

# Andhra Pradesh State Council of Higher Education

## Notations :

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

|                                         |                                          |
|-----------------------------------------|------------------------------------------|
| Question Paper Name :                   | Mining Engineering 06th May 2025 Shift 2 |
| Subject Name :                          | Mining Engineering                       |
| Creation Date :                         | 2025-05-06 20:31:59                      |
| Duration :                              | 180                                      |
| Total Marks :                           | 200                                      |
| Display Marks:                          | No                                       |
| Share Answer Key With Delivery Engine : | 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 :               | 89040179 |
| 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 :            | 890401307 |
| 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 : 890401331  
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 89040115613 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Order of the matrix  $\begin{bmatrix} 1 & 6 \\ 2 & 0 \\ 7 & -1 \end{bmatrix}$  is

Options :

1. ✖  $1 \times 3$

2. ✔  $3 \times 2$

3. ✖  $2 \times 2$

4. ✖  $3 \times 3$

Question Number : 2 Question Id : 89040115614 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If two rows (or columns) of a determinant of order 3 are identical then the value of determinant is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ -1

4. ✖

Question Number : 3 Question Id : 89040115615 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

Co-factor of -4 in  $\begin{vmatrix} 1 & 2 & 3 \\ -4 & 3 & 6 \\ 2 & -7 & 9 \end{vmatrix}$  is

Options :

1. ✖ 3
2. ✖ 11
3. ✖ 39
4. ✔ -39

Question Number : 4 Question Id : 89040115616 Question Type : MCQ Option Shuffling : No  
 Display Question Number : Yes  
 Correct Marks : 1 Wrong Marks : 0

The Matrix  $\begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$  is

Options :

1. ✖ skew symmetric
2. ✔ Symmetric
3. ✖ symmetric if  $a=b$
4. ✖ Skew symmetric if  $b=c$

Question Number : 5 Question Id : 89040115617 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $A = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$  then  $(A^{-1}) =$

Options :

1. ✓ A
2. ✗  $-A$
3. ✗  $-2A$
4. ✗ 0

Question Number : 6 Question Id : 89040115618 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $\deg f(x) \geq \deg g(x)$ , then the rational fraction  $\frac{f(x)}{g(x)}$  is called

Options :

1. ✗ Polynomial
2. ✗ Proper fraction
3. ✓ Improper fraction
4. ✗ irrational fraction

Question Number : 7 Question Id : 89040115619 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\frac{3x}{x^2+x-2} = \frac{A}{x+2} + \frac{B}{x-1}$  then the ordered pair (A, B) is

Options :

1. ✖ (1, 2)

2. ✖ (-1, 2)

3. ✖ (2, -1)

4. ✔ (2, 1)

Question Number : 8 Question Id : 89040115620 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $\tan A = \frac{4}{3}$  then the value of  $\cos 2A$  is

Options :

1. ✔  $-\frac{7}{25}$

2. ✖  $-\frac{7}{24}$

3. ✖  $-\frac{24}{7}$

4. ✖  $-\frac{7}{25}$

Question Number : 9 Question Id : 89040115621 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $-1 \leq x \leq 1$ , then  $\cos^{-1} x + \sin^{-1} x =$

Options :

1. ✖  $-\frac{\pi}{2}$

2. ✖  $\frac{\pi}{4}$

3. ✔  $\frac{\pi}{2}$

4. ✖  $-\frac{\pi}{16}$

Question Number : 10 Question Id : 89040115622 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\sin 15^\circ =$

Options :

1. ✖  $\frac{\sqrt{3}-1}{\sqrt{3}+2}$

2. ✔  $\frac{\sqrt{6}-\sqrt{2}}{4}$

3. ✖  $\sqrt{6} \pm 1$

4. ✖  $\frac{\sqrt{6}+\sqrt{2}}{4}$

Question Number : 11 Question Id : 89040115623 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $2 \cos \theta = x + \frac{1}{x}$  then  $2 \cos 3 \theta =$

Options :

1. ✖  $x^3 - \frac{1}{x^3}$

2. ✖  $-x^3 + \frac{1}{x^3}$

3. ✔  $x^3 + \frac{1}{x^3}$

4. ✖  $x^2 + \frac{1}{x^3}$

Question Number : 12 Question Id : 89040115624 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In any  $\triangle ABC$ ,  $\tan \frac{B+C}{2} =$

Options :

1. ✖  $c \cot \frac{A}{2}$

2. ✔  $\cot \frac{A}{2}$

3. ✖  $\tan \frac{A}{2}$

4. ✖  $\tan \frac{C}{2}$

Question Number : 13 Question Id : 89040115625 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a triangle  $\Delta ABC$ , the value of  $\cos\left(\frac{B+C}{2}\right)$  in terms of angle A

Options :

1. ✖  $\sqrt{\sin \frac{A}{2}}$

2. ✖  $\sqrt{A/2}$

3. ✔  $\sin \frac{A}{2}$

4. ✖  $\sqrt{2A}$

Question Number : 14 Question Id : 89040115626 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The value of  $\sin 45^\circ$  is

Options :

1. ✖  $\sqrt{2}$

2. ✖ 1

3. ✖ 0

4. ✔  $1/\sqrt{2}$

Question Number : 15 Question Id : 89040115627 Question Type : MCQ Option Shuffling : No

Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0



In a  $\Delta ABC$ , if  $a = 13$ ,  $b = 14$  and  $c = 15$  then the value of  $\tan\left(\frac{A}{2}\right)$  is

Options :

1. ✖  $\frac{1}{4}$

2. ✖  $\frac{3}{4}$

3. ✔  $\frac{1}{2}$

4. ✖  $\frac{1}{6}$

Question Number : 16 Question Id : 89040115628 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In a  $\Delta ABC$ ,  $\sum a^3 \cos(B - C) =$

Options :

1. ✖  $4abc$

2. ✔  $3abc$

3. ✖  $4a+b+c$

4. ✖  $abc$

Question Number : 17 Question Id : 89040115629 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Principle value of  $\cot^{-1}(-1)$  is

Options :

1. ✖  $\frac{2\pi}{3}$

2. ✖  $-\frac{2\pi}{3}$

3. ✖  $\pi$

4. ✔  $\frac{3\pi}{4}$

Question Number : 18 Question Id : 89040115630 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✖  $\frac{1}{2} + i$

2. ✖  $-\frac{1}{2} - i$

3. ✔  $-\frac{1}{2} + i$

4. ✖  $\frac{1}{2} \pm i$

Question Number : 19 Question Id : 89040115631 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\text{For any real } \theta, (\cos \theta + i \sin \theta)(\cos \theta - i \sin \theta) =$$

Options :

- 1. ✓ 1
- 2. ✗ -1
- 3. ✗ 0
- 4. ✗ 4i

Question Number : 20 Question Id : 89040115632 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The centre and radius of the circle  $x^2 + y^2 - 4x - 8y - 41 = 0$  are

Options :

- 1. ✗  $(1, -2), 5$
- 2. ✗  $(2, 1), 3$
- 3. ✓  $(2, 4), \sqrt{61}$
- 4. ✗  $(1, -2), \sqrt{51}$

Question Number : 21 Question Id : 89040115633 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The number of common tangents to the circles  $x^2 + y^2 - x = 0$  and  $x^2 + y^2 + x = 0$  is

Options :

- 1. ✗ 2
- 2. ✗ 1

3. ✖ 4

4. ✔ 3

Question Number : 22 Question Id : 89040115634 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Equation of the circle with centre  $(-3, 2)$  and radius 4 is

Options :

1. ✖  $(x^2 + 3)^2 + (y + 2)^2 = 4^2$

2. ✖  $(x - 3)^2 + (y + 2)^2 = 16$

3. ✔  $(x + 3)^2 + (y - 2)^2 = 16$

4. ✖  $(x - 2) + (y + 3)^2 = 4^2$

Question Number : 23 Question Id : 89040115635 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The length of the latus rectum of the parabola  $y^2 = 12x$  and the focal distance of the point  $(3, -6)$  is

Options :

1. ✖ 3, 4

2. ✖ 2, 6

3. ✖ -12, 6

4. ✔ 12, 6

Question Number : 24 Question Id : 89040115636 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The equation of the Parabola, whose focus is (0,-2) and the vertex is (0,0), is

Options :

1. ✖  $y^2 = 32x$
2. ✔  $x^2 = -8y$
3. ✖  $x^2 = 4y$
4. ✖  $y^2 = -32x$

Question Number : 25 Question Id : 89040115637 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The eccentricity of  $x^2 + 2y^2 = 3$  is

Options :

1. ✖  $\frac{1}{\sqrt{2}}$
2. ✖  $\sqrt{2}$
3. ✖  $\pm\sqrt{2}$
4. ✔  $\frac{\sqrt{3}}{2}$

Question Number : 26 Question Id : 89040115638 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx}[e^x(x^2 + 1)] =$$

Options :

1. ✓  $e^x(2x + x^2 + 1)$

2. ✗  $e^x(2x - x^2 + 1)$

3. ✗  $e^x(2x + x^3 + 1)$

4. ✗  $e^{-x}(2x + x^2 + 1)$

Question Number : 27 Question Id : 89040115639 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\text{When } a > 0, \lim_{x \rightarrow 0} \frac{a^x - 1}{x} =$$

Options :

1. ✓  $\log a$

2. ✗  $0$

3. ✗  $\log (x-1)$

4. ✗  $\log (x-a)$

Question Number : 28 Question Id : 89040115640 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} [\tan^{-1} x] =$$

Options :

1. ✓  $\frac{1}{x^2+1}$

2. ✗  $-\frac{1}{x^2-1}$

3. ✗  $\frac{2}{x^2+2}$

4. ✗  $-\frac{1}{x^2+1}$

Question Number : 29 Question Id : 89040115641 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $4x-7y+15=0$  then derivative of y with respect to x is

Options :

1. ✗  $-4/7$

2. ✗  $0$

3. ✗  $4$

4. ✓  $4/7$

Question Number : 30 Question Id : 89040115642 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

1. ✓  $-\cos x$

2. ✗  $-\sin x$

3. ✗  $\cos x$

4. ✗  $\sin x$

Question Number : 31 Question Id : 89040115643 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $u = e^x \sin y$  then first partial derivative of  $u$  with respect to  $y$  is

Options :

1. ✗  $e^x \sin y$

2. ✓  $e^x \cos y$

3. ✗  $-e^x \cos y$

4. ✗  $0$

Question Number : 32 Question Id : 89040115644 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\frac{d}{dx} \left( e^{3 \log x} \right) =$$

Options :

1. ✗  $\log x$

2. ✗



3x

3. ✖  $x^3$

4. ✔  $3x^2$

Question Number : 33 Question Id : 89040115645 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $u(x, y) = \sin^{-1} \frac{x}{y} + \tan^{-1} \frac{y}{x}$  then  $xu_x + yu_y =$

Options :

1. ✖  $u'(x, y)$

2. ✔ 0

3. ✖ 1

4. ✖  $u(x, y)$

Question Number : 34 Question Id : 89040115646 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $S = 12t - 3t^2$  then  $\frac{ds}{dt} =$

Options :

1. ✔  $12 - 6t$

2. ✖  $12t - 6$

3. ✖

$$12 - 3t$$

4. ✖  $12 - 6t^2$

Question Number : 35 Question Id : 89040115647 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$$\int \cot^2 x \, dx =$$

Options :

1. ✖  $-\cot x + x + c$

2. ✖  $\cot x - x + c$

3. ✖  $\cot^2 x - x + c$

4. ✔  $-\cot x - x + c$

Question Number : 36 Question Id : 89040115648 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

$$\int \frac{1}{\sqrt{a^2 - x^2}} \, dx =$$

Options :

1. ✖  $\log|x + \sqrt{x^2 + a^2}| + c$

2. ✖  $\log|x + \sqrt{x^2 - a^2}| + c$

3. ✔  $\sin^{-1} \frac{x}{a} + c$

4. ✖  $\sin^{-1}x$

Question Number : 37 Question Id : 89040115649 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int e^x \cos x \, dx =$$

Options :

1. ✔  $\frac{1}{2}e^x(\cos x + \sin x) + c$

2. ✖  $\frac{1}{2}e^x \cos x$

3. ✖  $\frac{1}{2}e^x(\cos x + \operatorname{cosec} x) + c$

4. ✖  $\frac{1}{2}e^x(\cos x - \sin x) + c$

Question Number : 38 Question Id : 89040115650 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \frac{dx}{\sqrt{x}} =$$

Options :

1. ✖  $-2\sqrt{x} + c$

2. ✖  $\sqrt{x} + c$

3. ✔  $2\sqrt{x} + c$

4. ✖  $x + c$

Question Number : 39 Question Id : 89040115651 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int \sin \frac{y}{2} dy =$$

Options :

1. ✖  $2 \cos \frac{y}{2} + c$

2. ✖  $2 \sin x/2 + c$

3. ✖  $2 \cos 2y + c$

4. ✔  $-2 \cos \frac{y}{2} + c$

Question Number : 40 Question Id : 89040115652 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\pi} dx =$$

Options :

1. ✖  $\frac{\pi}{2}$

2. ✖  $-\frac{\pi}{2}$

3. ✔  $\pi$

4. ✖  $\frac{\pi}{8}$

Question Number : 41 Question Id : 89040115653 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

If  $f(x)$  is an even function, then  $\int_{-a}^a f(x) dx =$

Options :

- 1. ✖  $\int_0^a f(x) dx$
- 2. ✔  $2 \int_0^a f(x) dx$
- 3. ✖  $2a$
- 4. ✖  $0$

Question Number : 42 Question Id : 89040115654 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The area under the curve  $f(x) = \sin x$  in  $[0, 2\pi]$  is

Options :

- 1. ✖  $1$
- 2. ✖  $3$
- 3. ✖  $-4$
- 4. ✔  $4$

Question Number : 43 Question Id : 89040115655 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

When  $a=b$  then  $\int_a^b f(x)dx =$

Options :

1. ✖ b

2. ✔ 0

3. ✖ a

4. ✖ 2a

Question Number : 44 Question Id : 89040115656 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Order of the differential equation  $\left[ \frac{d^2y}{dx^2} + \left( \frac{dy}{dx} \right)^3 \right]^{6/5} = 6y$  is

Options :

1. ✖ 3

2. ✔ 2

3. ✖ 6/5

4. ✖ 3

Question Number : 45 Question Id : 89040115657 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The Integrating factor of  $\frac{dy}{dx} + 3x = 2y$  is

Options :

1. ✖

$e^{3x}$

2. ✓  $e^{-2x}$

3. ✗  $e^x$

4. ✗ 0

Question Number : 46 Question Id : 89040115658 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Transform  $dx + xdy = e^{-y}\sec^2 y \, dy$  into linear form

Options :

1. ✗  $\frac{dx}{dy} - x = e^{-y}\sec^2 y$

2. ✗  $\frac{dx}{dy} = e^{-y}\sec^2 y$

3. ✗  $\frac{dx}{dy} + x = e^{-y}\sec^2 y + c$

4. ✓  $\frac{dx}{dy} + x = e^{-y}\sec^2 y$

Question Number : 47 Question Id : 89040115659 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The necessary and sufficient condition for the differential equation  $Mdx + Ndy = 0$  to be exact is

Options :

1. ✗

$$\frac{\partial M}{\partial y} = \frac{\partial N}{\partial y}$$

2. ✓  $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

3. ✗  $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$

4. ✗  $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial x}$

Question Number : 48 Question Id : 89040115660 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Complementary function of the differential equation  $(D^3 - 8)y = x$  is

Options :

1. ✗  $c_1 e^{2x} + e^x \{c_2 \cos(x\sqrt{3}) + c_3 \sin x\sqrt{3}\}$

2. ✗  $c_1 e^{2x} + e^{-x} (\cos\sqrt{3} + \sin\sqrt{3})$

3. ✗  $c_1 e^{-2x} + c_2 e^{-x} + c_3 \cos x$

4. ✓  $c_1 e^{2x} + e^{-x} \{c_2 \cos(x\sqrt{3}) + c_3 \sin(x\sqrt{3})\}$

Question Number : 49 Question Id : 89040115661 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0



Bernoulli's equation is of the form

Options :

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

2. ✖  $\left(\frac{dy}{dx}\right)^2 + y^n = Qy$

3. ✔  $\left(\frac{dy}{dx}\right) + Py = Qy^n$

4. ✖  $\left(\frac{d^2y}{dx^2}\right) + Py = Qy^n$

Question Number : 50 Question Id : 89040115662 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Particular integral of  $f(D)y = \cos ax$  is

Options :

1. ✔  $\frac{1}{f(-a^2)} \cos ax$  if  $f(-a^2) \neq 0$

2. ✖  $\frac{1}{f(a^2)} \cos ax$  if  $f(-a^2) \neq 0$

3. ✖  $\frac{1}{f(a)} \cos ax$  if  $f(-a^2) \neq 0$

4. ✖  $\frac{1}{2} \cos ax$  if  $f(-a^2) \neq 0$

# Physics

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 890401308 |
| 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 :                      | 890401332 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 51 Question Id : 89040115663 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the unit of mass is 1 Kg, the unit of length is 1m and the unit of time is 1 minute,  
the unit of pressure in  $\text{Nm}^{-2}$  is

Options :

1. ✖  $\frac{1}{60}$

2. ✖ 60

3. ✔  $\frac{1}{3600}$

4. ✖ 3600

Question Number : 52 Question Id : 89040115664 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

$\text{MLT}^{-1}$  is the dimensional formula for

Options :

1. ✖

Speed

2. ✖ Acceleration

3. ✔ Impulse

4. ✖ Force

Question Number : 53 Question Id : 89040115665 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If  $|\vec{A} \times \vec{B}| = \sqrt{3} \vec{A} \cdot \vec{B}$  then the value of  $|\vec{A} + \vec{B}|$  is

Options :

1. ✔  $(A^2 + B^2 + AB)^{1/2}$

2. ✖  $(A^2 + B^2 + \frac{AB}{\sqrt{2}})^{1/2}$

3. ✖  $A + B$

4. ✖  $(A^2 + B^2 + \sqrt{3}AB)^{1/2}$

Question Number : 54 Question Id : 89040115666 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Of the vectors given below, the parallel vectors are

$$\vec{A} = 6\hat{i} + 8\hat{j} \quad \vec{B} = 210\hat{i} + 280\hat{k} \quad \vec{C} = 5.1\hat{i} + 6.8\hat{j} \quad \vec{D} = 3.6\hat{i} + 8\hat{j} + 48\hat{k}$$

Options :

1. ✔  $\vec{A}$  and  $\vec{C}$

2. ✖  $\vec{A}$  and  $\vec{B}$

3. ✖  $\vec{A}$  and  $\vec{D}$

4. ✖  $\vec{C}$  and  $\vec{D}$

**Question Number : 55 Question Id : 89040115667 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The position  $x$  of a particle with respect to time ' $t$ ' along  $x$ - axis is given by  $x = 9t^2 - t^3$  where  $x$  is in metres and  $t$  in seconds. The position of this particle when it achieves maximum speed along the  $x$  direction is

**Options :**

1. ✖ 24 m

2. ✖ 32 m

3. ✔ 54 m

4. ✖ 81 m

**Question Number : 56 Question Id : 89040115668 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A ball is projected vertically up with a velocity of  $40 \text{ ms}^{-1}$  from ground. At the same time another ball is dropped from a height of 100 m. The magnitudes of their velocities are equal after

**Options :**

1. ✖ 1 s

2. ✓ 2 s

3. ✗ 3 s

4. ✗ 4 s

**Question Number : 57 Question Id : 89040115669 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

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

**Options :**

1. ✗ 336

2. ✗ 224

3. ✗ 56

4. ✓ 34

**Question Number : 58 Question Id : 89040115670 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A projectile is thrown into air with velocity  $u$  at an angle  $\theta$  to the horizontal. The time at which its direction of motion is perpendicular to its initial direction is

**Options :**

1. ✓  $\frac{u}{g \sin \theta}$

2. ✗

$$\frac{u}{g \cos \theta}$$

3. ✖  $\frac{u}{g \tan \theta}$

4. ✖  $\frac{u}{g \cot \theta}$

**Question Number : 59 Question Id : 89040115671 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

When a bicycle is in motion and pedalled, the force of friction exerted by ground on the two wheels is such that it acts

**Options :**

1. ✔ In the backward direction on the front wheel and in the forward direction on the rear wheel
2. ✖ In the forward direction on the front wheel and in the backward direction on the rear wheel
3. ✖ In the backward direction on both the front and rear wheels
4. ✖ In the forward direction on both the front and rear wheels

**Question Number : 60 Question Id : 89040115672 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Two blocks of masses 4 Kg and 2 Kg are connected by a heavy string and placed on rough horizontal plane. The 2 Kg block is pulled with a constant force F. The coefficient of friction between the blocks and the ground is 0.5. The value of F so that tension in the string is constant throughout during the motion of the blocks is

**Options :**

1. ✖

40 N

2. ✓ 30 N

3. ✗ 50 N

4. ✗ 60 N

**Question Number : 61 Question Id : 89040115673 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In a hydroelectric power station, the height of the dam is 10 m. How many kilograms of water must fall per second on the blades of a turbine in order to generate 1 MW of electrical power? [  $g = 10 \text{ m/s}^2$  ].

**Options :**

1. ✗  $10^3 \text{ Kg/s}$

2. ✓  $10^4 \text{ Kg/s}$

3. ✗  $10^5 \text{ Kg/s}$

4. ✗  $10^6 \text{ Kg/s}$

**Question Number : 62 Question Id : 89040115674 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The kinetic energy at the highest point of the trajectory of a projectile is 200 J. If the mass of the projectile is 1 Kg and the maximum height reached by it is 20 m, then velocity of the projectile from the ground is

**Options :**



1. ✖ 20 m/s
2. ✖ 10 m/s
3. ✔  $20\sqrt{2}$  m/s
4. ✖  $10\sqrt{2}$  m/s

**Question Number : 63 Question Id : 89040115675 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A force applied by an engine on train of mass  $2.05 \times 10^6$  Kg changes its velocity from 5 m/s to 25 m/s in 5 minutes. The power of the engine is

**Options :**

1. ✖ 1.025 MW
2. ✔ 2.05 MW
3. ✖ 5 MW
4. ✖ 6 MW

**Question Number : 64 Question Id : 89040115676 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Two identical wires have a fundamental frequency of 100 Hz when kept under the same tension. If the tension of one of the wires is increased by 21%, the number of beats produced is

**Options :**

1. ✖ 11



2. ✓ 10

3. ✗ 9

4. ✗ 8

**Question Number : 65 Question Id : 89040115677 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A body executing S.H.M. has a maximum velocity of  $1 \text{ ms}^{-1}$  and a maximum acceleration of  $4 \text{ ms}^{-2}$ . Its amplitude in metres is:

**Options :**

1. ✗ 1

2. ✗ 0.75

3. ✗ 0.5

4. ✓ 0.25

**Question Number : 66 Question Id : 89040115678 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A simple pendulum of length  $l_1$  has frequency  $\frac{1}{4}$  Hz and another simple pendulum of length  $l_2$  has frequency  $\frac{1}{3}$  Hz. Then time period of pendulum of length  $(l_1 + l_2)$  is

**Options :**

1. ✗ 5 s

2. ✗ 1 s

3. ✓  $\sqrt{7}$  s

4. ✗  $\sqrt{12}$  s

**Question Number : 67 Question Id : 89040115679 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A source of sound producing wavelength of 50 cm is moving away from stationary observer with  $\frac{1}{5}$ th speed of sound. The wavelength of the sound heard by the observer is

**Options :**

1. ✗ 70 cm

2. ✗ 55 cm

3. ✗ 40 cm

4. ✓ 60 cm

**Question Number : 68 Question Id : 89040115680 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

To have a good sound effect inside a hall

**Options :**

1. ✗ the hall should not have any sound absorbing material

2. ✗ the reverberation time has to be maximum

3. ✗ the reverberation time has to be zero

4. ✓ the reverberation time has to be optimum

**Question Number : 69 Question Id : 89040115681 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

If the pressure of an ideal gas contained in a closed vessel is increased by 0.5%, the increase in temperature is  $2^{\circ}\text{C}$ . The initial temperature of the gas is

**Options :**

1. ✗  $27^{\circ}\text{C}$

2. ✓  $127^{\circ}\text{C}$

3. ✗  $300^{\circ}\text{C}$

4. ✗  $400^{\circ}\text{C}$

**Question Number : 70 Question Id : 89040115682 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

During the free expansion of an ideal gas, which of the following physical quantity remains constant

**Options :**

1. ✓ Temperature

2. ✗ Pressure

3. ✗ Volume

4. ✗ Ratio of pressure to volume

Question Number : 71 Question Id : 89040115683 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The specific heat at constant volume for a monoatomic gas is  $0.075 \text{ cal/kg/K}$  and its gram molecular specific heat is  $3 \text{ cal/mol/K}$ . Then mass of one atom of that gas is

Options :

1. ✓  $6.67 \times 10^{-23} \text{ gm}$
2. ✗  $6.67 \times 10^{23} \text{ gm}$
3. ✗  $2 \times 10^{-23} \text{ gm}$
4. ✗  $2 \times 10^{23} \text{ gm}$

Question Number : 72 Question Id : 89040115684 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

A rigid diatomic ideal gas undergoes an adiabatic process at room temperature. The relation between temperature and volume of this process is  $TV^x = \text{constant}$ . Then x is

Options :

1. ✗  $\frac{5}{3}$
2. ✓  $\frac{2}{5}$
3. ✗  $\frac{2}{3}$
4. ✗  $\frac{3}{5}$

Question Number : 73 Question Id : 89040115685 Question Type : MCQ Option Shuffling : No

**Display Question Number : Yes**

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

A carnot engine having an efficiency of  $\frac{1}{10}$  as heat engine, is used as a refrigerator. If the work done on the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is

**Options :**

1. ✖ 100 J

2. ✖ 99 J

3. ✔ 90 J

4. ✖ 80 J

**Question Number : 74 Question Id : 89040115686 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

Two photons of energy 2.5 eV and 3.5 eV fall on a metal surface of work function 1.5 eV.

The ratio of the maximum velocities of the photoelectrons emitted from the metal surface is

**Options :**

1. ✖ 1 : 4

2. ✖ 2 : 1

3. ✖ 1 : 2

4. ✔  $1 : \sqrt{2}$

**Question Number : 75 Question Id : 89040115687 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

At critical angle, the angle of refraction is

Options :

1. ✖  $45^0$
2. ✔  $90^0$
3. ✖  $120^0$
4. ✖  $180^0$

## Chemistry

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 890401309 |
| 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 :                      | 890401333 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 76 Question Id : 89040115688 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The quantum number which describes the shape of an atomic orbital is indicated by the symbol

Options :

1. ✔  $l$
2. ✖  $ml$
3. ✖

4. ✖ 11

Question Number : 77 Question Id : 89040115689 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

“No two electrons in an atom can have the same set of four quantum numbers”.  
This is known as

Options :

1. ✖ Pauli's Principle

2. ✔ Hund's Rule

3. ✖ Aufbau Principle

4. ✖ Lewis Rule

Question Number : 78 Question Id : 89040115690 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In the elements with atomic number  $Z=1$  to  $Z=20$ ,  
how many of them have no unpaired electrons in their ground state?

Options :

1. ✖ 8

2. ✖ 4

3. ✖ 10

4. ✔ 6

Question Number : 79 Question Id : 89040115691 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following is not a property of covalent compounds?

Options :

1. ✖ They are generally insoluble in water
2. ✖ They consist of molecules
3. ✖ They exist as solids, liquids or gases
4. ✔ The reactions between them are fast

Question Number : 80 Question Id : 89040115692 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The sum of covalent bonds in  $\text{H}_2$ ,  $\text{N}_2$  and  $\text{HCl}$  is

Options :

1. ✖ 4
2. ✔ 5
3. ✖ 6
4. ✖ 3

Question Number : 81 Question Id : 89040115693 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0



How many grams of NaOH is required to prepare 5.0 litre of 0.1 N solution?

(Given: At. wt: H=1, O=16, Na=23)

**Options :**

- 1. ✓ 20
- 2. ✗ 30
- 3. ✗ 10
- 4. ✗ 50

**Question Number : 82 Question Id : 89040115694 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A gaseous mixture contains 8g of oxygen, 14 g of nitrogen and 8 g of hydrogen.

Total number of molecules present in the gaseous mixture is

(Given: At. wt: H=1, N=14, O=16,  $N_A = 6 \times 10^{23} \text{ mol}^{-1}$ )

**Options :**

- 1. ✗  $1.43 \times 10^{23}$
- 2. ✗  $2.85 \times 10^{23}$
- 3. ✓  $2.85 \times 10^{24}$
- 4. ✗  $1.85 \times 10^{24}$

**Question Number : 83 Question Id : 89040115695 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The equivalent weight of which of the following is the highest?

**Options :**

- 1. ✗  $\text{Na}_2\text{CO}_3$  (molecular weight = 106)

2. ✖  $\text{H}_3\text{PO}_4$  (molecular weight = 98)

3. ✔  $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$  (molecular weight = 126)

4. ✖  $\text{AlCl}_3$  (molecular weight = 133.5)

Question Number : 84 Question Id : 89040115696 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

At  $25^\circ\text{C}$ , ionic product ( $K_w$ ) of 0.01M HCl solution is

Options :

1. ✖  $1.0 \times 10^{-13} \text{ mol}^2/\text{L}^2$

2. ✖  $1.0 \times 10^{-12} \text{ mol}^2/\text{L}^2$

3. ✔  $1.0 \times 10^{-14} \text{ mol}^2/\text{L}^2$

4. ✖  $1.0 \times 10^{-15} \text{ mol}^2/\text{L}^2$

Question Number : 85 Question Id : 89040115697 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

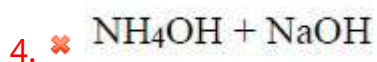
Correct Marks : 1 Wrong Marks : 0

Which of the following combinations give a buffer solution?

Options :

1. ✖  $\text{HCl} + \text{NaCl}$

2. ✔  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$



**Question Number : 86 Question Id : 89040115698 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A current of 0.5 amp is passed through molten  $\text{AlCl}_3$  for 96.5 seconds. The volume of  $\text{Cl}_2$  gas liberated at STP at anode (in ml) is ( $\text{Cl} = 35.5 \text{ u}$ ) ( $1\text{F} = 96500 \text{ C mol}^{-1}$ )

**Options :**

1. ✖ 11.2

2. ✖ 22.4

3. ✔ 5.6

4. ✖ 33.6

**Question Number : 87 Question Id : 89040115699 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The amount of substance deposited due to passage of 1F of electricity is called

**Options :**

1. ✖ Atomic weight

2. ✔ Equivalent weight

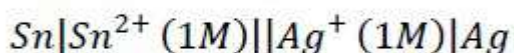
3. ✖ Electrochemical equivalent

4. ✖ Molecular weight

Question Number : 88 Question Id : 89040115700 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

What is the emf of the cell?



[Given  $E_{\text{Sn}^{2+}|\text{Sn}}^0 = -0.14V$  and  $E_{\text{Ag}^+|\text{Ag}}^0 = +0.80 V$ ]

Options :

1. ✖ 0.66 V

2. ✖ 0.80 V

3. ✖ 1.08 V

4. ✔ 0.94 V

Question Number : 89 Question Id : 89040115701 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

If the standard reduction potentials of A,B,C are respectively 0.68V, -2.54V and -0.50 V, then the order of their reducing power is

Options :

1. ✖ A>B>C

2. ✖ A>C>B

3. ✖ C>B>A

4. ✔ B>C>A

Question Number : 90 Question Id : 89040115702 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

With which of the following anions,  $Mg^{2+}$  and  $Ca^{2+}$  ions form salts responsible for permanent hardness of water?

Options :

1. ✓  $Cl^{-}, SO_4^{2-}$
2. ✗  $Cl^{-}, NO_2^{-}$
3. ✗  $HCO_3^{-}, Cl^{-}$
4. ✗  $CO_3^{2-}, HCO_3^{-}$

Question Number : 91 Question Id : 89040115703 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Exhausted permutit is regenerated by washing with

Options :

1. ✗ Dilute NaOH solution
2. ✓ Dilute NaCl solution
3. ✗ Dilute HCl solution
4. ✗ Dilute  $AlCl_3$  solution

Question Number : 92 Question Id : 89040115704 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

27.2 mg of  $CaSO_4$  and 2.4 mg of  $MgSO_4$  are present in a 2 kg water sample.

What is the total hardness of water (in ppm) in terms of equivalents of  $CaCO_3$ ?

(molecular weight of  $CaSO_4$  = 136 & molecular weight of  $MgSO_4$  = 120)

**Options :**

- 1. ✓ 11
- 2. ✗ 10
- 3. ✗ 20
- 4. ✗ 22

**Question Number : 93 Question Id : 89040115705 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Statement I: The lower the pH greater is the corrosion

Statement II: Electrochemical Corrosion always occurs at the anodic area.

The correct answer is

**Options :**

- 1. ✓ Both statement – I and Statement – II are correct
- 2. ✗ Both statement – I and Statement – II are not correct
- 3. ✗ Statement – I is correct but statement – II is not correct
- 4. ✗ Statement – I is not correct but statement – II is correct

**Question Number : 94 Question Id : 89040115706 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Rust is chemically

**Options :**

- 1. ✓ Hydrated Ferric Oxide

2. ✖ Hydrated Copper (II) Chloride

3. ✖ Hydrated Ferrous Sulphate

4. ✖ Hydrated Ferric Sulphate

Question Number : 95 Question Id : 89040115707 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The monomer of Teflon is X. The number of fluorine atoms in X is

Options :

1. ✖ 2

2. ✖ 3

3. ✔ 4

4. ✖ 1

Question Number : 96 Question Id : 89040115708 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Bakelite is an example of

Options :

1. ✖ Thermoplastic Polymer

2. ✖ Elastomer

3. ✖ Fibre



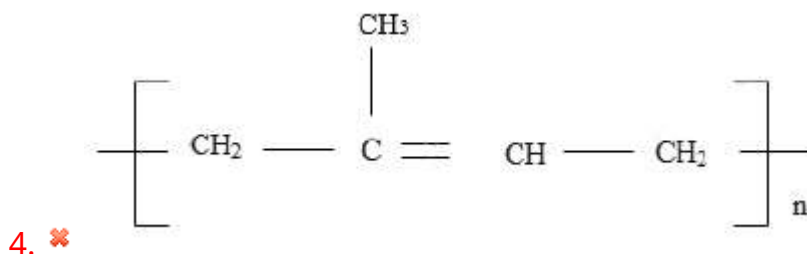
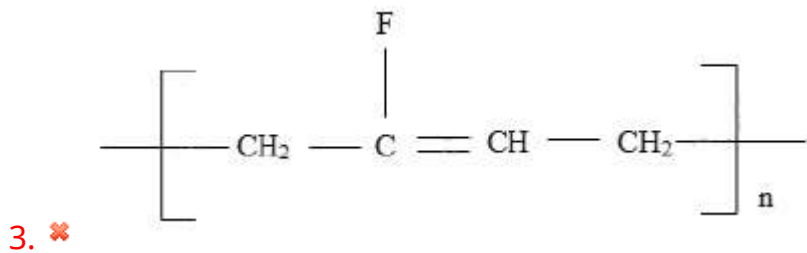
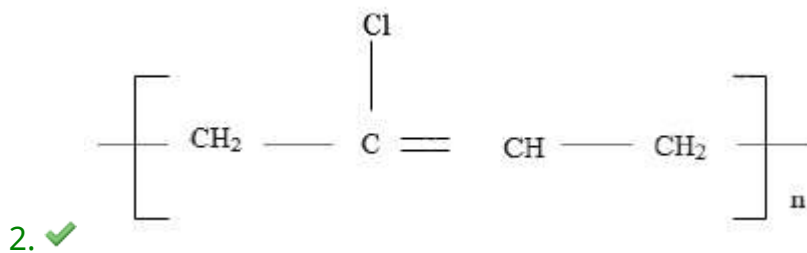
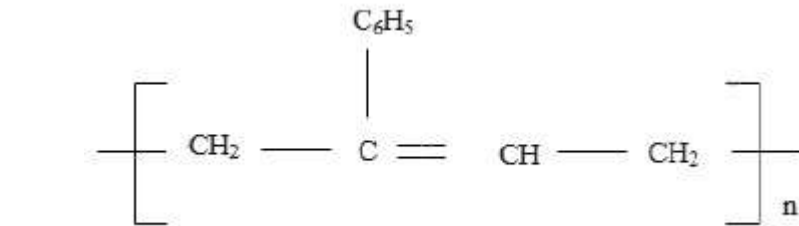
4. ✓ Thermosetting polymer

Question Number : 97 Question Id : 89040115709 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The correct structure of neoprene rubber is

Options :



Question Number : 98 Question Id : 89040115710 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is NOT regarded as a primary fuel?



Options :

1. ✖ Natural gas
2. ✔ Coal gas
3. ✖ Lignite
4. ✖ Crude oil

Question Number : 99 Question Id : 89040115711 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

pH of acid rain water is generally in the range of

Options :

1. ✖ 1.0 - 3.0
2. ✔ 3.5 - 5.6
3. ✖ 5.9 - 6.9
4. ✖ 7.1 - 7.5

Question Number : 100 Question Id : 89040115712 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

In \_\_\_\_\_ part of the atmosphere ozone layer is present.

Options :

1. ✖ Troposphere
2. ✖ Thermosphere

3. ✓ Stratosphere

4. ✖ Mesosphere

## Mining Engineering

|                                       |           |
|---------------------------------------|-----------|
| Section Id :                          | 890401310 |
| 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 :                      | 890401334 |
| Question Shuffling Allowed :          | Yes       |

Question Number : 101 Question Id : 89040115713 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The mode of access to the deposit present in a hilly terrain is

Options :

1. ✖ Incline

2. ✖ Shaft

3. ✓ Adit

4. ✖ Decline

Question Number : 102 Question Id : 89040115714 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

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

Bore hole survey means

**Options :**

1. ✖ Measurement of Depth of bore hole
2. ✖ Measurement of time taken to drill hole
3. ✔ Measurement of deviation of bore hole
4. ✖ Identification of properties of bore hole

**Question Number : 103 Question Id : 89040115715 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The process of treating the holes with chemicals to reduce the friction to the passage of cement through rock mass during Cementation method of shaft skinning is

**Options :**

1. ✖ Silicatisation
2. ✔ Pre-Silicatisation
3. ✖ Sensitization
4. ✖ Grouting

**Question Number : 104 Question Id : 89040115716 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The holes left in permanent lining at the curb level to avoid development of hydrostatic pressure behind the lining due to water in shaft sinking are known as

**Options :**

1. ✖ Product holes
2. ✔ Weep holes
3. ✖ Lining holes
4. ✖ Drain holes

**Question Number : 105 Question Id : 89040115717 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The characteristic of an explosive which will give an idea about the storage of explosive under heat, humid and time of exposure

**Options :**

1. ✔ Stability
2. ✖ Sensitivity
3. ✖ Density
4. ✖ Resistance

**Question Number : 106 Question Id : 89040115718 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The type of explosive used for solid blasting is

**Options :**

1. ✖ P1

2. ✖ P3

3. ✖ P4

4. ✔ P5

**Question Number : 107 Question Id : 89040115719 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The prime charge in a detonator is

**Options :**

1. ✖ PETN

2. ✖ TNT

3. ✔ ASA

4. ✖ Ammonium Nitrate

**Question Number : 108 Question Id : 89040115720 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Identify the correct sequence of blasting operations in Underground coal mines

**Options :**

1. ✔ Drilling , Charging, Stemming, Blasting, Mucking

2. ✖ Drilling, Charging, Mucking, Stemming, Blasting

3. ✖ Mucking, Drilling, Charging, Stemming, Blasting

4. ✖ Drilling, Stemming, Charging, Mucking , Blasting

**Question Number : 109 Question Id : 89040115721 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The texture of rocks formed due to consolidation of magma nearer to the surface is

**Options :**

1. ✖ Course texture

2. ✖ Medium texture

3. ✔ Fine texture

4. ✖ Conglomerate

**Question Number : 110 Question Id : 89040115722 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Identify the Correct sequence of formation of coal

**Options :**

1. ✖ Lignite → Peat → Bituminous → Anthracite

2. ✔ Peat → Lignite → Bituminous → Anthracite

3. ✖

Anthracite → Bituminous → Lignite → Peat

4. ✖ Bituminous → Anthracite → Lignite → Peat

Question Number : 111 Question Id : 89040115723 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The vertical displacement of seam in a normal fault is known as

Options :

- 1. ✔ Throw
- 2. ✖ Want
- 3. ✖ Hade
- 4. ✖ Inclination

Question Number : 112 Question Id : 89040115724 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which of the following is an example of sedimentary rock

Options :

- 1. ✖ Granite
- 2. ✖ Basalt
- 3. ✔ Sandstone
- 4. ✖ Schist

Question Number : 113 Question Id : 89040115725 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The point where an earthquake originates is known as

Options :

1. ✖ Epicentre
2. ✖ Iso-seismal
3. ✖ Co-seismal
4. ✔ Focus

Question Number : 114 Question Id : 89040115726 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

Which hypothesis explains the origin of the Earth ?

Options :

1. ✔ Nebular Hypothesis
2. ✖ Plate Tectonic Hypothesis
3. ✖ Big Bang Hypothesis
4. ✖ Null Hypothesis

Question Number : 115 Question Id : 89040115727 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes



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

The process of "Erosion" includes

**Options :**

1. ✖ Deflation and Abrasion
2. ✖ Disintegration and Decomposition
3. ✖ Abrasion and disintegration
4. ✔ Disintegration and Transportation

**Question Number : 116 Question Id : 89040115728 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Identify the minerals based the decreasing order of Moh's Scale of Hardness

**Options :**

1. ✔ Topaz > Quartz > Orthoclase > Fluorite
2. ✖ Quartz > Fluorite > Topaz > Orthoclase
3. ✖ Fluorite > Quartz > Orthoclase > Topaz
4. ✖ Topaz > Orthoclase > Fluorite > Quartz

**Question Number : 117 Question Id : 89040115729 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The type of fold in which younger rock formation is present outside and older rock formation is present inside the fold is known as

**Options :**

1. ✖ Syncline
2. ✔ Anticline
3. ✖ Chevron fold
4. ✖ Recumbent fold

**Question Number : 118 Question Id : 89040115730 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which metamorphic rock is formed by the recrystallization of Limestone ?

**Options :**

1. ✖ Slate
2. ✖ Schist
3. ✔ Marble
4. ✖ Gneiss

**Question Number : 119 Question Id : 89040115731 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

In a mine working the roof fall which takes place soon after withdrawal of supports is called

**Options :**

1. ✔ Local fall
2. ✖

Main fall

3. ✖ Air blast

4. ✖ Rock burst

**Question Number : 120 Question Id : 89040115732 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The sudden release of elastic strain energy stored in pillars result in violent burst of coal pillars is called

**Options :**

1. ✖ Air blast

2. ✖ Rock burst

3. ✔ Coal bump

4. ✖ Premature collapse

**Question Number : 121 Question Id : 89040115733 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The underground road way driven through stone to connect two or more coal seams is known as

**Options :**

1. ✖ Tunnel

2. ✖ Gallery

3. ✖ Cross-cut

4. ✔

## Cross measure drift

**Question Number : 122 Question Id : 89040115734 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The shape of the pillar in flat and moderately inclined seams for adoption of shuttle car and locomotive is

**Options :**

1. ✓ Rhombus
2. ✗ Circular
3. ✗ Square
4. ✗ Rectangle

**Question Number : 123 Question Id : 89040115735 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The method mining suitable for the extraction of coal seams with dirt bands is

**Options :**

1. ✗ Board and Pillar method
2. ✓ Longwall method
3. ✗ Slicing method
4. ✗ Hydraulic Mining

**Question Number : 124 Question Id : 89040115736 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

In Board and Pillar method of mining with Hydraulic stowing, the preferred method of extraction of pillars is

**Options :**

1. ✓ Step diagonal

2. ✗ Vertical line

3. ✗ Diagonal line

4. ✗ Straight line

**Question Number : 125 Question Id : 89040115737 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

The centre-to-centre size of coal pillars developed in Board and Pillar mining is 40 m x 40 m working at 280 m depth has 4.0 m wide galleries. What area of roof does a pillar support according to tributary area theory?

**Options :**

1. ✗ 4480 sq.m

2. ✗ 1936 sq.m

3. ✓ 1600 sq.m

4. ✗ 1296 sq.m

**Question Number : 126 Question Id : 89040115738 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

In sand stowing in-correct Hydraulic profile leads to

**Options :**

1. ✓ Formation of cavities in the flow
2. ✗ Damage of pipes
3. ✗ Jamming of pipes
4. ✗ Setup pulsation

**Question Number : 127 Question Id : 89040115739 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The width of the heading in Board and Pillar method of working depends on

**Options :**

1. ✗ Depth of working
2. ✗ Size of pillars
3. ✓ Face machinery used
4. ✗ Ventilation required

**Question Number : 128 Question Id : 89040115740 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A coal heading is of 4 m wide and 2.5 m height has an advance of 1 m per cycle. The amount of explosive used is 5 kg per blast. Taking specific gravity of coal as  $1.2 \text{ t/m}^3$ . The powder factor is

**Options :**

1. ✖ 1.55 te/kg
2. ✔ 2.40 te/kg
3. ✖ 2.99 te/kg
4. ✖ 3.32 te/kg

**Question Number : 129 Question Id : 89040115741 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In metal mining most of the development is always carried out in

**Options :**

1. ✖ Hanging wall
2. ✔ Foot wall
3. ✖ Across the deposit
4. ✖ Away from deposit

**Question Number : 130 Question Id : 89040115742 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

During development of Metalliferous deposits, the pillar left in its in-situ condition to protect upper level is known as

**Options :**

1. ✔ Crown pillar
2. ✖



Sill pillar

3. ✖ Rib pillar

4. ✖ Barrier

**Question Number : 131 Question Id : 89040115743 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The method of stoping **NOT** suitable if the ore body is subjected to Spontaneous heating is

**Options :**

1. ✖ Sub level Caving

2. ✖ Cut and fill method

3. ✔ Shrinkage Stoping

4. ✖ Room and Pillar method

**Question Number : 132 Question Id : 89040115744 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

During development of metalliferous deposits, the method of connecting two levels from upper level to lower level is known as

**Options :**

1. ✔ Winze

2. ✖ Raise



3. ✖ Cross cut

4. ✖ Cross measure drift

**Question Number : 133 Question Id : 89040115745 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Identify the method of stoping used under the following conditions of ore body

|                   |   |                |
|-------------------|---|----------------|
| Type of Ore body  | - | Massive        |
| Strength of Ore   | - | Weak           |
| Strength of Walls | - | Weak or Strong |

**Options :**

1. ✖ Sublevel Stoping method

2. ✖ Shrinkage Stoping method

3. ✖ Cut and fill method

4. ✔ Block Caving

**Question Number : 134 Question Id : 89040115746 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The method of stoping used for the extraction of Narrow vein deposits

**Options :**

1. ✖ Sub level caving

2. ✓ Resuing

3. ✗ Room and Pillar method

4. ✗ Cut and fill method

**Question Number : 135 Question Id : 89040115747 Question Type : MCQ Option Shuffling : No 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. ✗ Brest stoping

4. ✗ Room and Pillar stoping

**Question Number : 136 Question Id : 89040115748 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Identify the method of stoping preferred under the following conditions of the ore body

Type of Ore body - Thin

Dip - Flat

Strength of Ore - Strong

Strength of walls - Strong

**Options :**

1. ✗ Sublevel stoping

2. ✖ Sub level Caving

3. ✔ Room and pillar

4. ✖ Top slicing

**Question Number : 137 Question Id : 89040115749 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Sub-level stoping method belongs to

**Options :**

1. ✖ Heavily supported class

2. ✖ Artificially supported class

3. ✖ Caving type

4. ✔ Open stoping type

**Question Number : 138 Question Id : 89040115750 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The roadway driven to interconnect the shaft and ore body is known as

**Options :**

1. ✖ Cross measure drift

2. ✔ Cross-cut

3. ✖ Tunnel

4. ✖ Level roadway

**Question Number : 139 Question Id : 89040115751 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Two mine haulage roadways A and B are having similar cross-sectional areas, surface characteristics, but differ in lengths. The length road way A is 100 m and that of road way B is 200 m.

The ratio of their resistances  $R_A : R_B$  is

**Options :**

1. ✔ 1: 2

2. ✖ 1: 4

3. ✖ 1: 3

4. ✖ 1: 9

**Question Number : 140 Question Id : 89040115752 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Three road ways A, B and C are connected in parallel and are having same cross-sectional area and surface characteristics. But length of three roadways are 100 m , 200m and 300 m respectively.

The ratio of Quantity of air flowing through the roadways  $Q_A : Q_B : Q_C$  is

**Options :**

1. ✖ 1: 2: 3

2. ✖ 1:  $\sqrt{2}$ :  $\sqrt{3}$

3. ✖  $1 : \frac{1}{2} : \frac{1}{3}$

4. ✔  $1 : \frac{1}{\sqrt{2}} : \frac{1}{\sqrt{3}}$

Question Number : 141 Question Id : 89040115753 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the type of centrifugal fan having non-over loading power characteristics

Options :

1. ✖ Forward bladed centrifugal fan

2. ✖ Radial bladed centrifugal fan

3. ✔ Backward bladed centrifugal fan

4. ✖ Axial flow fan

Question Number : 142 Question Id : 89040115754 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The composition of Black damp is

Options :

1. ✔  $\text{CO}_2 + \text{N}_2$

2. ✖  $\text{CO}_2 + \text{H}_2$

3. ✖  $\text{CO}_2 + \text{CO}$

4. ✖  $\text{CO}_2 + \text{CH}_4$

Question Number : 143 Question Id : 89040115755 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Abnormal change in barometric pressure in mine workings indicates

Options :

1. ✖ Spontaneous heating in mines
2. ✖ Accumulation of gasses in workings
3. ✔ Leakage of gasses from goaf areas towards workings
4. ✖ Increase in overall resistance of the mine

Question Number : 144 Question Id : 89040115756 Question Type : MCQ Option Shuffling : No  
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

Options :

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

Question Number : 145 Question Id : 89040115757 Question Type : MCQ Option Shuffling : No

**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. ✓  $\frac{T_u - T_d}{T_u} \times D$

2. ✗  $\frac{T_u + T_d}{T_u} \times D$

3. ✗  $\frac{T_u - T_d}{T_d} \times D$

4. ✗  $\frac{T_u + T_d}{T_d} \times D$

**Question Number : 146 Question Id : 89040115758 Question Type : MCQ Option Shuffling : No**

**Display Question Number : Yes**

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

MSA methanometer works based on the principle of

**Options :**

1. ✗ Formation of gas cap

2. ✓ Wheatstone bridge

3. ✗ Infra-red radiation

4. ✗ Optical Properties



Question Number : 147 Question Id : 89040115759 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following fire extinguisher is not used for quenching of fires involving electrical equipment

Options :

1. ✖ CTC Fire extinguisher
2. ✖ CO<sub>2</sub> Type extinguisher
3. ✖ BCF Fire extinguisher
4. ✔ Foam type extinguisher

Question Number : 148 Question Id : 89040115760 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

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

Options :

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

Question Number : 149 Question Id : 89040115761 Question Type : MCQ Option Shuffling : No Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0



Which one of the following Mine explosions associated with backlash ?

**Options :**

1. ✓ Fire damp explosion
2. ✗ Coal dust explosion
3. ✗ Spontaneous heating of coal
4. ✗ Black damp explosion

**Question Number : 150 Question Id : 89040115762 Question Type : MCQ Option Shuffling : No 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 %

**Question Number : 151 Question Id : 89040115763 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

What is the commonly used material for stone dusting in mining operation?

**Options :**

1. ✓ Limestone

- 2. ✖ Granite
- 3. ✖ Sandstone
- 4. ✖ Marble

**Question Number : 152 Question Id : 89040115764 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

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

**Options :**

- 1. ✖ Smoke helmet
- 2. ✖ SCBA
- 3. ✖ Self-Rescuer
- 4. ✔ Reviving apparatus

**Question Number : 153 Question Id : 89040115765 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The most important constituents in Gas mask is

**Options :**

- 1. ✖ Charcoal
- 2. ✖ Silica gel

3. ✖ Caustic soda

4. ✔ Hopcolite

**Question Number : 154 Question Id : 89040115766 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The disease caused due to inhalation of Iron dust is

**Options :**

1. ✖ Silicosis

2. ✔ Siderosis

3. ✖ Asbestosis

4. ✖ Ancylostomiasis

**Question Number : 155 Question Id : 89040115767 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The principle of working of Konimeter dust sampler is

**Options :**

1. ✖ Thermal precipitation

2. ✖ Gravity

3. ✔ Inertia precipitation

4. ✖ Optical method

**Question Number : 156 Question Id : 89040115768 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The process of inducing artificial respiration in a person who is unconscious and whose rate of breathing become considerably feeble is

**Options :**

1. ✖ Rescue operation with SCBA
2. ✖ Reviving operation
3. ✔ Resuscitation
4. ✖ Recovery operation

**Question Number : 157 Question Id : 89040115769 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

In an area to be surveyed the line which covers entire area to be surveyed and has to be measured very accurately is

**Options :**

1. ✔ Base line
2. ✖ Off sets
3. ✖ Check lines
4. ✖ Tie lines

**Question Number : 158 Question Id : 89040115770 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

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

**Options :**

1. ✖  $200 \text{ m}^2$
2. ✖  $2000 \text{ m}^2$
3. ✖  $100 \text{ m}^2$
4. ✔  $1000 \text{ m}^2$

**Question Number : 159 Question Id : 89040115771 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Given scale on a map is  $1 \text{ cm} = 20\text{m}$  then its Representative Factor (RF) is

**Options :**

1. ✖ 1: 1000
2. ✖ 1: 1500
3. ✔ 1: 2000
4. ✖ 1: 2500

**Question Number : 160 Question Id : 89040115772 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In Tachometry value of additive constant will become zero with the addition of

**Options :**

1. ✖ Objective glass

2. ✓ Analytic lens

3. ✗ Focusing glass

4. ✗ Stadia diaphragm

Question Number : 161 Question Id : 89040115773 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The WCB of a line is  $236^0$  then its QB is

Options :

1. ✗  $N56^0 E$

2. ✗  $S 56^0 E$

3. ✓  $S 56^0 W$

4. ✗  $N 56^0 W$

Question Number : 162 Question Id : 89040115774 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The QB of a line is  $S 30^0 20' E$  then its WCB is

Options :

1. ✓  $149^0 40'$

2. ✗  $30^0 20'$

3. ✗

329° 40'

4. ✖ 210° 20'

**Question Number : 163 Question Id : 89040115775 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The bearing of a line is 48° 20' 30". The declination of the location is 2° 30' E.

The direction of true north is

**Options :**

1. ✖ 45° 50' 30"

2. ✔ 50° 50' 30"

3. ✖ 45° 50' 20"

4. ✖ 50° 50' 20"

**Question Number : 164 Question Id : 89040115776 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

A closed traverse of sides ABCDEF. The sum of interior angles of the traverse is

**Options :**

1. ✖ 630°

2. ✖ 540°

3. ✔ 720°

4. ✖ 450°

**Question Number : 165 Question Id : 89040115777 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The levelling method in which correction for curvature and refraction can be eliminated is

**Options :**

1. ✖ Simple levelling
2. ✖ Compound Levelling
3. ✖ Differential levelling
4. ✔ Reciprocal Levelling

**Question Number : 166 Question Id : 89040115778 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The method of setting out curve in underground road ways is

**Options :**

1. ✖ Chord and off set method
2. ✔ Chord and angle method
3. ✖ Tangent and off set method
4. ✖ Two theodolite method

**Question Number : 167 Question Id : 89040115779 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**



The wire ropes which offers better wearing surface and more resistance to bending fatigue is

**Options :**

1. ✓ Lang's Lay
2. ✗ Ordinary lay
3. ✗ Left hand Lay
4. ✗ Right hand Lay

**Question Number : 168 Question Id : 89040115780 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The type of wire ropes used as Guide ropes in winding is

**Options :**

1. ✗ Stranded rope with FC
2. ✓ Non stranded rope
3. ✗ Stranded rope with steel wire core
4. ✗ IWRC

**Question Number : 169 Question Id : 89040115781 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The method of joining of two wire ropes permanently without using special fittings or attachments is known as

**Options :**

1. ✖ Capping
2. ✖ Recapping
3. ✔ Splicing
4. ✖ Socketing

**Question Number : 170 Question Id : 89040115782 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

How many times winding rope has to be recapped through out its life as per regulation ?

**Options :**

1. ✖ 5 times
2. ✔ 6 times
3. ✖ 7 times
4. ✖ 8 times

**Question Number : 171 Question Id : 89040115783 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The torques on the winding drum due to loaded and empty cage can be balanced as far as practicable by

**Options :**

1. ✔ Balancing rope
2. ✖ Use of suitable drum

3. ✖ Changing the load on two cages

4. ✖ Controlling the speed

**Question Number : 172 Question Id : 89040115784 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In drum winding the shaft fitting used for smooth transfer of load between the cages and winding ropes during loading and unloading operation is

**Options :**

1. ✖ Guides

2. ✖ Lilly controller

3. ✖ Safety hook

4. ✔ Keps

**Question Number : 173 Question Id : 89040115785 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The type of haulage system used in case of undulating roadways

**Options :**

1. ✖ Direct rope haulage

2. ✖ Endless rope haulage

3. ✔ Main and Tail rope haulage

4. ✖ Gravity rope haulage

**Question Number : 174 Question Id : 89040115786 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

Identify the safety device used in endless rope haulage system

**Options :**

1. ✖ Back stay

2. ✖ Small man clip

3. ✖ Cam clip

4. ✔ Monkey catch

**Question Number : 175 Question Id : 89040115787 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The type of locomotive containing exhaust conditioner box along with flame trap arrangement is

**Options :**

1. ✔ Diesel locomotive

2. ✖ Battery locomotive

3. ✖ Trolley wire locomotive

4. ✖ Steam locomotive

Question Number : 176 Question Id : 89040115788 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

In a turbine pump the direction of End Thrust is

Options :

1. ✖ In the middle of the pump
2. ✖ From suction end towards delivery end
3. ✔ From delivery end towards Suction end
4. ✖ Any where on the shaft of Turbine pump

Question Number : 177 Question Id : 89040115789 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The reverse direction rotation of Belt conveyor can be prevented by

Options :

1. ✔ Hold back
2. ✖ Stop back
3. ✖ Back stay
4. ✖ Pull chord

Question Number : 178 Question Id : 89040115790 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

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

In Longwall face machinery Shearer is mounted on

**Options :**

1. ✖ Skid
2. ✔ AFC
3. ✖ Hydraulic rams
4. ✖ Double acting piston

**Question Number : 179 Question Id : 89040115791 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The type of Subsidence in which maximum subsidence occurs over an area is known as

**Options :**

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

**Question Number : 180 Question Id : 89040115792 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In opencast blasting the purpose of sub-grade drilling is

**Options :**

1. ✔

To avoid the formation of toe

- 2. ✖ To reduce ground vibrations
- 3. ✖ To reduce consumption of explosive
- 4. ✖ To improve over all blasting performance

**Question Number : 181 Question Id : 89040115793 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which one of the following is NOT a Controlled blasting technique used in Opencast mines ?

**Options :**

- 1. ✖ Pre splitting
- 2. ✖ Deck charging
- 3. ✖ Cushion blasting
- 4. ✔ Cast blasting

**Question Number : 182 Question Id : 89040115794 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

In an opencast bench two geologically disturbed planes intersect each other.  
The type of bench failures likely to takes place

**Options :**

- 1. ✖ Circular failure



2. ✓ Wedge failure

3. ✗ Planar failure

4. ✗ Toppling failure

**Question Number : 183 Question Id : 89040115795 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The strain measuring device used to measure the convergence between the roof and floor at a remote location of a mine is

**Options :**

1. ✗ Tell tale bore hole extensometer

2. ✗ Magnetic ring multipoint bore hole extensometer

3. ✓ Remote convergence recorder

4. ✗ Load cells

**Question Number : 184 Question Id : 89040115796 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In opencast mine planning the report which assess the periodical impact of mining over environment and suggest corresponding control measures is

**Options :**

1. ✓ EIA

2. ✗ EMP



3. ✖ DPR

4. ✖ Feasibility Report

**Question Number : 185 Question Id : 89040115797 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The value of Shear stress along principal plane of a failure surface is

**Options :**

1. ✖ Minimum

2. ✖ Maximum

3. ✖ Neither maximum nor minimum

4. ✔ Zero

**Question Number : 186 Question Id : 89040115798 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The Indirect method of determination of Tensile strength of a rock specimen is

**Options :**

1. ✖ Confined Compressive strength test

2. ✖ Un-Confined compressive strength test

3. ✔ Brazilian test

4. ✖

## Protodyaknov Strength Index

Question Number : 187 Question Id : 89040115799 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

Which one of the following term NOT related to opencast mining ?

Options :

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

Question Number : 188 Question Id : 89040115800 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes

Correct Marks : 1 Wrong Marks : 0

The relation between porosity ( $n$ ) and void ratio ( $e$ ) of a rock specimen is

Options :

1. ✔  $e = \frac{n}{1-n}$
2. ✖  $e = \frac{n}{1+n}$
3. ✖  $e = \frac{1-n}{n}$
4. ✖  $e = \frac{1+n}{n}$

Question Number : 189 Question Id : 89040115801 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The following are the various parameters of the Shovel

Capacity of the bucket –  $20 \text{ m}^3$

Fill factor ( $f$ ) = 0.8

Swell factor ( $s$ ) = 0.5

Cycle time ( $t$ ) = 60 sec

The Volume of the material carried by the Shovel per hour is

Options :

1. ✗  $300 \text{ m}^3$

2. ✗  $388 \text{ m}^3$

3. ✗  $400 \text{ m}^3$

4. ✓  $480 \text{ m}^3$

Question Number : 190 Question Id : 89040115802 Question Type : MCQ Option Shuffling : No  
Display Question Number : Yes  
Correct Marks : 1 Wrong Marks : 0

The width of the haul road in an opencast mine depends on

Options :

1. ✗ Length of the dumper

2. ✓ Width of the largest vehicle moving along haul road

3. ✗ Number of dumpers moving

4. ✗ Targeted production

**Question Number : 191 Question Id : 89040115803 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The place of Drinking water facility on the surface of mine should be away from urinals, latrine and washing places at least at a distance of

**Options :**

- 1. ✓ 6m
- 2. ✗ 5 m
- 3. ✗ 7 m
- 4. ✗ 4 m

**Question Number : 192 Question Id : 89040115804 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Quorum of a Committee meeting as per Mines Act-1952 is

**Options :**

- 1. ✗ 3 Members including Chairmen
- 2. ✗ 3 Members excluding Chairmen
- 3. ✓ 4 Members including Chairmen
- 4. ✗ 4 Members excluding Chairmen

**Question Number : 193 Question Id : 89040115805 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The meaning of term 'misfire' as per regulations is

**Options :**

1. ✖ Failure of ignition of explosive
2. ✖ Improper ignition of explosive
3. ✔ Failure to explode entire charge of Explosive
4. ✖ Failure to explode part of an explosive

**Question Number : 194 Question Id : 89040115806 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The value of Bending factor of rope used in winding as per CMR-2017 is

**Options :**

1. ✔ 100
2. ✖ 120
3. ✖ 80
4. ✖ 150

**Question Number : 195 Question Id : 89040115807 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

The process of setting goals and establishing guide lines to fulfil them is called

**Options :**

1. ✔

Planning

2. ✖ Supervising

3. ✖ Evaluating

4. ✖ Managing

**Question Number : 196 Question Id : 89040115808 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In CPM method of network analysis the Critical activities are associated with

**Options :**

1. ✖ Maximum Float

2. ✖ Minimum Float

3. ✖ Negative Float

4. ✔ Zero Float

**Question Number : 197 Question Id : 89040115809 Question Type : MCQ Option Shuffling : No Display Question Number : Yes**

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

In a PERT network for an activity Pessimistic, Most likely, and Optimistic times are 8 days, 6 days

and 4 days respectively. The expected duration of the activity is \_\_

**Options :**

1. ✔ 6 days

2. ✖ 2 days

3. ✖ 8 days

4. ✖ 9 days

**Question Number : 198 Question Id : 89040115810 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

The time by which activity completion time can be delayed without affecting start of succeeding activity

**Options :**

1. ✖ Duration

2. ✔ Free float

3. ✖ Total float

4. ✖ Interfering float

**Question Number : 199 Question Id : 89040115811 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

Which one of the following is a principle of TQM ?

**Options :**

1. ✖ Product-Centred system

2. ✖ Intermittent improvement



3. ✓ Customer-focus

4. ✗ Decision made by top executives

**Question Number : 200 Question Id : 89040115812 Question Type : MCQ Option Shuffling : No Display Question Number : Yes Correct Marks : 1 Wrong Marks : 0**

For a person working in Opencast mine the rate at which leave with wages calculated is

**Options :**

1. ✗ One day for every 15 days of work performed by him

2. ✓ One day for every 20 days of work performed by him

3. ✗ One day for every 10 days of work performed by him

4. ✗ One day for every 30 days of work performed by him.