $\frac{1}{2}$

3. ✖  $0$

4. ✖  $2$

Question Number : 43 Question Id : 5069616858 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$L^{-1} \left\{ \frac{1}{s(s-1)} \right\} =$$

Options :

1. ✖  $1 - e^t$

2. ✖  $e^t + 1$

3. ✖

$$e^{-t} - 1$$

4. ✓  $e^t - 1$

Question Number : 44 Question Id : 5069616859 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

If  $L^{-1} \left\{ \frac{s+1}{s^2+2s+2} \right\} = e^{at} \cos bt$ , then  $a^2 + b^2 =$

Options :

1. ✓ 2

2. ✗ 4

3. ✗ 0

4. ✗ 8

Question Number : 45 Question Id : 5069616860 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

The convolution of the functions 1 and  $\sin t$  is

Options :

1. ✓  $1 - \cos t$

2. ✗  $1 - \sin t$

3. ✗

$\cos t$

4. ✖  $1 + \cos t$

Question Number : 46 Question Id : 5069616861 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The Laplace transform of the solution of the initial value problem

$y'' + 9y = 9u(t - 3), y(0) = 0, y'(0) = 0$  (Here  $u(t - 3)$  is the unit step function) is

Options :

1. ✖  $\frac{9e^{3s}}{s(s^2 - 9)}$

2. ✖  $\frac{e^{-3s}}{s^2(s^2 + 9)}$

3. ✖  $\frac{9e^{-3s}}{(s^2 + 9)^2}$

4. ✔  $\frac{9e^{-3s}}{s(s^2 + 9)}$

Question Number : 47 Question Id : 5069616862 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$$\int_{-\frac{\pi}{2}}^{\frac{3\pi}{2}} \cos^2 4x \, dx =$$

Options :

1. ✓  $\pi$

2. ✗  $3\pi$

3. ✗  $2\pi$

4. ✗  $\frac{\pi}{2}$

Question Number : 48 Question Id : 5069616863 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $a_3$  in the Fourier series expansion of the function

$$f(x) = \begin{cases} 0, & -\pi < x \leq 0 \\ x, & 0 < x \leq \pi \end{cases}$$

Options :

1. ✗  $\frac{-2}{\pi}$

2. ✗  $\frac{-2}{3\pi}$

3. ✗  $\frac{-2}{5\pi}$

4. ✓  $\frac{-2}{9\pi}$

Question Number : 49 Question Id : 5069616864 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The value of  $b_1$  in the Fourier series expansion of  $f(x) = x \sin x$  in  $0 \leq x \leq 2\pi$  is

Options :

1. ✓  $\pi$

2. ✗  $2\pi$

3. ✗  $3\pi$

4. ✗  $4\pi$

Question Number : 50 Question Id : 5069616865 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The period of the function  $f(x) = \sin\left(\frac{\pi x}{3}\right)$  is

Options :

1. ✗  $\pi$

2. ✗  $\frac{\pi}{3}$

3. ✖  $\frac{\pi}{6}$

4. ✔ 6

## Physics

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 506961135 |
| Section Number :                      | 2         |
| Section type :                        | Online    |
| Mandatory or Optional :               | Mandatory |
| Number of Questions :                 | 25        |
| Number of Questions to be attempted : | 25        |
| Section Marks :                       | 25        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 506961156 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 51 Question Id : 5069616866 Question Type : MCQ Option Shuffling : Yes  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

Velocity ( $v$ ) of water waves depends on their Wavelength ( $\lambda$ ), Density of Water ( $\rho$ ) and acceleration due to gravity ( $g$ ). By the method of dimensional analysis, the relation between these quantities is given by

Options :

1. ✖  $v^2$  is proportional to  $(\rho\lambda g)$

2. ✖  $v$  is proportional to  $\lambda g/\sqrt{\rho}$

3. ✔  $v^2$  is proportional to  $(\lambda g)$

4. ✖  $v$  is proportional to  $(\rho\lambda g)$

Question Number : 52 Question Id : 5069616867 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Force  $\vec{F} = 2\hat{i} + 3\hat{j} + 7\hat{k}$  newtons (N), acting on an object causes a displacement  $\vec{S} = 2\hat{i} + 3\hat{j} + 5\hat{k}$  meters (m). Then the work done is

Options :

1. ✖ 30 Nm

2. ✖ 40 Nm

3. ✔ 48 Nm

4. ✖ 25 Nm

Question Number : 53 Question Id : 5069616868 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\vec{A} = \hat{i} + 2\hat{j} + 3\hat{k}$  and  $\vec{B} = 3\hat{i} + 2\hat{j} + \hat{k}$  are the adjacent sides of a parallelogram respectively. The area of the Parallelogram is

Options :

1. ✖  $8\sqrt{2}$

2. ✔  $8\sqrt{3}$

3. ✖  $3\sqrt{8}$

4. ✖  $\sqrt{8}$

Question Number : 54 Question Id : 5069616869 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A block is placed on a rough floor and a horizontal force 'F' is applied on it. The force of friction 'f' by the floor on the block is measured for different values of 'F'. The graph between the 'f' and 'F' would be

Options :

1. ✖ The graph is a straight line of slope  $45^\circ$  for all 'F'
2. ✖ The graph is a straight line parallel to 'F' axis for all 'F'
3. ✔ The graph is a straight line of slope  $45^\circ$  for small values of 'F' and straight line parallel to 'F' axis for large 'F'
4. ✖ The graph is exponential with values of 'F'

Question Number : 55 Question Id : 5069616870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Throughout the flight of a particle in projectile motion

Options :

1. ✔ The horizontal component of velocity is constant
2. ✖ The vertical component of velocity is constant
3. ✖ The horizontal component of velocity decreases

The horizontal component of velocity is zero

4. ✖

Question Number : 56 Question Id : 5069616871 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A motor cyclist driving with a speed of 0.6 km/minute goes over a turn of radius of curvature 10 m. His slope with vertical in degrees (take  $g = 10 \text{ m/sec}^2$ ).

Options :

1. ✖  $0^\circ$

2. ✖  $30^\circ$

3. ✔  $45^\circ$

4. ✖  $60^\circ$

Question Number : 57 Question Id : 5069616872 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two wires of lengths in the ratio 2:3 taken from same material and having the same mass are stretched by same force. Then their elongations are in the ratio of

Options :

1. ✖ 2:3

2. ✖ 3:2

3. ✖ 1:2

4. ✔

Question Number : 58 Question Id : 5069616873 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following statements is wrong?

Options :

1. ✖ Surface Tension of a liquid decreases with increase of temperature
2. ✖ Surface Tension of a liquid increases or decreases depending on the type of impurities added to the liquid
3. ✔ Angle of Contact depends on the inclination of the solid rod placed in the liquid
4. ✖ A drop of oil placed on the surface of water will spread as a thin layer

Question Number : 59 Question Id : 5069616874 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A streamline flow is maintained across the two capillary tubes A and B connected in series. The length of B is twice that of A and the radius of B is half that of A. The pressure across A is P. The pressure across B is

Options :

1. ✖ 4P
2. ✖ 16P
3. ✔ 32P

4. ✖ P/32

**Question Number : 60 Question Id : 5069616875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A body of mass 0.1 kg is thrown vertically upward. At a certain point above the ground, the Potential energy and Kinetic energy of the body are 3.7 J and 6.3 J. The maximum height it reaches is ( $g=10\text{m/s}^2$ )

**Options :**

- 1. ✔ 10 m
- 2. ✖ 4 m
- 3. ✖ 100 m
- 4. ✖ 0.7 m

**Question Number : 61 Question Id : 5069616876 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Two containers of volumes  $20\text{m}^3$  and  $30\text{m}^3$  have gases at Pressures of 40 MPa and 50 MPa. The two containers are connected by a very narrow pipe of negligible volume and the gases are allowed to intermingle. If the temperature remains constant, the final pressure in MPa is

**Options :**

- 1. ✔ 46
- 2. ✖ 40
- 3. ✖ 50
- 4. ✖

Question Number : 62 Question Id : 5069616877 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

During an adiabatic process, a mono atomic gas at  $27^{\circ}\text{C}$  is compressed suddenly to  $1/8$  of its original volume. Then the Final temperature in  $^{\circ}\text{C}$  is (The ratio of the two specific heats of gases =  $5/3$ )

Options :

1. ✖ 1160

2. ✖ 887

3. ✔ 927

4. ✖ 88

Question Number : 63 Question Id : 5069616878 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The time period of a simple pendulum is 3 sec. Its length is made 4 times.  
Then its time period is

Options :

1. ✖ 3 sec

2. ✖ 4 sec

3. ✔ 6 sec

4. ✖ 1.5 sec

Question Number : 64 Question Id : 5069616879 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A particle executes Simple Harmonic Motion with an amplitude of 5 cm. When the particle is at 4 cm from the mean position, the magnitude of its velocity in SI units is equal to that of its acceleration. Then, its periodic time in seconds is

Options :

1. ✓  $8\pi/3$

2. ✗  $4\pi/3$

3. ✗  $3\pi/8$

4. ✗  $7\pi/3$

Question Number : 65 Question Id : 5069616880 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The two equations of Simple Harmonic Motions are  $Y_1 = 12 \sin(50t + \pi/2)$  and  $Y_2 = 12 \sin(50t + \pi/3)$ . The phase difference between two motions is

Options :

1. ✗  $\pi/2$

2. ✗  $\pi/3$

3. ✓  $\pi/6$

4. ✗  $\pi/8$

Question Number : 66 Question Id : 5069616881 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Multiple reflections leading to persistence of sound in an auditorium are

Options :

1. ✖ beats
2. ✖ echo
3. ✔ reverberation
4. ✖ stationary waves

Question Number : 67 Question Id : 5069616882 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Two sources  $S_1$  and  $S_2$  are moving with certain velocities. The apparent frequencies observed by a stationary observer are double and half of their original frequencies respectively. If the velocity of sound is  $v$  and velocity of wind is zero, then the velocities of two sources respectively are

Options :

1. ✖  $v/2$  and  $2v$
2. ✖  $v$  and  $v/2$
3. ✖  $3v/2$  and  $2v$
4. ✔  $v/2$  and  $v$

Question Number : 68 Question Id : 5069616883 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

**Correct Marks : 1 Wrong Marks : 0**

The Moment of couple acting on a bar magnet kept at an angle  $30^\circ$  to the direction of uniform magnetic field of induction 2 Tesla is equal to

**Options :**

1. ✖ Pole Strength of the Magnet
2. ✖ Length of the Magnet
3. ✖ Magnetic Flux
4. ✔ Magnetic Moment of the Magnet

**Question Number : 69 Question Id : 5069616884 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a Meter Bridge,  $R_1$  and  $R_2$  are the resistances connected in the left and right gaps respectively. The bridge is balanced at the balancing point of 60 cm from left. When a resistance of  $30\ \Omega$  is connected in parallel to  $R_2$ , the balancing point shifted to 90 cm. The values of  $R_1$  and  $R_2$  respectively are (in  $\Omega$ )

**Options :**

1. ✖ 30 and 50
2. ✖ 200 and 350
3. ✔ 225 and 150
4. ✖ 100 and 75

**Question Number : 70 Question Id : 5069616885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

When 220 V AC is applied across a step-up transformer, it draws a current of 3A in the secondary. If the number of turns in the primary coil of the transformer is 100 and that of secondary coil is 2000. The output power of the transformer is

**Options :**

1. ✖ 8800 W
2. ✔ 13200 W
3. ✖ 4400 W
4. ✖ 2200 W

**Question Number : 71 Question Id : 5069616886 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

A photon of frequency  $\nu$  is incident on a photosensitive metal surface whose threshold frequency is  $\nu_0$ . The kinetic energy of emitted photo electron is

**Options :**

1. ✖  $h^*\nu$
2. ✖  $h^*\nu_0$
3. ✔  $h^*(\nu - \nu_0)$
4. ✖  $h^*(\nu + \nu_0)$

**Question Number : 72 Question Id : 5069616887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In LASER, the condition of Population Inversion mean

**Options :**

1. ✖ The number of atoms in the lower energy state are more than the higher energy state
2. ✔ The number of atoms in the higher energy state are more than the lower energy state
3. ✖ The number of atoms in the lower and higher energy states are same
4. ✖ The number of atoms in higher energy state are zero

**Question Number : 73 Question Id : 5069616888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a Graded Index Optical Fibre

**Options :**

1. ✖ The Refractive Index of the core remains constant and will be greater than that of the cladding
2. ✖ The Refractive Index of the core remains constant and will be less than that of the cladding
3. ✖ The Refractive Indices of both core and cladding remain constant and are equal
4. ✔ The Refractive Index of the core varies with maximum at the centre and decreases as the radial distance increases from the axis of the core

**Question Number : 74 Question Id : 5069616889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements is correct, if  $n_e$  and  $n_h$  are the concentrations of the Electrons and Holes respectively

**Options :**

1. ✓ In an intrinsic semiconductor,  $n_e = n_h$  and both these charge carriers contribute to current equally
2. ✗ In p-type semiconductor,  $n_e > n_h$  and the current due to electrons is more than that of holes
3. ✗ In n-type semiconductor,  $n_p > n_e$  and current due to holes is more than that of electrons
4. ✗ In an extrinsic semiconductor,  $n_e = n_h$  and both these charge carriers contribute to current equally

**Question Number : 75 Question Id : 5069616890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The semiconductors used for fabrication of visible LEDs have band gap

**Options :**

1. ✗ Close to 1.5 eV
2. ✗ Close to 1.1 eV
3. ✗ About 1.0 eV to 1.6 eV
4. ✓ About 1.8 eV to 3 eV

# Chemistry

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 506961136 |
| Section Number :                      | 3         |
| Section type :                        | Online    |
| Mandatory or Optional :               | Mandatory |
| Number of Questions :                 | 25        |
| Number of Questions to be attempted : | 25        |
| Section Marks :                       | 25        |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 506961157 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 76 Question Id : 5069616891 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

According to Aufbau principle, which orbital is filled immediately after each of the 3p, 4p, 4f and 5d?

Options :

1. ✖ 3d, 5s, 5d, 6p

2. ✖ 3d, 4d, 5d, 6p

3. ✔ 4s, 5s, 5d, 6p

4. ✖ 4s, 5s, 5d, 7s

Question Number : 77 Question Id : 5069616892 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following properties is not due to hydrogen bonding.

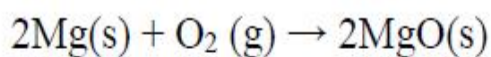
Options :

1. ✖

High boiling point of water

- 2. ✖ High viscosity of glycerol
- 3. ✖ Solubility of ammonia in water
- 4. ✔ Polar nature of halogen acid

Question Number : 78 Question Id : 5069616893 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0



In above reaction equation, the oxidation state of magnesium is changed from

Options :

- 1. ✔ 0 to +2
- 2. ✖ 0 to -2
- 3. ✖ +2 to -1
- 4. ✖ +2 to 0

Question Number : 79 Question Id : 5069616894 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

100 mL of ethanol, whose density is  $1.2 \text{ g.mL}^{-1}$  is diluted to 1.0 L by addition of distilled water. Molarity of the resultant solution is

**Options :**

1. ✖ 1.60

2. ✔ 2.60

3. ✖ 0.46

4. ✖ 2.90

**Question Number : 80 Question Id : 5069616895 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Among the below options, which is not a characteristic of a colloid

**Options :**

1. ✖ Particle size between  $10 \text{ \AA} - 1000 \text{ \AA}$

2. ✖ Heterogeneous

3. ✔ Can be separable by filtration

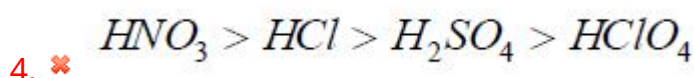
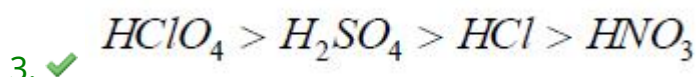
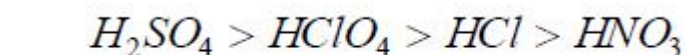
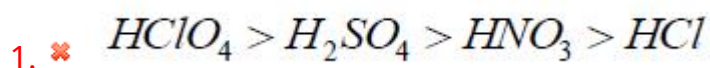
4. ✖ Diffuse slowly

**Question Number : 81 Question Id : 5069616896 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The correct order of decreasing strength of acids is

Options :



Question Number : 82 Question Id : 5069616897 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The solution which can resist change in its pH on the addition of an acid or a base is known as

Options :

1. ✖ Isotonic solution

2. ✖ Colloidal solution

3. ✖ Neutral solution

4. ✔ Buffer solution

Question Number : 83 Question Id : 5069616898 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The minimum level of a pollutant above which a healthy individual worker is adversely affected on exposure to it for eight hours in a day is called

**Options :**

1. ✖ Critical Limit Value
2. ✖ Toxic Limit Value
3. ✔ Threshold Limit Value
4. ✖ Dangerous Limit Value

**Question Number : 84 Question Id : 5069616899 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The consequences of global warming are:

- (A) Increase in average temperature of the earth
- (B) Melting of Himalayan glaciers
- (C) Increased Biochemical Oxygen Demand of natural water
- (D) Eutrophication of water bodies

Choose the correct option.

**Options :**

1. ✖ A, D
2. ✖ A, C
3. ✔ A, B
4. ✖ A, B, C

Question Number : 85 Question Id : 5069616900 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The chemicals used for defluoridation of water by Nalgonda Technique are

Options :

1. ✖ CaO and  $\text{CaOCl}_2$
2. ✔ Alum, CaO and  $\text{CaOCl}_2$
3. ✖  $\text{CaH}_2$ , NaOCl and Alum
4. ✖ NaOCl, NaH and Alum

Question Number : 86 Question Id : 5069616901 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process which removes non-ionic, ionic, colloidal and organic matter in water is

Options :

1. ✖ Ion exchange process
2. ✖ Lime soda process
3. ✔ Reverse osmosis process
4. ✖ Zeolite process

Question Number : 87 Question Id : 5069616902 Question Type : MCQ Option Shuffling : Yes

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The set of products that are formed during electrolysis of aqueous solution of KCl between platinum electrodes is

**Options :**

1. ✖ HCl and KOH
2. ✖ KOH and Cl<sub>2</sub>
3. ✔ KOH, Cl<sub>2</sub> and H<sub>2</sub>
4. ✖ K and Cl<sub>2</sub>

**Question Number : 88 Question Id : 5069616903 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

When same quantity of electricity is passed through aqueous AgNO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> solutions connected in series,  $5.04 \times 10^{-2}$  g of H<sub>2</sub> is liberated. What is the mass of silver (in grams) deposited?  
(Eq. Wt. of hydrogen and silver is 1.008 and 108 respectively)

**Options :**

1. ✖ 54
2. ✖ 0.54
3. ✔ 5.4
4. ✖ 10.8

Question Number : 89 Question Id : 5069616904 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Choose the correct option that differentiates metals from non-metals

Options :

Metals form acidic oxides, whereas non-metals form basic oxides.

1. ✖

Metals have a tendency to gain electrons, whereas non-metals have a tendency to lose electrons.

2. ✖

Metals are generally good conductors of electricity, whereas non-metals are insulators.

3. ✔

All metals exist in a solid state at room temperature.

4. ✖

Question Number : 90 Question Id : 5069616905 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Nichrome is commonly used in heating elements because

Options :

It has high electrical conductivity

1. ✖

It has a high melting point and corrosion resistance

2. ✔

It is lightweight

3. ✖

It is brittle and hard

4. ✖

Question Number : 91 Question Id : 5069616906 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ combinations is used for prevention of corrosion.

Options :

1. ✓ Phosphorous or Antimony
2. ✗ Phosphorous or Chlorine
3. ✗ Antimony or Nitrogen
4. ✗ Antimony or Sodium

Question Number : 92 Question Id : 5069616907 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The process of coating zinc metal over iron to improve corrosion resistance of iron is called

Options :

1. ✗ Electroplating
2. ✗ Annealing
3. ✓ Galvanizing
4. ✗ Tinning

Question Number : 93 Question Id : 5069616908 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is a cross linked polymer.

Options :

1. ✓ Bakelite
2. ✗ LDPE
3. ✗ Polystyrene
4. ✗ PVC

Question Number : 94 Question Id : 5069616909 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the Biodegradable polymers from the following and choose the correct option.

(I) PVC      (II) PHBV      (III) Polypropylene      (IV) Nylon-2-nylon-6

Options :

1. ✗ I and II
2. ✓ II and IV
3. ✗ I and IV
4. ✗ I, II and III

Question Number : 95 Question Id : 5069616910 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Calculate the amount of oxygen required for the complete combustion of 1 mole of Methane ( $\text{CH}_4$ ).

Options :

1. ✖ 1 mole
2. ✔ 2 moles
3. ✖ 3 moles
4. ✖ 4 moles

Question Number : 96 Question Id : 5069616911 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ represents the composition of water gas

Options :

1. ✔  $\text{CO} + \text{H}_2$
2. ✖  $\text{CO}_2 + \text{H}_2$
3. ✖  $\text{CO} + \text{CH}_4$
4. ✖  $\text{CO}_2 + \text{CH}_4$

Question Number : 97 Question Id : 5069616912 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following and choose the correct option.

**List – I**

**List – II**

- |                                |                                                                            |
|--------------------------------|----------------------------------------------------------------------------|
| a) Hydrogen electrode          | (i) $\text{Pt} \mid \text{Fe}^{3+}, \text{Fe}^{2+}$                        |
| b) Standard hydrogen electrode | (ii) $\text{Fe} \mid \text{Fe}^{2+}$                                       |
| c) Metal-metal ion electrode   | (iii) pH measurement                                                       |
| d) Glass electrode             | (iv) $\text{Pt}, \text{H}_2 (2 \text{ bar}) \mid \text{H}^+ (0.1\text{M})$ |
|                                | (v) $\text{Pt}, \text{H}_2 (1 \text{ bar}) \mid \text{H}^+ (1.0\text{M})$  |
|                                | (vi) Oxidation electrode                                                   |

**Options :**

1. ✖ a – iii, b – v, c – i, d – vi

2. ✖ a – v, b – iv, c – ii, d – iii

3. ✖ a – v, b – iii, c – i, d – vi

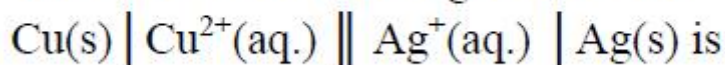
4. ✔ a – iv, b – v, c – ii, d – iii

**Question Number : 98 Question Id : 5069616913 Question Type : MCQ Option Shuffling : Yes**

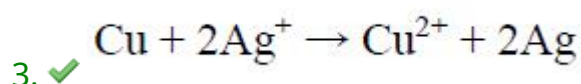
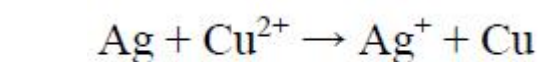
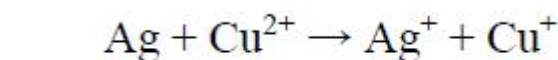
**Display Question Number : Yes**

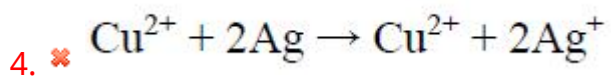
**Correct Marks : 1 Wrong Marks : 0**

The cell reaction of the galvanic cell



**Options :**





Question Number : 99 Question Id : 5069616914 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

\_\_\_\_\_ is used to reduce water pollution.

Options :

- 1. ✖ Neem
- 2. ✖ Watermelon
- 3. ✔ Water hyacinth
- 4. ✖ People

Question Number : 100 Question Id : 5069616915 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following can cause soil pollution

Options :

- 1. ✔ DDT
- 2. ✖  $\text{CO}_2$
- 3. ✖  $\text{NO}_2$
- 4. ✖ Nitrogen

# MINING ENGINEERING

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 506961137 |
| Section Number :                      | 4         |
| Section type :                        | Online    |
| Mandatory or Optional :               | Mandatory |
| Number of Questions :                 | 100       |
| Number of Questions to be attempted : | 100       |
| Section Marks :                       | 100       |
| Maximum Instruction Time :            | 0         |
| Sub-Section Number :                  | 1         |
| Sub-Section Id :                      | 506961158 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 101 Question Id : 5069616916 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A roadway driven through stone to interconnect two or more seams is known as

Options :

1. ✘ Cross cut
2. ✔ Cross measure drift
3. ✘ Level roadway
4. ✘ Raise

Question Number : 102 Question Id : 5069616917 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The method of mining used for the extraction of minerals below the sea

Options :

1. ✘ Leaching
2. ✘

Placer mining

3. ✓ Dredging

4. ✗ Deep sea Mining

**Question Number : 103 Question Id : 5069616918 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The method shaft sinking used to sink through loose deposit of sand, mud or alluvium near surface is \_\_\_\_

**Options :**

1. ✓ Piling method

2. ✗ Open Caisson

3. ✗ Pneumatic Caisson

4. ✗ Cementation method

**Question Number : 104 Question Id : 5069616919 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The device used to prevent undue swinging of the bucket in sinking shaft is

**Options :**

1. ✗ Spider

2. ✗ Kibble

3. ✗ Scaffold

4. ✓ Rider

**Question Number : 105 Question Id : 5069616920 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The property of an explosive which will not allow to change its performance after storage in magazine

**Options :**

1. ✗ Density
2. ✓ Stability
3. ✗ Water resistance
4. ✗ Sensitivity

**Question Number : 106 Question Id : 5069616921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a blasting pattern the holes which are responsible to get required shape of the roadway is

**Options :**

1. ✗ Cut hole
2. ✗ Sumpers
3. ✓ Trimmers
4. ✗ Easers

Question Number : 107 Question Id : 5069616922 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The operation of tracing the broken and lost parts in the hole and withdrawing them to the surface is known as

Options :

1. ✖ Lining of borehole
2. ✖ Bore hole survey
3. ✖ Flushing of bore hole
4. ✔ Fishing of bore hole

Question Number : 108 Question Id : 5069616923 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

To recover the core, the type of drilling used is

Options :

1. ✖ Percussive drilling
2. ✖ Rotary drilling with Tri-cone roller bit
3. ✔ Rotary drilling with Diamond bit
4. ✖ Churn drilling

Question Number : 109 Question Id : 5069616924 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the percentage of CO in a mine air is 0.02. Then corresponding  
Physiological effect is

**Options :**

1. ✓ Headache, discomfort
2. ✗ Palpitation after 10 minutes at work
3. ✗ Unconsciousness after 10 minutes at work
4. ✗ Palpitation after 30 minutes at rest

**Question Number : 110 Question Id : 5069616925 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The percentage of O<sub>2</sub> by volume in the intake air of mine is

**Options :**

1. ✗ 23.15
2. ✗ 20.28
3. ✗ 22.05
4. ✓ 20.93

**Question Number : 111 Question Id : 5069616926 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Deposit that are transported by wind are known as

**Options :**

1. ✗ Fluvatile
2. ✗ Glacial
3. ✓ Aeolian

4. ✖ Estuarine

Question Number : 112 Question Id : 5069616927 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following mineral has high specific gravity?

Options :

1. ✖ Quartz

2. ✔ Barites

3. ✖ Gypsum

4. ✖ Talc

Question Number : 113 Question Id : 5069616928 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Lime stone is a type of

Options :

1. ✔ Sedimentary rock

2. ✖ Igneous rock

3. ✖ Metamorphic rock

4. ✖ Marble rock

Question Number : 114 Question Id : 5069616929 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The reverse fault is usually caused by

**Options :**

1. ✓ Horizontal thrust
2. ✗ Vertical thrust
3. ✗ Both horizontal and vertical thrust
4. ✗ Inclined thrust

**Question Number : 115 Question Id : 5069616930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

If sandstone is the original rock then what is its metamorphic rock?

**Options :**

1. ✗ Slate
2. ✗ Gneiss
3. ✓ Quartzite
4. ✗ Marble

**Question Number : 116 Question Id : 5069616931 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

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

**Options :**

1. ✗ Fault
2. ✗ Fold
3. ✓ Outcrop

4. ✖ Dyke

Question Number : 117 Question Id : 5069616932 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The crest of fold where strata are bent up to form an arch is called

Options :

1. ✖ Syncline

2. ✔ Anticline

3. ✖ Outlier

4. ✖ Swilley

Question Number : 118 Question Id : 5069616933 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The horizontal component of the apparent displacement measured along the direction of dip of the fault is

Options :

1. ✖ Throw of fault

2. ✔ Heave of fault

3. ✖ Hade of fault

4. ✖ Horsts

Question Number : 119 Question Id : 5069616934 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The branch of Geology that deals principally with the mode of occurrence, origin, distribution, classification and association of all minerals and rocks of economic importance is called

**Options :**

1. ✖ Engineering geology
2. ✖ Structural geology
3. ✖ Mineralogy
4. ✔ Economic geology

**Question Number : 120 Question Id : 5069616935 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Identify the correct sequence of Moh's scale of hardness

**Options :**

1. ✔ Talk – Calcite – Apatite – Quartz – Corundum
2. ✖ Talk – Calcite – Quartz – Apatite – Corundum
3. ✖ Talk – Calcite – Gypsum - Apatite – Quartz – Corundum
4. ✖ Talk – Calcite – Apatite – Gypsum – Quartz – Corundum

**Question Number : 121 Question Id : 5069616936 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The shape of the pillar used for adoption of high-capacity machinery like shuttle cars and locomotive is

**Options :**

1. ✖ Rectangle

2. ✖ Square

3. ✔ Rhombus

4. ✖ Circle

**Question Number : 122 Question Id : 5069616937 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The pillars formed during development are split into small pillars called

**Options :**

1. ✔ Stook

2. ✖ Slice

3. ✖ Splits

4. ✖ Rib pillar

**Question Number : 123 Question Id : 5069616938 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In Bord and Pillar development the Center-to-Center distance of the pillars developed is 40 m x 40 m. The width of the roadway developed is 4.2 m. The area of overlying roof supported by the pillar in Tributary area method is

**Options :**

1. ✖ 1500 m<sup>2</sup>

2. ✔ 1600 m<sup>2</sup>

3. ✖ 2000 m<sup>2</sup>

4. ✖ 2500 m<sup>2</sup>

**Question Number : 124 Question Id : 5069616939 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a Longwall retreating method, face length of the longwall panel developed is 200 m. The thickness of the seam is 3 m and the width of the panel cut by the shearer is 1 m. The number of cuts performed by the shearer in a shift of 8 hours is 3. The unit weight of coal is 1.5 t / m<sup>3</sup>. The production per shift is

**Options :**

1. ✖ 1500 t / shift

2. ✖ 2000 t / shift

3. ✖ 2500 t / shift

4. ✔ 2700 t / shift

**Question Number : 125 Question Id : 5069616940 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The sudden release of elastic strain energy stored in the coal pillars, resulting in a violent burst of coal, is called

**Options :**

1. ✖ Air blast

2. ✖ Rock burst

3. ✔ Coal bump

4. ✖ Main fall

**Question Number : 126 Question Id : 5069616941 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The percentage of extraction of coal from a pillar of 30m x 30 m centre to centre with roadways 4m wide is

**Options :**

1. ✖ 22

2. ✔ 25

3. ✖ 28

4. ✖ 30

**Question Number : 127 Question Id : 5069616942 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In longwall advancing, the gate roads extend slightly beyond the face and the extended portion of the gate road is called

**Options :**

1. ✔ Stable

2. ✖ Buttok

3. ✖ Packwall

4. ✖ Tailgate

**Question Number : 128 Question Id : 5069616943 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In which line of extraction, the pillar or stook is under excessive pressure and is liable to crush

**Options :**

1. ✘ Diagonal
2. ✘ Step Diagonal
3. ✘ Parallel to strike
4. ✔ Arrow head

**Question Number : 129 Question Id : 5069616944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In the case of contiguous coal seams, the partition between the two seams is less than

**Options :**

1. ✔ 9 m
2. ✘ 10 m
3. ✘ 15 m
4. ✘ 20 m

**Question Number : 130 Question Id : 5069616945 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The following are the Geo mining conditions of a Coal deposit.

- Thickness of the seam is 4 m
- Flat deposit
- Proposed highly mechanized mining with high production

The suitable method of mining is

**Options :**

1. ✖ Bord and Pillar method
2. ✔ Longwall Mining
3. ✖ Room and pillar method
4. ✖ Blasting gallery method

**Question Number : 131 Question Id : 5069616946 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In which method of Mining, coal is converted into gas inside the coal seam itself

**Options :**

1. ✖ Hydraulic mining
2. ✖ Blasting gallery method
3. ✔ Gasification of coal
4. ✖ Horizon mining

**Question Number : 132 Question Id : 5069616947 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following factor is taken into consideration in Panel system of extraction in order to decide the size of the panel

**Options :**

1. ✖ Output required
2. ✖ Depth of the deposit

3. ✓ Incubation period
4. ✗ Thickness of the seam

**Question Number : 133 Question Id : 5069616948 Question Type : MCQ Option Shuffling : Yes**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

The maximum permissible gradient for haul road in opencast mines is

**Options :**

1. ✗  $12^0$
2. ✗  $13^0$
3. ✓  $14^0$
4. ✗  $15^0$

**Question Number : 134 Question Id : 5069616949 Question Type : MCQ Option Shuffling : Yes**  
**Display Question Number : Yes**  
**Correct Marks : 1 Wrong Marks : 0**

In case of an OC mine, if the pit wall is too steep to allow suitable bends the layout of haul road geometry selected should be

**Options :**

1. ✗ Switch back
2. ✓ Spiral
3. ✗ Zigzag
4. ✗ Switch front

**Question Number : 135 Question Id : 5069616950 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

To open a mine for deep-seated minerals, the type of cut used is

**Options :**

1. ✓ Internal box cut
2. ✗ External box cut
3. ✗ Trench
4. ✗ Deep cut

**Question Number : 136 Question Id : 5069616951 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the most suitable machine for ripping soft and medium-hard rocks below hardness 5 on Mohr's scale that are laminated and stratified?

**Options :**

1. ✗ Dozer
2. ✗ Scraper
3. ✓ Ripper
4. ✗ Shovel

**Question Number : 137 Question Id : 5069616952 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The machine employed for loading fragmented rock from a bench standing on the floor of the bench is

**Options :**

1. ✗ Tractor shovel

2. ✖ Bucket Wheel Excavator

3. ✖ Surface miner

4. ✔ Dipper shovel

Question Number : 138 Question Id : 5069616953 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Terrace cut is given with the help of?

Options :

1. ✖ Scraper

2. ✔ Bucket Wheel Excavator

3. ✖ Ripper

4. ✖ Continuous miner

Question Number : 139 Question Id : 5069616954 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT a method of dragline working

Options :

1. ✖ Simple side casting

2. ✖ Extended bench casting

3. ✖ Tandem method of casting

4. ✔

## Windrow – continuous method

Question Number : 140 Question Id : 5069616955 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The common mode of failure of overburden dump benches is

Options :

1. ✖ Planar failure
2. ✔ Circular failure
3. ✖ Wedge failure
4. ✖ Toppling failure

Question Number : 141 Question Id : 5069616956 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following equipment is used for selective mining in opencast mines

Options :

1. ✖ Dragline
2. ✖ Dipper shovel
3. ✔ Hydraulic Shovel
4. ✖ Ripper

Question Number : 142 Question Id : 5069616957 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

**Correct Marks : 1 Wrong Marks : 0**

Which one of the following term is not related to opencast mining

**Options :**

1. ✖ Boxcut
2. ✖ Highwall
3. ✖ Crest
4. ✔ Winze

**Question Number : 143 Question Id : 5069616958 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In opencast blasting, purpose of sub-grade drilling is to

**Options :**

1. ✔ Avoid formation of toe
2. ✖ Reduce ground vibrations
3. ✖ Reduce consumption of explosives
4. ✖ Reduce flyrock

**Question Number : 144 Question Id : 5069616959 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

For O.B removal with shovel - dumper combination, the optimum size of the dumper depends on

**Options :**

1. ✔ Distance of the haul and size of the shovel
2. ✖

Gradient of haul road

- 3. ✖ Economic mining operations
- 4. ✖ Targeted production to be handled

**Question Number : 145 Question Id : 5069616960 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

On a principal plane, the value of Shear stress is

**Options :**

- 1. ✖ Maximum
- 2. ✖ Minimum
- 3. ✖ Neither maximum nor minimum
- 4. ✔ Zero

**Question Number : 146 Question Id : 5069616961 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT a parameter of Q-system of rock mass classification

**Options :**

- 1. ✖ Joint set number
- 2. ✔ Joint orientation
- 3. ✖ Joint roughness number
- 4. ✖ Joint alteration number

Question Number : 147 Question Id : 5069616962 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The % RQD of a mine is 79. Then the corresponding classification is

Options :

1. ✓ Good
2. ✗ Fair
3. ✗ Moderate
4. ✗ Poor

Question Number : 148 Question Id : 5069616963 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The instrument used to measure the convergence of roof at a remote location of an underground mine is

Options :

1. ✗ Tell-tale bore hole extensometer
2. ✓ Remote convergence recorder
3. ✗ Load cells
4. ✗ Borehole deformation gauge

Question Number : 149 Question Id : 5069616964 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The type of subsidence in which maximum subsidence occurs over an area

**Options :**

1. ✖ Sub-Critical width of extraction
2. ✖ Critical width of extraction
3. ✔ Super Critical width of extraction
4. ✖ Normal width of extraction

**Question Number : 150 Question Id : 5069616965 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is “Stress restoration method” of in-situ stress measurement

**Options :**

1. ✖ Bore hole deformation gauge with over coring technique
2. ✔ Flat jack method
3. ✖ Hydraulic fracture method
4. ✖ Stress burst method

**Question Number : 151 Question Id : 5069616966 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is an example of passive support

**Options :**

1. ✖ Friction prop
2. ✖ Hydraulic prop

3. ✖ Wooden prop

4. ✔ Fully grouted roof bolt

**Question Number : 152 Question Id : 5069616967 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

What is the mining equipment used for the withdrawal of supports in a depillaring area

**Options :**

1. ✔ Sylvester prop with drawer

2. ✖ Hydraulic prop with drawer

3. ✖ Pull chain prop with drawer

4. ✖ Stop block prop with drawer

**Question Number : 153 Question Id : 5069616968 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

If the roadway is used for the frequent movement of machinery, the type of supporting system preferred is

**Options :**

1. ✖ Wooden props

2. ✖ Chocks

3. ✔ Roof bolts

4. ✖

## Hydraulic props

Question Number : 154 Question Id : 5069616969 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The values of major and minor principal stresses of a Mohr's circle are 9 Mpa, 3 Mpa respectively. The value of radius of Mohr's circle is \_\_\_\_\_

Options :

1. ✖ 6 Mpa
2. ✔ 3 Mpa
3. ✖ 5 Mpa
4. ✖ 9 Mpa

Question Number : 155 Question Id : 5069616970 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following Prop is also known as yield prop

Options :

1. ✔ Friction prop
2. ✖ Steel prop
3. ✖ Wooden prop
4. ✖ Normal prop

Question Number : 156 Question Id : 5069616971 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

**Correct Marks : 1 Wrong Marks : 0**

If the void ratio of the rock sample is 0.6 then the value of porosity is

**Options :**

1. ✖ 0.625

2. ✔ 0.375

3. ✖ 0.425

4. ✖ 0.575

**Question Number : 157 Question Id : 5069616972 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The type of rope used for winding is

**Options :**

1. ✔ Lang's lay type

2. ✖ Ordinary lay type

3. ✖ Full locked coil rope

4. ✖ Half locked coil

**Question Number : 158 Question Id : 5069616973 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Clifton pulley is used in

**Options :**

1. ✖ Direct rope haulage

2. ✔ Endless rope haulage

3. ✖ Gravity haulage

4. ✖ Main and tail rope haulage

Question Number : 159 Question Id : 5069616974 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Jig pulley is used in

Options :

1. ✖ Direct rope haulage

2. ✖ Endless rope haulage

3. ✔ Gravity haulage

4. ✖ Main and tail rope haulage

Question Number : 160 Question Id : 5069616975 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In koepe winding the over wind is prevented by

Options :

1. ✖ Safety hook

2. ✖ Safety catches

3. ✖ Breakage of rope

4. ✔ Convergence of guides

Question Number : 161 Question Id : 5069616976 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Function of the snub pulley in the belt conveyor system is

Options :

1. ✖ Cleaning device
2. ✖ Safety device
3. ✖ Braking device
4. ✔ Increasing the angle of wrap

Question Number : 162 Question Id : 5069616977 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Function of the rotary brush in the belt conveyor system is

Options :

1. ✔ Cleaning device
2. ✖ Safety device
3. ✖ Braking device
4. ✖ Increasing the angle of wrap

Question Number : 163 Question Id : 5069616978 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Function of the pull cord in the belt conveyor system is

Options :

1. ✖

Cleaning device

- 2. ✓ Safety stopping device
- 3. ✗ Braking device
- 4. ✗ Increasing the angle of wrap

**Question Number : 164 Question Id : 5069616979 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Cawl is the component of

**Options :**

- 1. ✗ Road header
- 2. ✗ AFC
- 3. ✓ DERDS
- 4. ✗ Shield support

**Question Number : 165 Question Id : 5069616980 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Flight bar is a component of

**Options :**

- 1. ✗ Road header
- 2. ✗ Shield support
- 3. ✗ DERDS

4. ✓ AFC

Question Number : 166 Question Id : 5069616981 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the correct sequence of attachment between the winding rope and the cage

Options :

1. ✗ Bull chains, triangular plate, capel, detaching hook
2. ✗ Triangular plate, detaching hook, bull chains, capel
3. ✓ Capel, detaching hook, triangular plate, bull chain
4. ✗ Triangular plate, capel, detaching hook, bull chain

Question Number : 167 Question Id : 5069616982 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a turbine pump, end thrust is balanced by \_\_\_\_\_

Options :

1. ✗ Pressure gauge
2. ✓ Balancing disc
3. ✗ Retaining valve
4. ✗ Foot valve

Question Number : 168 Question Id : 5069616983 Question Type : MCQ Option Shuffling : Yes

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The purpose of Laminscate link in a chock shield support is

**Options :**

1. ✖ To protect workings from goaf area
2. ✖ To bear the load of overlying strata acting on the face
3. ✔ To adjust the height of power support based on thickness of the seam
4. ✖ To support freshly exposed roof

**Question Number : 169 Question Id : 5069616984 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a linear measurement the line which is measured to locate the internal details and to avoid long off sets is

**Options :**

1. ✖ Base line
2. ✖ Offset
3. ✖ Check line
4. ✔ Tie line

**Question Number : 170 Question Id : 5069616985 Question Type : MCQ Option Shuffling : Yes**

**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The area of a surface measured on a plan is  $30 \text{ cm}^2$ , drawn to a scale of  $1 \text{ cm} = 10\text{m}$ . The corresponding area measured on the ground is

**Options :**

1. ✖  $2000 \text{ m}^2$
2. ✔  $3000 \text{ m}^2$
3. ✖  $1500 \text{ m}^2$
4. ✖  $4000 \text{ m}^2$

**Question Number : 171 Question Id : 5069616986 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The Quadrantal Bearing (QB) of a line is  $N 30^\circ W$  then corresponding Whole Circle Bearing (WCB) is

**Options :**

1. ✔  $330^\circ$
2. ✖  $30^\circ$
3. ✖  $210^\circ$
4. ✖  $150^\circ$

**Question Number : 172 Question Id : 5069616987 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The bearing of a line is  $N 56^\circ 20' 45'' E$  and the declination of the area is  $1^\circ 20' W$ . The direction of true north is

**Options :**

1. ✖  $57^\circ 40' 45''$
2. ✖

$55^{\circ} 00' 25''$

3. ✓  $55^{\circ} 00' 45''$

4. ✗  $57^{\circ} 20' 45''$

**Question Number : 173 Question Id : 5069616988 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

For a closed traverse of sides ABCDEF, the sum of interior angles of the traverse is

**Options :**

1. ✗  $630^{\circ}$

2. ✗  $540^{\circ}$

3. ✗  $450^{\circ}$

4. ✓  $720^{\circ}$

**Question Number : 174 Question Id : 5069616989 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In a theodolite survey, the process of rotation of telescope about vertical axis in a horizontal plane is known as

**Options :**

1. ✓ Swinging

2. ✗ Transiting

3. ✗ Reversing

4. ✖ Plunging

Question Number : 175 Question Id : 5069616990 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a theodolite traversing, which of the following method is most commonly used for balancing the traverse

Options :

1. ✖ Transit rule

2. ✔ Bowditch rule

3. ✖ Axis method

4. ✖ Graphical method

Question Number : 176 Question Id : 5069616991 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a simple curve the length of the long chord is equal to the radius  $R$  of the curve. Then angle made by the curve at its centre is

Options :

1. ✖  $30^\circ$

2. ✔  $60^\circ$

3. ✖  $90^\circ$

4. ✖  $120^\circ$

Question Number : 177 Question Id : 5069616992 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

In a level survey, the formula for correction for refraction is

Options :

1. ✖  $+ 0.0785 D^2$
2. ✖  $- 0.0785 D^2$
3. ✔  $+ 0.0112 D^2$
4. ✖  $- 0.0112 D^2$

Question Number : 178 Question Id : 5069616993 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The relation between true dip ( $\alpha$ ) and apparent dip ( $\beta$ ) given the angle between them is  $\emptyset$

Options :

1. ✔  $\tan (\beta) = \tan (\alpha) \times \cos (\emptyset)$
2. ✖  $\tan (\alpha) = \tan (\beta) \times \cos (\emptyset)$
3. ✖  $\cos (\beta) = \cos (\alpha) \times \tan (\emptyset)$
4. ✖  $\cos (\alpha) = \cos (\beta) \times \tan (\emptyset)$

Question Number : 179 Question Id : 5069616994 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The minimum number of satellite signals required for accurate location of surveying station using GPS

**Options :**

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 6

**Question Number : 180 Question Id : 5069616995 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The method of correlation where the theodolite is set in exact alignment of plumb plane in a shaft is known as

**Options :**

1. ✖ Direct method of correlation

2. ✔ Co-Planation method

3. ✖ Weiss batch triangle method

4. ✖ Weiss quadrilateral method

**Question Number : 181 Question Id : 5069616996 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

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

**Options :**

1. ✖ Open stoping
2. ✖ Shrikage stoping
3. ✖ Cut and fill stoping
4. ✔ Sub-level stoping

Question Number : 182 Question Id : 5069616997 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The pillar left to support the upper level is called?

Options :

1. ✖ Sill pillar
2. ✖ Rib pillar
3. ✔ Crown pillar
4. ✖ Protective pillar

Question Number : 183 Question Id : 5069616998 Question Type : MCQ Option Shuffling : Yes  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Application of cut and fill mining is

Options :

1. ✔ Steeply dipping with reasonable strong ore with small or large irregular bodies
2. ✖ Steeply dipping with soft ore with regular bodies

Shallow dipping with reasonable strong ore with small or large  
3. ✖ regular bodies

Narrow dipping with reasonable strong ore with small or large  
4. ✖ irregular bodies

**Question Number : 184 Question Id : 5069616999 Question Type : MCQ Option Shuffling : Yes**  
**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The stoping method of mining in which sides are very weak and are supported by regular frame set is known as

**Options :**

1. ✖ Cut and fill

2. ✔ Square set

3. ✖ Shrinkage

4. ✖ Sub-level

**Question Number : 185 Question Id : 5069617000 Question Type : MCQ Option Shuffling : Yes**  
**Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Alamak raise climber can be used only where inclination of the raise from horizontal is

**Options :**

1. ✔ 40 degrees

2. ✖ 30 degrees

3. ✖ 20 degrees

4. ✖ 10 degrees

**Question Number : 186 Question Id : 5069617001 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The most common method of raising adopted in majority of metal mines is

**Options :**

1. ✖ Drop raise

2. ✖ Long hole drilling

3. ✔ Open raising

4. ✖ Compartment revising

**Question Number : 187 Question Id : 5069617002 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

In metal mines a shaft is always sunk in

**Options :**

1. ✖ Across the deposit

2. ✔ Foot wall

3. ✖ Hanging wall

4. ✖ The mineral deposit

**Question Number : 188 Question Id : 5069617003 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The roadways driven from the shaft from different horizons for access to the mineral deposit are?

**Options :**

1. ✖ Inclines
2. ✖ Raises
3. ✖ Winzes
4. ✔ Drifts

**Question Number : 189 Question Id : 5069617004 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Rill stoping method is also known as

**Options :**

1. ✔ Over hand stoping
2. ✖ Under hand stoping
3. ✖ Breast stoping
4. ✖ Room and Pillar stoping

**Question Number : 190 Question Id : 5069617005 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The method of stoping best suited to low grade deposits of horizontal or mild dip and of thickness upto 5m is

**Options :**

1. ✖ Shrikage stoping

2. ✖ Sublevel stoping

3. ✔ Breast stoping

4. ✖ Open stoping

**Question Number : 191 Question Id : 5069617006 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Given the following information related to Natural Ventilation Pressure.

$T_u$  – Absolute temperature of upcast shaft,

$T_d$  – Absolute temperature of downcast shaft

D – Depth of the shaft

The formula for motive column is

**Options :**

1. ✔  $\left[ \frac{T_u - T_d}{T_u} \right] \times D$

2. ✖  $\left[ \frac{T_u + T_d}{T_u} \right] \times D$

3. ✖  $\left[ \frac{T_u - T_d}{T_d} \right] \times D$

4. ✖  $\left[ \frac{T_u + T_d}{T_d} \right] \times D$

**Question Number : 192 Question Id : 5069617007 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

If the speed of a centrifugal fan is increased by 2 times. Then the corresponding power consumption of fan is

**Options :**

1. ✖ Increases by 2 times
2. ✖ Increases by 4 times
3. ✔ Increases by 8 times
4. ✖ Increases by 9 times

**Question Number : 193 Question Id : 5069617008 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following Mine explosion is associated with backlash

**Options :**

1. ✔ Fire damp explosion
2. ✖ Coal dust explosion
3. ✖ Spontaneous heating of coal
4. ✖ Black damp explosion

**Question Number : 194 Question Id : 5069617009 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following centrifugal fan is used in mines having non overloading power characteristics

**Options :**

1. ✖

Forward bladed centrifugal fan

- 2. ✖ Radial bladed centrifugal fan
- 3. ✖ Axial bladed centrifugal fan
- 4. ✔ Backward bladed centrifugal fan

Question Number : 195 Question Id : 5069617010 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of CO / O<sub>2</sub> deficiency ratio of 2% in a mine indicates

Options :

- 1. ✖ Normal condition
- 2. ✖ Existence of spontaneous heating
- 3. ✔ Heating in advance stage
- 4. ✖ Active fire

Question Number : 196 Question Id : 5069617011 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following is NOT a property of Incombustible matter in Stone dust barriers

Options :

- 1. ✔ Shall cake
- 2. ✖ Shall not contains more than 5% free silica

3. ✖ Easily dispersible in air

4. ✖ Light in color

**Question Number : 197 Question Id : 5069617012 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

The apparatus used to administer pure oxygen to an unconscious person or a person effected by noxious gasses is

**Options :**

1. ✖ Smoke helmet

2. ✖ SCBA

3. ✖ Self-Rescuer

4. ✔ Reviving apparatus

**Question Number : 198 Question Id : 5069617013 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes**

**Correct Marks : 1 Wrong Marks : 0**

Which one the following fire extinguisher is NOT used for quenching of fires involved in electrical equipment

**Options :**

1. ✖ CTC Fire extinguisher

2. ✔ Foam type extinguisher

3. ✖ CO<sub>2</sub> type extinguisher

4. ✖ BCF type extinguisher

Question Number : 199 Question Id : 5069617014 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The most important constituents in Gas mask is

Options :

1. ✓ Hopcolite
2. ✗ Caustic soda
3. ✗ Charcoal
4. ✗ Silica gel

Question Number : 200 Question Id : 5069617015 Question Type : MCQ Option Shuffling : Yes

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The optimum or stoichiometric Methane -air mixture at which violent fire damp explosion takes place is

Options :

1. ✗ 5 %
2. ✓ 9.5 %
3. ✗ 12 %
4. ✗ 15 %