

**Telangana State Council of Higher Education**

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



Date of Examination: 09-05-2018

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

**Master Question Paper Copy**

**Chemical Engineering**

**Notations :**

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

Question Number : 1 Question Id : 5105295413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

**Options :**

1.  9
2.  16
3.  3
4.  4

Question Number : 2 Question Id : 5105295414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

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

Question Number : 3 Question Id : 5105295415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

matrices, then  $P - Q =$

Options :

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

Question Number : 4 Question Id : 5105295416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔  $x = -2, y = 2$

2. ✖  $x = -2, y = -2$

3. ✖  $x = 2, y = 2$

4. ✖  $x = 2, y = -2$

Question Number : 5 Question Id : 5105295417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✖ 2

2. ✖ 3

3. ✖ 4

4. ✔ 5

Question Number : 6 Question Id : 5105295418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ -2

Question Number : 7 Question Id : 5105295419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :



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

1. ✘

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

2. ✘

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

3. ✔

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

4. ✘

Question Number : 8 Question Id : 5105295420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

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

1. ✘

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

2. ✘

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

3. ✘

does not exist.

4. ✔

Question Number : 9 Question Id : 5105295421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



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

Options :

1. ✘  $[-2, 0]$

2. ✘  $(-2, 0)$

3. ✘  $[-2, 0)$

4. ✔  $(-2, 0]$

Question Number : 10 Question Id : 5105295422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\Delta$

2. ✘  $\frac{1}{R}$

3. ✔  $\frac{r}{R}$

4. ✘  $\frac{\Delta}{R}$

Question Number : 11 Question Id : 5105295423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔ 11

2. ✘ 36

3. ✘ 27

4. ✘ 10

Question Number : 12 Question Id : 5105295424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

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

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

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

Question Number : 13 Question Id : 5105295425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔  $\tan^{-1} \frac{23}{61}$

2. ✘  $\tan^{-1} \frac{14}{61}$

3. ✘  $\tan^{-1} \frac{32}{61}$

4. ✘  $\tan^{-1} \frac{3}{51}$

Question Number : 14 Question Id : 5105295426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{1}{2}$

2. ✘  $\frac{1}{4}$

3. ✔  $\frac{1}{8}$

4. ✘ 1

Question Number : 15 Question Id : 5105295427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{1}{4} \sin A$

2. ✔  $\frac{1}{4} \sin 3A$

3. ✘  $\frac{1}{4} \cos A$

4. ✘  $\frac{1}{4} \cos 3A$

Question Number : 16 Question Id : 5105295428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\sin 30^\circ$



2. ✓  $\sin 35^\circ$

3. ✗  $\sin 45^\circ$

4. ✗  $\sin 55^\circ$

Question Number : 17 Question Id : 5105295429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✗  $n + m = 2$

2. ✗  $n = m$

3. ✗  $n = 2m$

4. ✓  $n = 4m$

Question Number : 18 Question Id : 5105295430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✗  $3x + 4y + 18 = 0$

2. ✓  $3x + 4y - 18 = 0$

3. ✗  $3x - 4y - 18 = 0$

4. ✗  $3x - 4y + 18 = 0$

Question Number : 19 Question Id : 5105295431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{1}{\sqrt{5}}$

2. ✘  $\frac{2}{\sqrt{5}}$

3. ✘  $\frac{3}{\sqrt{5}}$

4. ✔  $\frac{4}{\sqrt{5}}$

Question Number : 20 Question Id : 5105295432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ (-1, -2)

2. ✘ (1, 2)

3. ✘ (2, 1)

4. ✔ (2, 2)

Question Number : 21 Question Id : 5105295433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ Differentiable at x=0

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

Question Number : 22 Question Id : 5105295434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 23 Question Id : 5105295435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 24 Question Id : 5105295436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



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

Options :

1. ✘ 0

2. ✘  $2Z$

3. ✔ 1

4. ✘  $\frac{Z}{2}$

Question Number : 25 Question Id : 5105295437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔  $V\sqrt{2}$

2. ✘  $\frac{V}{\sqrt{2}}$

3. ✘  $\frac{\sqrt{2}}{V}$

4. ✘  $2V^2$

Question Number : 26 Question Id : 5105295438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{\cos x^2}{5x^4}$

2. ✘  $\frac{2 \cos x^2}{5x^4}$

3. ✔  $\frac{2 \cos x^2}{5x^3}$

4. ✘  $\frac{2 \sin x^2}{5x^4}$

Question Number : 27 Question Id : 5105295439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{y}{x(1-y \log x)}$

2. ✔  $\frac{y^2}{x(1-y \log x)}$

3. ✘  $\frac{y^2}{x(1+y \log x)}$

4. ✘  $\frac{y}{(1-y \log x)}$

Question Number : 28 Question Id : 5105295440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $-\frac{1}{t^2}$

2. ✘  $-\frac{1}{2at}$

3. ✔  $-\frac{1}{2at^2}$

4. ✘  $-\frac{1}{2at^4}$

Question Number : 29 Question Id : 5105295441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 0

2. ✔  $\frac{I_1}{2}$

3. ✘  $\frac{I_1}{3}$

4. ✘  $2I_1$

Question Number : 30 Question Id : 5105295442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $2/7$

2. ✘  $1/3$

3. ✘  $-2/5$

4. ✔  $2/15$



Question Number : 31 Question Id : 5105295443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{5}{4}$

2. ✘  $\frac{5}{3}$

3. ✔  $\frac{5}{6}$

4. ✘  $\frac{5}{2}$

Question Number : 32 Question Id : 5105295444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{1}{x} + c$

2. ✔  $x + c$

3. ✘  $2x + c$

4. ✘  $\frac{2}{x} + c$

Question Number : 33 Question Id : 5105295445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

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

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

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

Question Number : 34 Question Id : 5105295446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $-\frac{1}{xe^x} + C$

2. ✘  $\frac{1}{xe^x} + C$

3. ✔  $-\frac{1}{x}e^x + C$

4. ✘  $xe^x + C$

Question Number : 35 Question Id : 5105295447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔  $\frac{\pi}{4}$

2. ✘  $\frac{\pi}{6}$

3. ✘  $\frac{\pi}{8}$

4. ✘  $\pi$

Question Number : 36 Question Id : 5105295448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{\pi}{12}$

2. ✔  $\frac{\pi}{32}$

3. ✘  $\frac{\pi}{42}$

4. ✘  $\frac{\pi}{2}$

Question Number : 37 Question Id : 5105295449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $y = x^3 + cx$

2. ✔  $x = y^3 + cy$

3. ✘  $x = y^2 + cy$

4. ✘  $y = x^3 + cy^2$

Question Number : 38 Question Id : 5105295450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



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

Options :

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

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

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

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

Question Number : 39 Question Id : 5105295451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ Order 3

2. ✘ Order 2

3. ✔ degree 3

4. ✘ degree 1

Question Number : 40 Question Id : 5105295452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✘  $x y' = 1$

2. ✘  $x y'' = 0$

3. ✔  $y'' = 0$

4. ✘  $y'' = 1$

Question Number : 41 Question Id : 5105295453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

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

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

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

Question Number : 42 Question Id : 5105295454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $c x + y + (1 - \log x) = 0$

2. ✔  $c x - y - (1 + \log x) = 0$

3. ✘  $c y + x + \log x - 1 = 0$

4. ✘  $c x - y + (1 + \log x) = 0$



Question Number : 43 Question Id : 5105295455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 44 Question Id : 5105295456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 45 Question Id : 5105295457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✗  $\frac{1}{(s+2)^3}$



2. ✓  $\frac{2}{(s+2)^3}$

3. ✗  $\frac{1}{(s+2)^2}$

4. ✗  $\frac{2}{(s+2)^2}$

Question Number : 46 Question Id : 5105295458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✗  $\frac{2\pi^2}{3}$

2. ✓  $\frac{\pi^2}{3}$

3. ✗  $\frac{4\pi^2}{3}$

4. ✗  $\frac{5\pi^2}{3}$

Question Number : 47 Question Id : 5105295459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✗ 0

2. ✓  $\frac{-32}{\pi^2}$

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

4. ✗  $\frac{16}{\pi^2}$

Question Number : 48 Question Id : 5105295460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✗  $F(1)$

2. ✗  $F(\infty)$

3. ✓  $F(0)$

4. ✗  $F(S-1)$

Question Number : 49 Question Id : 5105295461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✓ 52.8

2. ✗ 54.8

3. ✗ 53.8

4. ✗ 51.8

Question Number : 50 Question Id : 5105295462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\frac{7}{14}$

2. ✔  $\frac{9}{14}$

3. ✘  $\frac{8}{14}$

4. ✘  $\frac{10}{14}$

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 51 Question Id : 5105295463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $M L T^{-1}$

2. ✘  $M L^{-1} T^{-1}$

3. ✔  $M L^2 T^{-1}$

4. ✘  $M^1 L^2 T^{-2}$

Question Number : 52 Question Id : 5105295464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



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

Options :

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

Question Number : 53 Question Id : 5105295465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 54 Question Id : 5105295466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 3
2. ✔ 1
3. ✘ 4
4. ✘ 2

Question Number : 55 Question Id : 5105295467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ -2

2. ✘ 8

3. ✘ -7

4. ✔ -8

Question Number : 56 Question Id : 5105295468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 9.8 N

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

3. ✘  $9.8 \times \sqrt{3}$  N

4. ✘  $0.7 \times 0.9$  N

Question Number : 57 Question Id : 5105295469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 1 second



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

Question Number : 58 Question Id : 5105295470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 59 Question Id : 5105295471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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



Question Number : 60 Question Id : 5105295472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 61 Question Id : 5105295473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 62 Question Id : 5105295474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✘  $K^2/r$

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

Question Number : 63 Question Id : 5105295475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 64 Question Id : 5105295476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 65 Question Id : 5105295477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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



Options :

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

Question Number : 66 Question Id : 5105295478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 67 Question Id : 5105295479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 68 Question Id : 5105295480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



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

Options :

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

Question Number : 69 Question Id : 5105295481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 1
2. ✘ 3
3. ✘ 4
4. ✔ 5

Question Number : 70 Question Id : 5105295482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 71 Question Id : 5105295483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 72 Question Id : 5105295484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 73 Question Id : 5105295485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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



Question Number : 74 Question Id : 5105295486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 75 Question Id : 5105295487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 76 Question Id : 5105295488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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



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

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

Question Number : 77 Question Id : 5105295489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘  $\text{PH}_3$

2. ✘  $\text{H}_2\text{O}$

3. ✔  $\text{NH}_4\text{OH}$

4. ✘  $\text{HBr}$

Question Number : 78 Question Id : 5105295490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ N and O

2. ✔ P and S

3. ✘ F and Cl

4. ✘ N and S

Question Number : 79 Question Id : 5105295491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the following balanced equation



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

Options :

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

Question Number : 80 Question Id : 5105295492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 10
2. ✔ 25
3. ✘ 50
4. ✘ 1

Question Number : 81 Question Id : 5105295493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Arrange the following in the decreasing order of acidity:

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

Options :

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

4. ✘ I > III > II

Question Number : 82 Question Id : 5105295494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which anion is the weakest conjugate base?

Options :

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

2. ✘  $\text{F}^\ominus$

3. ✘  $\text{CH}_3\text{COO}^\ominus$

4. ✔  $\text{NO}_3^\ominus$

Question Number : 83 Question Id : 5105295495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ Electrical

2. ✘ Open hearth

3. ✔ Reverberatory

4. ✘ Blast

Question Number : 84 Question Id : 5105295496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Number of coulombs of current required to convert completely one mole of  $\text{MnO}_4^\ominus$  ions in acid medium to one mole of  $\text{Mn}^{+2}$  ions electrically \_\_\_\_\_

Options :



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

Question Number : 85 Question Id : 5105295497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ Mg
2. ✘ Ca
3. ✔ K
4. ✘ Na

Question Number : 86 Question Id : 5105295498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

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

Options :

1. ✔ +1.10 V
2. ✘ -0.42 V

3. ✘ +0.42 V

4. ✘ -1.10 V

Question Number : 87 Question Id : 5105295499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

is \_\_\_\_\_

Options :

1. ✔ Impressed current cathodic protection

2. ✘ Metal rusting

3. ✘ Tinning

4. ✘ Metal painting

Question Number : 88 Question Id : 5105295500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✔ 1

2. ✘ 2

3. ✘ 3

4. ✘ 4

Question Number : 89 Question Id : 5105295501 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

is \_\_\_\_

Options :

1. ✘ 625

2. ✔ 750

3. ✘ 1500

4. ✘ 25

Question Number : 90 Question Id : 5105295502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

is \_\_\_\_\_

Options :

1. ✘ Ion exchange process

2. ✘ Permutit process

3. ✘ Zeolite process

4. ✔ Reverse osmosis

Question Number : 91 Question Id : 5105295503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The exhausted anion exchange column in the demineralization process is regenerated

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

Options :



1. ✘ dil H<sub>2</sub>SO<sub>4</sub>

2. ✘ dil HCl

3. ✔ dil NaOH

4. ✘ dil NH<sub>4</sub>OH

Question Number : 92 Question Id : 5105295504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ Polythene

2. ✔ Terylene

3. ✘ Neoprene

4. ✘ Polystyrene

Question Number : 93 Question Id : 5105295505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is an example of fibre polymer?

Options :

1. ✘ Rubber

2. ✘ PVC

3. ✘ Bakelite

4. ✔ Nylon-66

Question Number : 94 Question Id : 5105295506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 95 Question Id : 5105295507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 96 Question Id : 5105295508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

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

Options :

1. ✘ Chlorine nitrate

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

Question Number : 97 Question Id : 5105295509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Question Number : 98 Question Id : 5105295510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

1. ✘ 1.5
2. ✔ 15.3
3. ✘ 0.4
4. ✘ 4

Question Number : 99 Question Id : 5105295511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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



Options :

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

Question Number : 100 Question Id : 5105295512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

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

Options :

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

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 101 Question Id : 5105295513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Match the following alloys:

A

- (i) Bronze
- (ii) Brass
- (iii) Gun metal
- (iv) Stainless steel

B

- (a) chromium and nickel
- (b) manganese, phosphorous and nickel
- (c) copper and tin
- (d) copper and zinc

Options :

1. ✘ [(i) -- a; (ii) -- b; (iii) -- c; (iv) -- d]

2. ✔ [(i) -- c; (ii) -- d; (iii) -- b; (iv) -- a]

3. ✘ [(i) -- b; (ii) -- d; (iii) -- c; (iv) -- a]

4. ✘ [(i) -- d; (iii) -- c; (iii) -- b; (iv) -- a]

Question Number : 102 Question Id : 5105295514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Match the following ores:

A

- (i) Galena
- (ii) Chalcopyrite
- (iii) Thorium
- (iv) Uranium

B

- (a) monazite sand
- (b) pitchblende
- (c) lead
- (d) copper

Options :

1. ✔ [(i) -- c; (ii) -- d; (iii) -- a; (iv) -- b]

2. ✘ [(i) -- d; (ii) -- c; (iii) -- a; (iv) -- b]

3. ✘ [(i) -- b; (ii) -- d; (iii) -- a; (iv) -- c]

4. ✘ [(i) -- a; (ii) -- d; (iii) -- c; (iv) -- b]

Question Number : 103 Question Id : 5105295515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Match the following:

A

(i) Caustic soda can be stored in

(ii) Dry chlorine can be handled in a vessel made up of

(iii) Urea autoclave is made of

(iv) hydrochloric acid is stored in

B

(a) iron or steel

(b) stainless steel

(c) rubber lined steel vessel

(d) steel drums

Options :

1. ✘ [(i) -- a; (ii) -- d; (iii) -- b; (iv) -- c]

2. ✘ [(i) -- b; (ii) -- a; (iii) -- d; (iv) -- c]

3. ✔ [(i) -- d; (ii) -- a; (iii) -- b; (iv) -- c]

4. ✘ [(i) -- c; (ii) -- a; (iii) -- b; (iv) -- d]

Question Number : 104 Question Id : 5105295516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The most resistant material to alkaline corrosion is \_\_\_\_\_

Options :

1. ✘ aluminium

2. ✘ duriron



3. ✓ nickel

4. ✗ karbate

Question Number : 105 Question Id : 5105295517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In corrosion control by cathodic protection, the minimum protective current depends \_\_\_\_\_

Options :

1. ✗ only on anode resistance

2. ✗ only on cathode resistance

3. ✗ on the difference between electrode potentials and the anode resistance

4. ✓ on the difference between electrode potentials and the cathode resistance

Question Number : 106 Question Id : 5105295518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Pick out the correct statement:

When chlorine gas attacks tin \_\_\_\_\_

Options :

1. ✗ a thick adherent stannic chloride film is formed

2. ✗ a thin porous stannic chloride film is formed

3. ✓ tin gets converted into volatile stannic chloride

4. ✗ no reaction takes place

Question Number : 107 Question Id : 5105295519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In Orsat apparatus, ammoniacal cuprous chloride is used for selectively absorbing \_\_\_\_\_

Options :

1. ✓ CO
2. ✗ CO<sub>2</sub>
3. ✗ O<sub>2</sub>
4. ✗ H<sub>2</sub>O

Question Number : 108 Question Id : 5105295520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A cylinder contains 35.5 g of liquid chlorine. If chlorine is released and brought to standard conditions, the volume occupied will be \_\_\_\_\_ litres.

Options :

1. ✗ 0.0112
2. ✓ 11.2
3. ✗ 11200
4. ✗ 1.12

Question Number : 109 Question Id : 5105295521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Find the weight percent of NaCl in an aqueous solution of sodium chloride having a molality of 1.80?

Options :

1. ✗ 10.53%
2. ✓ 9.53%
3. ✗ 8.53%
4. ✗ 11.53%



Question Number : 110 Question Id : 5105295522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

A natural gas has the following composition in volume percent:

Methane 83.5%

Ethane 12.5%

Nitrogen 4%

Average molecular weight is \_\_\_\_\_

Options :

1. ✘ 100 g
2. ✔ 18.23 g
3. ✘ 1823 g
4. ✘ 1.823 g

Question Number : 111 Question Id : 5105295523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Percentage ratio of partial pressure of vapour to the vapour pressure of the liquid at  
the existing temperature is called \_\_\_\_\_

Options :

1. ✘ percentage saturation
2. ✘ mole fraction
3. ✘ weight fraction
4. ✔ relative saturation

Question Number : 112 Question Id : 5105295524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Percentage of excess air for combustion depends upon the:

Options :



1. ✓ type of fuel
2. ✗ calorific value of the fuel
3. ✗ sulphur content of the fuel
4. ✗ ignition temperature of the fuel

Question Number : 113 Question Id : 5105295525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Consider the five gases namely methane, ethane, propane, butane and pentane. Write them in the order of increasing total heating value:

Options :

1. ✗ pentane, butane, propane, ethane and methane
2. ✓ methane, ethane, propane, butane and pentane
3. ✗ propane, butane, ethane, methane and pentane
4. ✗ pentane, butane, ethane, propane and methane

Question Number : 114 Question Id : 5105295526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An aqueous solution contains 28% NaOH by weight. Corresponding composition in mole percent is \_\_\_\_\_

Options :

1. ✓ 15%
2. ✗ 85%
3. ✗ 10%
4. ✗ 20%

Question Number : 115 Question Id : 5105295527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Consider the four series of compounds namely, paraffins, naphthenes, olefins and aromatics. Which of the following is correct in the increasing order of hydrogen content?

Options :

1. ✘ Paraffins, naphthenes, olefins and aromatics
2. ✘ Naphthenes, paraffins, olefins, aromatics
3. ✘ Aromatics, naphthenes, paraffins, olefins
4. ✔ Aromatics, olefins, naphthenes, paraffins

Question Number : 116 Question Id : 5105295528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Consider the four types of coals, coke, anthracite, semi-bituminous, bituminous.

Which of the following is correct in the increasing order of heating value?

Options :

1. ✔ coke, anthracite, semi-bituminous, bituminous
2. ✘ bituminous, semi-bituminous, anthracite, coke
3. ✘ anthracite, coke, semi-bituminous, bituminous
4. ✘ semi-bituminous, bituminous, anthracite, coke

Question Number : 117 Question Id : 5105295529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Catalyst used in hydrogenation of oil is \_\_\_\_\_

Options :

1. ✔ nickel
2. ✘ platinum
3. ✘ iron



4. ✘ alumina

Question Number : 118 Question Id : 5105295530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is a detergent?

Options :

1. ✘ fatty alcohol
2. ✔ alkyl benzene sulphonate
3. ✘ fatty acids
4. ✘ methylene chloride

Question Number : 119 Question Id : 5105295531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Bleaching of paper pulp is done with \_\_\_\_\_

Options :

1. ✘ activated clay
2. ✘ bromine
3. ✔ chlorine or chlorine dioxide
4. ✘ magnesium sulphite

Question Number : 120 Question Id : 5105295532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Trinitrotoluene (TNT), an explosive is made by nitration of \_\_\_\_\_

Options :

1. ✘ nitrobenzene
2. ✔ toluene
3. ✘ nitrotoluene
4. ✘ benzene



Question Number : 121 Question Id : 5105295533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following fuel gases contains maximum amount of carbon monoxide?

Options :

1. ✘ coke oven gas
2. ✘ water gas
3. ✘ blast furnace gas
4. ✔ LD Converter gas

Question Number : 122 Question Id : 5105295534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Phenol formaldehyde \_\_\_\_\_

Options :

1. ✘ employs addition polymerization
2. ✔ employs condensation polymerization
3. ✘ is a monomer
4. ✘ is an abrasive material

Question Number : 123 Question Id : 5105295535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Match the following with reference to catalyst used:

A	B
(i) ZnO	(a) catalytic cracking
(ii) Nickel	(b) water gas shift reaction
(iii) iron oxide	(c) fat splitting
(iv) silica alumina	(d) steam hydrocarbon reforming

Options :

1. ✘ [ (i) -- d; (ii) --- c; (iii) -- b; (iv) --- a]
2. ✘ [ (i) -- a; (ii) --- d; (iii) -- b; (iv) --- c]
3. ✘ [ (i) -- b; (ii) --- d; (iii) -- c; (iv) --- a]
4. ✔ [ (i) -- c; (ii) --- d; (iii) -- b; (iv) --- a]

Question Number : 124 Question Id : 5105295536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Fermenter temperature during production of alcohol from molasses is around \_\_\_\_\_

Options :

1. ✘ 5 °C
2. ✔ 30 °C
3. ✘ 140 °C
4. ✘ 310 °C

Question Number : 125 Question Id : 5105295537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

\_\_\_\_\_ stimulates early growth and accelerates seeding or fruit formation in later stages of growth.

Options :

1. ✘ nitrogen
2. ✘ potassium
3. ✔ phosphorous
4. ✘ sodium

Question Number : 126 Question Id : 5105295538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Gypsum is \_\_\_\_\_

Options :

1. ✘ calcium chloride
2. ✘ potassium sulphate
3. ✘ sodium sulphate
4. ✔ calcium sulphate

Question Number : 127 Question Id : 5105295539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Frasch process is for \_\_\_\_\_

Options :

1. ✘ making oxygen
2. ✘ producing helium
3. ✔ mining sulphur
4. ✘ making nitrogen

Question Number : 128 Question Id : 5105295540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Most widely used coagulant for removal of suspended impurities in water is \_\_\_\_\_

Options :

1. ✘ bleaching powder
2. ✔ alum
3. ✘ slaked lime
4. ✘ copper sulphate

Question Number : 129 Question Id : 5105295541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

DCDA process is for the manufacturing of \_\_\_\_\_



Options :

1. ✘ nitric acid
2. ✘ phosphoric acid
3. ✔ sulphuric acid
4. ✘ ammonium sulphate

Question Number : 130 Question Id : 5105295542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Fire clay is \_\_\_\_\_

Options :

1. ✘ a basic refractory material
2. ✔ an acidic refractory material
3. ✘ a neutral refractory material
4. ✘ not a refractory material

Question Number : 131 Question Id : 5105295543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The adverse factor challenging the choice of mercury electrolytic cell process for the  
production of NaOH is \_\_\_\_\_

Options :

1. ✘ high cost of mercury
2. ✘ high specific gravity of mercury
3. ✘ non-availability of high purity mercury
4. ✔ pollution of water stream by mercury

Question Number : 132 Question Id : 5105295544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In reverse osmosis process, the operating pressure is \_\_\_\_\_

Options :

1. ✓ greater than osmotic pressure
2. ✗ lower than osmotic pressure
3. ✗ equal to osmotic pressure
4. ✗ not related to osmotic pressure

Question Number : 133 Question Id : 5105295545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a fluidized bed reactor using uniformly sized particles

Options :

1. ✗ temperature gradients are very high
2. ✓ temperature is more or less uniform
3. ✗ hot spots will be formed
4. ✗ segregation of particles occurs

Question Number : 134 Question Id : 5105295546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Velocity profile for a Newtonian fluid flowing in a closed conduit is \_\_\_\_\_

Options :

1. ✗ logarithmic
2. ✓ parabolic
3. ✗ hyperbolic
4. ✗ linear

Question Number : 135 Question Id : 5105295547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical



Priming is needed in a \_\_\_\_\_

Options :

1. ✘ reciprocating pump
2. ✘ gear pump
3. ✔ centrifugal pump
4. ✘ diaphragm pump

Question Number : 136 Question Id : 5105295548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Forces acting on a particle settling in a fluid are \_\_\_\_\_

Options :

1. ✘ gravitational and buoyant forces
2. ✘ centrifugal and drag forces
3. ✔ gravitational, buoyant and drag forces
4. ✘ external, drag and viscous forces

Question Number : 137 Question Id : 5105295549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following facilitates closes control of flow of fluids?

Options :

1. ✘ gate valve
2. ✔ globe valve
3. ✘ butterfly valve
4. ✘ check valve

Question Number : 138 Question Id : 5105295550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Differential manometer is \_\_\_\_\_

Options :

1. ✘ used to measure atmospheric pressure
2. ✘ used to measure sub-atmospheric pressure
3. ✔ used to measure pressure difference between two points
4. ✘ not used for pressure measurement

Question Number : 139 Question Id : 5105295551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Equation of continuity for an incompressible fluid is:

Options :

1. ✘  $\frac{\partial \rho}{\partial t} + \nabla \cdot \rho v = 0$
2. ✘  $\frac{D\rho}{Dt} + \rho \nabla \cdot v = 0$
3. ✔  $\nabla \cdot v = 0$
4. ✘  $\frac{D\rho}{Dt} + \nabla \cdot v = 0$

Question Number : 140 Question Id : 5105295552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Vena contracta forms in \_\_\_\_\_

Options :

1. ✘ venturi meter
2. ✔ orifice meter
3. ✘ rotameter
4. ✘ pitot tube

Question Number : 141 Question Id : 5105295553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Thermal diffusivity is \_\_\_\_\_

Options :



1. ✓  $\frac{k}{c_p \rho}$

2. ✗  $\frac{c_p \rho}{k}$

3. ✗  $\frac{c_p k}{\rho}$

4. ✗  $\frac{\rho k}{c_p}$

Question Number : 142 Question Id : 5105295554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Natural convection is characterized by \_\_\_\_\_

Options :

1. ✓ Grashhoff number

2. ✗ Peclet number

3. ✗ Reynolds number

4. ✗ Prandtl number

Question Number : 143 Question Id : 5105295555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Dietus-Boelter equation for determination of heat transfer coefficient is valid:

Options :

1. ✗ for fluids flowing in laminar flow

2. ✓ for fluids flowing turbulent flow

3. ✗ when Grashhoff number is very important

4. ✗ for liquid metals

Question Number : 144 Question Id : 5105295556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Pick out the correct equation:

Options :

1. ✘  $J_H = (St)(Pr)^{\frac{1}{2}} = \frac{f}{2}$

2. ✔  $J_H = (St)(Pr)^{\frac{2}{3}} = \frac{f}{2}$

3. ✘  $J_H = (St)^{\frac{2}{3}}(Pr) = \frac{f}{2}$

4. ✘  $J_H = (St)^{\frac{1}{3}}(Pr) = \frac{f}{2}$

Question Number : 145 Question Id : 5105295557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Heat transfer coefficient in film type condensation is \_\_\_\_\_

Options :

1. ✔ lower than that for dropwise condensation

2. ✘ same as that for dropwise condensation

3. ✘ greater than that for dropwise condensation

4. ✘ half that for dropwise condensation

Question Number : 146 Question Id : 5105295558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Heat sensitive materials can be concentrated in an evaporator employing \_\_\_\_\_

Options :

1. ✔ vacuum

2. ✘ high pressure

3. ✘ high residence time

4. ✘ multistaging



Question Number : 147 Question Id : 5105295559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In a feed forward multiple effect evaporator, the pressure is \_\_\_\_\_

Options :

1. ✘ the highest in last effect
2. ✔ the lowest in last effect
3. ✘ the same in all effects
4. ✘ dependent on the number of effects

Question Number : 148 Question Id : 5105295560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Air is best heated with steam in a heat exchanger of \_\_\_\_\_

Options :

1. ✘ plate type
2. ✘ double pipe type with fins on steam side
3. ✔ double pipe type with fins on air side
4. ✘ shell and tube type

Question Number : 149 Question Id : 5105295561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

One kilogram of water at  $0^{\circ}\text{C}$  is changed to superheated steam of 1 atm pressure and  $200^{\circ}\text{C}$ . The major heat consumption in the process will be \_\_\_\_\_

Options :

1. ✘ to heat the water from  $0^{\circ}\text{C}$  to  $100^{\circ}\text{C}$
2. ✔ to evaporate the water
3. ✘ to superheat the steam
4. ✘ it cannot be predicted

Question Number : 150 Question Id : 5105295562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

To reduce the tube side pressure drop for the same flow rate, the heat exchanger recommended is

Options :

1. ✘ 1-2 heat exchanger
2. ✔ 1-1 heat exchanger
3. ✘ 3-2 heat exchanger
4. ✘ 2-4 heat exchanger

Question Number : 151 Question Id : 5105295563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Shape factor for a cylinder whose length equals to its diameter is \_\_\_\_\_

Options :

1. ✔ 1.5
2. ✘ 1.0
3. ✘ 0.5
4. ✘ 0.25

Question Number : 152 Question Id : 5105295564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Rittinger's crushing law states that \_\_\_\_\_

Options :

work required to form a particle of any size is proportional to the square of the

1. ✘ surface to volume ratio of the product

work required to form a particle of a particular size is proportional to the

2. ✘ squareroot of the surface to volume ratio of the product.



3. ✓ work required in crushing is proportional to the new surface created

for a given machine and feed, crushing efficiency is dependent on the sizes of

4. ✗ feed and product

Question Number : 153 Question Id : 5105295565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For the preliminary breaking of a hard rock, which of the following is used?

Options :

1. ✓ gyratory crusher

2. ✗ ball mill

3. ✗ tube mill

4. ✗ squirrel-cage disintegrator

Question Number : 154 Question Id : 5105295566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In continuous filtration, filtrate flow rate varies inversely to the \_\_\_\_\_

Options :

1. ✓ square root of the velocity

2. ✗ square of the viscosity

3. ✗ filtration time only

4. ✗ washing time only

Question Number : 155 Question Id : 5105295567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The most efficient method for removal of sub-micron dust particles from blast

furnace gas is \_\_\_\_\_

Options :

1. ✗ venturi atomizer

2. ✘ gravity settling chamber
3. ✔ electro-static precipitator
4. ✘ cyclone separator

Question Number : 156 Question Id : 5105295568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The material is crushed in a gyratory crusher by the action of \_\_\_\_\_

Options :

1. ✘ impact
2. ✔ compression
3. ✘ attrition
4. ✘ cutting

Question Number : 157 Question Id : 5105295569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

As the product becomes finer, the energy required for grinding \_\_\_\_\_

Options :

1. ✘ deceases
2. ✔ increases
3. ✘ is same as for coarser grinding
4. ✘ is 1.5 times that for coarser grinding

Question Number : 158 Question Id : 5105295570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For clarification of potable water, which of the following is used?

Options :

1. ✔ gravity sand filter
2. ✘ plate and frame filter



3. ✘ vacuum leaf filter
4. ✘ rotary vacuum filter

Question Number : 159 Question Id : 5105295571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The degrees of freedom for a system comprising of liquid water in equilibrium with its vapor is \_\_\_\_\_

Options :

1. ✘ zero
2. ✔ 1
3. ✘ 4
4. ✘ 3

Question Number : 160 Question Id : 5105295572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For an isothermal reversible compression of an ideal gas is \_\_\_\_\_

Options :

1. ✘ only  $\Delta U = 0$
2. ✘ only  $\Delta H = 0$
3. ✔  $\Delta H = \Delta U = 0$
4. ✘  $dQ = dU$

Question Number : 161 Question Id : 5105295573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An isolated system can exchange \_\_\_\_\_

Options :

1. ✘ energy with its surroundings
2. ✘ matter with its surroundings

3. ✓ neither matter nor energy with its surroundings
4. ✗ both matter and energy with its surroundings

Question Number : 162 Question Id : 5105295574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Second law of thermodynamics is concerned with \_\_\_\_\_

Options :

1. ✗ amount of energy transferred
2. ✓ direction of energy transferred
3. ✗ irreversible processes only
4. ✗ non-cyclic processes only

Question Number : 163 Question Id : 5105295575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

For a zero order reaction, concentration of product increases with \_\_\_\_\_

Options :

1. ✓ increase of reaction time
2. ✗ increase in initial concentration
3. ✗ increase in total pressure
4. ✗ decrease in total pressure

Question Number : 164 Question Id : 5105295576 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Reactions with high activation energy are \_\_\_\_\_

Options :

1. ✓ very temperature sensitive
2. ✗ temperature insensitive



3. ✘ always irreversible
4. ✘ always reversible

Question Number : 165 Question Id : 5105295577 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

With increase in temperature, the equilibrium conversion of a reversible exothermic reaction \_\_\_\_\_

Options :

1. ✔ decreases
2. ✘ increases
3. ✘ remains unaffected
4. ✘ decreases linearly with temperature

Question Number : 166 Question Id : 5105295578 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is most suitable for very high pressure gas-phase reaction?

Options :

1. ✘ batch reactor
2. ✔ tubular flow reactor
3. ✘ stirred tank reactor
4. ✘ fluidized bed reactor

Question Number : 167 Question Id : 5105295579 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

At the condition of azeotropism, relative volatility is \_\_\_\_\_

Options :

1. ✘ less than unity
2. ✘ greater than unity

3. ✓ equal to unity
4. ✗ less than zero

Question Number : 168 Question Id : 5105295580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

When a partial condenser is used in a distillation column, \_\_\_\_\_

Options :

1. ✗ both reflux and distillate will be in vapor form
2. ✓ reflux will be in liquid state, while distillate will be in vapor form
3. ✗ both reflux and distillate will be in liquid state
4. ✗ reflux will be in vapor state and distillate will be in liquid state

Question Number : 169 Question Id : 5105295581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

According to Mc. Cabe Thiele method, if the feed is a mixture of liquid and vapor, the value of  $q$  \_\_\_\_\_

Options :

1. ✗ is zero
2. ✗ is unity
3. ✓ lies between zero and unity
4. ✗ is infinite

Question Number : 170 Question Id : 5105295582 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Falling rate period represents drying of \_\_\_\_\_

Options :

1. ✓ bound moisture
2. ✗ unbound moisture



3. ✘ equilibrium moisture

4. ✘ free moisture

Question Number : 171 Question Id : 5105295583 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Shanks system is used in \_\_\_\_\_

Options :

1. ✘ absorption

2. ✘ liquid extraction

3. ✔ leaching

4. ✘ distillation

Question Number : 172 Question Id : 5105295584 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In gas absorption, the mole fraction of the solute (x) in liquid phase is equal to \_\_\_\_\_

Options :

1. ✘  $X/(1-X)$

2. ✔  $X/(1+X)$

3. ✘  $X/(1-x)$

4. ✘  $X/(1+x)$

Question Number : 173 Question Id : 5105295585 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

If the distribution of solute favours raffinate phase in liquid extraction, the

distribution coefficient will be \_\_\_\_\_

Options :

1. ✘ greater than unity

2. ✔ less than unity

- 3. ✘ equal to unity
- 4. ✘ less than zero

Question Number : 174 Question Id : 5105295586 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Flooding results in \_\_\_\_\_

Options :

- 1. ✘ high tray efficiency
- 2. ✔ low tray efficiency
- 3. ✘ high gas velocity
- 4. ✘ good contact between the fluids

Question Number : 175 Question Id : 5105295587 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Milk is dried usually in a \_\_\_\_\_

Options :

- 1. ✘ freeze dryer
- 2. ✔ spray dryer
- 3. ✘ tray dryer
- 4. ✘ rotary dryer

Question Number : 176 Question Id : 5105295588 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Out of the following gas liquid contacting devices, for a given set of operating conditions, gas pressure drop is least in \_\_\_\_\_

Options :

- 1. ✔ wetted wall tower
- 2. ✘ bubble cap tower



3. ✘ perforated tray tower
4. ✘ packed tower

Question Number : 177 Question Id : 5105295589 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The relation  $Sc = Pr = 1$  is valid when the mechanism of \_\_\_\_\_

Options :

1. ✔ heat and mass transfer is same
2. ✘ heat and momentum transfer is same
3. ✘ mass and momentum transfer is same
4. ✘ heat, momentum and mass transfer is same

Question Number : 178 Question Id : 5105295590 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Schmidt number is \_\_\_\_\_

Options :

1. ✘ thermal diffusivity/mass diffusivity
2. ✘ thermal diffusivity/momentum diffusivity
3. ✔ momentum diffusivity/mass diffusivity
4. ✘ mass diffusivity/thermal diffusivity

Question Number : 179 Question Id : 5105295591 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following relates the absorption and evolution of heat at the junctions of thermocouple to the current flow in the circuit?

Options :

1. ✘ Seebeck effect
2. ✔ Peltier effect

- 3. ✘ Joule heating effect
- 4. ✘ Thomson effect

Question Number : 180 Question Id : 5105295592 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Stroboscope is used for the measurement of \_\_\_\_\_

Options :

- 1. ✔ rpm of a flywheel
- 2. ✘ frequency of light
- 3. ✘ freezing point depression
- 4. ✘ liquid level

Question Number : 181 Question Id : 5105295593 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following controllers has maximum offset?

Options :

- 1. ✔ P controller
- 2. ✘ P-I controller
- 3. ✘ P-D controller
- 4. ✘ P-I-D controller

Question Number : 182 Question Id : 5105295594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Measurement of pressure in ammonia reactor is done by \_\_\_\_\_

Options :

- 1. ✔ Bourdon gauge
- 2. ✘ U-tube manometer
- 3. ✘ inclined tube manometer



## 4. ✘ Pirani gauge

Question Number : 183 Question Id : 5105295595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Offset \_\_\_\_\_.

Options :

1. ✘ varies with time
2. ✘ varies exponentially with time
3. ✔ does not vary with time
4. ✘ varies as square of time

Question Number : 184 Question Id : 5105295596 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Frequency response of a second order system will be sinusoidal when \_\_\_\_\_

Options :

1. ✘ it is underdamped
2. ✘ it is overdamped
3. ✘ it is critically damped
4. ✔ damping coefficient is zero

Question Number : 185 Question Id : 5105295597 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

In the transfer function for a second order system, if the damping coefficient is equal to one, then the roots of the characteristic equation will be \_\_\_\_\_

Options :

1. ✘ both complex
2. ✘ one real and one complex
3. ✘ both real and unequal

4. ✓ both real and equal

Question Number : 186 Question Id : 5105295598 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

When a mercury thermometer is kept in a bath, if the bath temperature varies sinusoidally as 30 radians/minute and the pertinent transfer function is given by

$$G(s) = \frac{1}{0.2s + 1}$$

then the amplitude ratio is \_\_\_\_\_

Options :

1. ✗  $1/73$
2. ✗  $1/37$
3. ✗  $\frac{1}{\sqrt{73}}$
4. ✓  $\frac{1}{\sqrt{37}}$

Question Number : 187 Question Id : 5105295599 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Solutions having same osmotic pressure are called \_\_\_\_\_

Options :

1. ✓ isotonic solutions
2. ✗ dilute solutions
3. ✗ saturated solutions
4. ✗ ideal solutions

Question Number : 188 Question Id : 5105295600 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The term biological oxygen demand (BOD) is used with reference to \_\_\_\_\_

Options :



1. ✘ potable water
2. ✘ cooling water
3. ✘ distilled water
4. ✔ industrial effluents

Question Number : 189 Question Id : 5105295601 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following is the most poisonous gas?

Options :

1. ✘ coke oven gas
2. ✘ producer gas
3. ✘ blast furnace gas
4. ✔ LD converter gas

Question Number : 190 Question Id : 5105295602 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Widely used method for boiler feed water is \_\_\_\_\_

Options :

1. ✘ cold lime process
2. ✘ coagulation
3. ✔ hot lime soda process
4. ✘ sequestration

Question Number : 191 Question Id : 5105295603 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Zeolite used in water softening process is regenerated by washing with \_\_\_\_\_

Options :

1. ✔ brine
2. ✘ chloramines

3. ✘ sodium bisulphite
4. ✘ liquid chlorines

Question Number : 192 Question Id : 5105295604 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Temporary hardness of water can be removed by \_\_\_\_\_

Options :

1. ✘ addition of a coagulant
2. ✔ boiling
3. ✘ filtration
4. ✘ addition of lime

Question Number : 193 Question Id : 5105295605 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

The biochemical treatment applied to sewage effluent is a process of \_\_\_\_\_

Options :

1. ✘ dehydration
2. ✘ reduction
3. ✔ oxidation
4. ✘ polymerisation

Question Number : 194 Question Id : 5105295606 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

$\alpha$ -rays are \_\_\_\_\_

Options :

1. ✘ negatively charged
2. ✔ positively charged
3. ✘ neutral
4. ✘ same as X-rays



Question Number : 195 Question Id : 5105295607 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

An atom bomb works on the principle of \_\_\_\_\_

Options :

1. ✓ nuclear fission
2. ✗ nuclear fusion
3. ✗ combination of nuclear fusion and nuclear fission
4. ✗ ionization

Question Number : 196 Question Id : 5105295608 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Energy required to compress hot gas compared to cold gas will be \_\_\_\_\_.

Options :

1. ✓ more
2. ✗ less
3. ✗ dependent on nature of gas
4. ✗ same

Question Number : 197 Question Id : 5105295609 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Coke oven gas burns with yellowish flame because of the presence of \_\_\_\_\_

Options :

1. ✗  $\text{CO}_2$
2. ✓  $\text{CH}_4$
3. ✗  $\text{H}_2$
4. ✗  $\text{NH}_3$

Question Number : 198 Question Id : 5105295610 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Spalling of refractory means its \_\_\_\_\_

Options :

1. ✘ softening
2. ✔ fracture due to un even expansion at high temperatures
3. ✘ resistance to compressive loads
4. ✘ resistance to chemical action of gases

Question Number : 199 Question Id : 5105295611 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Which of the following accounts for maximum energy loss?

Options :

1. ✔ flue gases
2. ✘ ash content in the fuel
3. ✘ incomplete combustion
4. ✘ unburnt carbon in flue gases

Question Number : 200 Question Id : 5105295612 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Gross calorific value will be equal to net calorific value for \_\_\_\_\_

Options :

1. ✘  $H_2$
2. ✘  $CH_4$
3. ✔  $CO$
4. ✘  $C_2H_6$