

Question Paper Preview

Question Paper Name:	Chemical Engineering 11th May 2019 Shift1
Subject Name:	Chemical Engineering
Duration:	180
Total Marks:	200
Display Marks:	No
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

	Mathematics
Number of Questions:	50
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 1 Question Id : 8946583409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Let $M = (a_{ij})$ be a 10×10 matrix such that $a_{ij} = \begin{cases} 1, & \text{if } i+j=11 \\ 0, & \text{otherwise} \end{cases}$. Then, the determinant of M is _____.

Options :

1. 0
2. 1
3. -1
4. 11

Question Number : 2 Question Id : 8946583410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Let A and B be two square matrices of order n . If $AB = A$, $BA = B$ then $A^2 + B^2 = \underline{\hspace{2cm}}$.

Options :

1. AB
2. $A - B$
3. 0
4. $A + B$

Question Number : 3 Question Id : 8946583411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Consider the system of linear equations $x + y + z = 3, x - y - z = 4, x - 5y + \alpha z = 6$. Then, the value of α for which this system has an infinite number of solutions is _____.

Options :

1. -5
2. 5
3. 3
4. 1

Question Number : 4 Question Id : 8946583412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $A(\alpha, \beta) = \begin{pmatrix} \cos \alpha & \sin \alpha & 0 \\ -\sin \alpha & \cos \alpha & 0 \\ 0 & 0 & e^\beta \end{pmatrix}$, then the inverse of the matrix $A(\alpha, \beta)$ is _____.

Options :

1. $A(\alpha, \beta)$
2. $A(\alpha, -\beta)$

3. $A(-\alpha, -\beta)$

4. $A(-\alpha, \beta)$

Question Number : 5 Question Id : 8946583413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The rational fraction $\frac{x^2 + 1}{(x^2 + 4)(x - 2)}$ is equal to _____

Options :

1. $\frac{3x + 6}{8(x^2 + 4)} + \frac{5}{4(x - 2)}$

2. $\frac{3x + 6}{4(x^2 + 4)} + \frac{5}{8(x - 2)}$

3. $\frac{3x + 6}{8(x^2 + 4)} + \frac{5}{8(x - 2)}$

4. $\frac{3x + 6}{(x^2 + 4)} + \frac{5}{(x - 2)}$

Question Number : 6 Question Id : 8946583414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\log_2 3 = a, \log_3 5 = b, \log_7 2 = c$, then $\log_{140} 63 =$ _____.

Options :

1. $\frac{1 - 2ac}{2c + abc + 1}$

2. $\frac{1 - 2ac}{2c - abc - 1}$

$$3. \frac{1+2ac}{2c-abc-1}$$

$$4. \frac{1+2ac}{2c+abc+1}$$

Question Number : 7 Question Id : 8946583415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

$$\cos \frac{2\pi}{7} + \cos \frac{4\pi}{7} + \cos \frac{6\pi}{7} = \text{_____}.$$

Options :

$$1. 1$$

$$2. \frac{1}{2}$$

$$3. \frac{-1}{2}$$

$$4. 0$$

Question Number : 8 Question Id : 8946583416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If the angles A, B and C of a triangle are in an arithmetic progression and if a, b and c denote the lengths of the sides opposite to A, B and C respectively, then the value of the

expression $\frac{a}{c} \sin 2C + \frac{c}{a} \sin 2A$ is ___.

Options :

$$1. \sqrt{3}$$

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

3. 1

4. $\frac{1}{2}$

Question Number : 9 Question Id : 8946583417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\sin x + \sin y = \frac{1}{4}$ and $\cos x + \cos y = \frac{1}{3}$, then $\cot(x + y) = \underline{\hspace{2cm}}$.

Options :

1. $\frac{7}{24}$

2. $\frac{24}{7}$

3. $\frac{3}{4}$

4. 1

Question Number : 10 Question Id : 8946583418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\sin(x^\circ + 28^\circ) = \cos(3x^\circ - 78^\circ)$ and $0^\circ < x^\circ < 90^\circ$, then, which of the following is the
value of x° ?

Options :

1. 50°

2. 30°

3. 16°

4. 8°

Question Number : 11 Question Id : 8946583419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $x = \tan\left(\operatorname{Cosec}^{-1}\frac{65}{63}\right)$ and $y = \sec^2\left(\operatorname{Cot}^{-1}\frac{1}{2}\right) + \operatorname{cosec}^2\left(\operatorname{Tan}^{-1}\frac{1}{3}\right)$, then $(x, y) =$ _____.

Options :

1. $\left(\frac{63}{16}, 15\right)$

2. $\left(\frac{16}{63}, 15\right)$

3. $\left(\frac{63}{16}, 5\right)$

4. $\left(\frac{16}{63}, 5\right)$

Question Number : 12 Question Id : 8946583420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The equation $\operatorname{Tan}^{-1}\left(\frac{x+1}{x-1}\right) + \operatorname{Tan}^{-1}\left(\frac{x-1}{x}\right) = \operatorname{Tan}^{-1}(-7)$ has _____.

Options :

1. unique solution $x = 2$

2. two solutions $x = 1, 2$

3. no solution

4. infinite number of solutions

Question Number : 13 Question Id : 8946583421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a triangle ABC , let a, b and c denote the lengths of the sides opposite to

A, B and C respectively. If $\frac{1}{a+c} + \frac{1}{b+c} = \frac{3}{a+b+c}$, then the angle C is _____.

Options :

1. 30°
2. 90°
3. 60°
4. 45°

Question Number : 14 Question Id : 8946583422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\sin hx = 3$ then $x =$ _____.

Options :

1. $\log(3 + \sqrt{10})$
2. $\log(3 - \sqrt{10})$
3. $\log(6 + \sqrt{10})$
4. 1

Question Number : 15 Question Id : 8946583423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is NOT true for the complex numbers z_1 and z_2 ?

Options :

1. $\frac{z_1}{z_2} = \frac{z_1 \bar{z}_2}{|z_2|^2}$

2. $|z_1 + z_2| \leq |z_1| + |z_2|$

3. $|z_1 + z_2| \leq ||z_1| - |z_2||$

4. $|z_1 + z_2|^2 + |z_1 - z_2|^2 = 2|z_1|^2 + 2|z_2|^2$

Question Number : 16 Question Id : 8946583424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a complex number $z = \frac{\sqrt{3}}{2} + i\frac{1}{2}$, then z^4 is _____.

Options :

1. $2\sqrt{2} + 2i$

2. $\frac{-1}{2} + i\frac{\sqrt{3}}{2}$

3. $\frac{\sqrt{3}}{2} - i\frac{1}{2}$

4. $\frac{\sqrt{3}}{8} - i\frac{1}{8}$

Question Number : 17 Question Id : 8946583425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The equation of the straight line which makes intercepts r and s on the coordinate axes

such that $r + s = 5$ and $rs = 6$ is $ax + by + c = 0$, then $a + b + c = \text{---}$.

Options :

1. 11

2. 5

3. -7

4. -1

Question Number : 18 Question Id : 8946583426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a straight line $ax + by + \sqrt{5} = 0$ touches the circle $x^2 + y^2 = 5$, then which of the following is TRUE?

Options :

1. $5(a^2 + b^2) = 1$

2. $a^2 + b^2 = \sqrt{5}$

3. $a^2 + b^2 = 1$

4. $\sqrt{a^2 + b^2} = 5$

Question Number : 19 Question Id : 8946583427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a chord of length 12 cm is at a distance of $4\sqrt{10}$ cm from the centre of the circle, then the radius of the circle is _____.

Options :

1. 14 cm

2. $\sqrt{304}$ cm

3. 4 cm

4. $\sqrt{124}$ cm

Question Number : 20 Question Id : 8946583428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The 2019th derivative of the function $(x-1)e^{-x}$ is _____

Options :

1. $\frac{x-2019}{e^x}$

2. $\frac{2019-x}{e^x}$

3. $\frac{x-2020}{e^x}$

4. $\frac{2020-x}{e^x}$

Question Number : 21 Question Id : 8946583429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $z = f(x+ct) + \varphi(x-ct)$, then $\frac{\partial^2 z}{\partial t^2} =$ _____.

Options :

1. $c^2 \frac{\partial^2 z}{\partial x^2}$

2. $-c^2 \frac{\partial^2 z}{\partial x^2}$

3. $\frac{1}{c^2} \frac{\partial^2 z}{\partial x^2}$

4. $-\frac{1}{c^2} \frac{\partial^2 z}{\partial x^2}$

Question Number : 22 Question Id : 8946583430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $x = r \cos \theta$, $y = r \sin \theta$ and $U = \frac{f(\theta)}{r}$ then $x \frac{\partial U}{\partial x} + y \frac{\partial U}{\partial y} = \underline{\hspace{2cm}}$.

Options :

1. 0
2. U
3. $-U$
4. $2U$

Question Number : 23 Question Id : 8946583431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Let $f(x+y) = f(x)f(y)$, $\forall x, y$ and $f'(0) = 5$, $f(2019) = 15$. Then the value of $f'(2019)$ is _____.

Options :

1. 3
2. 75
3. $\frac{1}{3}$
4. $\frac{1}{75}$

Question Number : 24 Question Id : 8946583432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The set of values of x for which the function $f(x) = 2x^3 - 9x^2 + 12x + 4$ is increasing is _____.

Options :

1. $1 < x < 2$

2. all $x \in \mathbb{R}$

3. $\mathbb{R} - [1, 2]$

4. $x \geq 2$

Question Number : 25 Question Id : 8946583433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

$$\lim_{x \rightarrow \infty} x \left(\log \left(1 + \frac{x}{2} \right) - \log \left(\frac{x}{2} \right) \right) = \text{_____}.$$

Options :

1. e^2

2. ∞

3. 1

4. 2

Question Number : 26 Question Id : 8946583434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $f(x, y, z) = x^3 + xz^2 + y^3 + xyz$, $x = e^t$, $y = \cos t$, $z = t^3$ then $\frac{df}{dt}$ at $t = 0$ is _____.

Options :

1. 2

2. 4

3. e

4. 3

Question Number : 27 Question Id : 8946583435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is the value of $5050 \times \frac{\int_0^1 (1 - (1-x)^{50})^{100} x^{49} dx}{\int_0^1 (1-x^{50})^{101} x^{49} dx}$?

Options :

1. 5100

2. 1

3. 5050

4. $\frac{1}{2}$

Question Number : 28 Question Id : 8946583436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

$$\int_0^1 \max \left\{ x, \frac{1}{2} - x \right\} dx = \underline{\hspace{2cm}}.$$

Options :

1. 0

2. $\frac{1}{2}$

3. $\frac{9}{16}$

4. $\frac{9}{8}$

Question Number : 29 Question Id : 8946583437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

$$\lim_{n \rightarrow \infty} \frac{1}{n^6} \sum_{k=1}^n k^5 = \underline{\hspace{2cm}}.$$

Options :

1. $\frac{1}{6}$

2. $\frac{1}{5}$

3. 1

4. 6

Question Number : 30 Question Id : 8946583438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

$$\int_{-1}^1 \frac{x^{15}(1-x^2)^{12}}{(1+x^2)^8} dx = \underline{\hspace{2cm}}.$$

Options :

1. 0

2. $\frac{22}{7} - \pi$

3. $\frac{2}{105}$

4. $\frac{71}{15} - \frac{3\pi}{4}$

Question Number : 31 Question Id : 8946583439 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 curves $y = 2 - x^2$ and $y = -x$ is _____.

Options :

1. 1

2. $\frac{8}{19}$

3. $\frac{35}{4}$

4. $\frac{27}{6}$

Question Number : 32 Question Id : 8946583440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The volume of the solid obtained by revolving the region bounded by the curves

$y = x^3$, $y = 8$ and $x = 0$ about the y -axis is _____

Options :

1. $\frac{96}{5}$

2. $\frac{96\pi}{5}$

3. $\frac{32\pi}{5}$

4. $\frac{32}{5}$

Question Number : 33 Question Id : 8946583441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The value of $\int_0^{\pi} \theta \sin^2 \theta \cos^4 \theta d\theta$ is _____.

Options :

1. $\frac{\pi^2}{32}$

2. $\frac{\pi}{32}$

3. $\frac{\pi^2}{16}$

4. $\frac{\pi}{16}$

Question Number : 34 Question Id : 8946583442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The average value of the function $f(x) = 4 - x^2$ over the interval $[-1, 3]$ is _____.

Options :

1. 5

2. $\frac{20}{3}$

3. $\frac{5}{3}$

4. 1

Question Number : 35 Question Id : 8946583443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The differential equation $x \frac{dy}{dx} = y + x^2$, $x > 0$ satisfying $y(0) = 0$ has _____.

Options :

1. infinitely many solutions

2. no solution

3. a unique solution

4. exactly two solutions

Question Number : 36 Question Id : 8946583444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The differential equation $(axy^3 + y \cos x)dx + (x^2y^2 + b \sin x)dy = 0$ is an exact differential equation for _____.

Options :

1. $a = 1, b = \frac{3}{2}$

2. $a = \frac{3}{2}, b = 1$

3. $a = \frac{2}{3}, b = 1$

4. $a = 1, b = \frac{2}{3}$

Question Number : 37 Question Id : 8946583445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $\sin x$ is a solution of the differential equation $\frac{d^4 y}{dx^4} + 2\frac{d^3 y}{dx^3} + 6\frac{d^2 y}{dx^2} + 2\frac{dy}{dx} + 5y = 0$,

then the general solution is _____.

Options :

1. $y = c_1 \sin x + c_2 \cos x + e^{-x}(c_3 \sin 2x + c_4 \cos 2x)$

2. $y = c_1 \sin x + c_2 \cos x + c_3 \sin 2x + c_4 \cos 2x$

3. $y = c_1 \sin x + c_2 \cos x + c_3 e^{-3x} + c_4 e^{-2x}$

4. $y = c_1 \sin x + c_2 \cos x + c_3 e^{3x} + c_4 e^{2x}$

Question Number : 38 Question Id : 8946583446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $D \equiv \frac{d}{dx}$, then $\frac{1}{D^2 - 4D + 13}(6e^{2x} \sin 3x)$ is _____.

Options :

1. $-xe^{2x} \cos 3x$

2. $xe^{2x} \cos 3x$

3. $-xe^{2x} \sin 3x$

4. $xe^{2x} \sin 3x$

Question Number : 39 Question Id : 8946583447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The general solution of $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right) \frac{dx}{dy} = 1$ is _____.

Options :

1. $y = e^{2\sqrt{x}} (2\sqrt{x} + c)$

2. $y = 2\sqrt{x} e^{2\sqrt{x}} + c$

3. $y = 2\sqrt{x} e^{-2\sqrt{x}} + c$

4. $y = e^{-2\sqrt{x}} (2\sqrt{x} + c)$

Question Number : 40 Question Id : 8946583448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Let y be the solution of the differential equation $\frac{dy}{dx} + y = x$, $x \in \mathbb{R}$ and $y(-1) = 0$.

Then, $y(1)$ is equal to _____.

Options :

1. $\frac{2}{e} - \frac{2}{e^2}$

2. $2e^{-2}$

3. $2 - \frac{2}{e}$

4. $2 - 2e$

Question Number : 41 Question Id : 8946583449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If the substitution $x = X + h$, $y = Y + k$ transforms the differential equation $(y - x + 1)dy - (y + x + 2)dx = 0$ into a homogeneous equation, then the value of (h, k) is _____.

Options :

1. $\left(\frac{1}{2}, \frac{3}{2}\right)$

2. $\left(\frac{-1}{2}, \frac{-3}{2}\right)$

3. $\left(\frac{3}{2}, \frac{1}{2}\right)$

4. $\left(\frac{-3}{2}, \frac{-1}{2}\right)$

Question Number : 42 Question Id : 8946583450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The general solution of $\frac{dy}{dx} - y = y^2(\sin x + \cos x)$ is _____.

Options :

1. $y = \frac{1}{ce^x - \sin x}$

2. $y = ce^{-x} - e^x \sin x$

3. $y = ce^{-x} - \sin x$

4. $y = \frac{1}{ce^{-x} - \sin x}$

Question Number : 43 Question Id : 8946583451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of the function $f(t) = \begin{cases} \sin t, & \text{for } 0 \leq t \leq \pi \\ 0, & \text{for } t > \pi \end{cases}$

is _____.

Options :

1. $\frac{1}{(1+s^2)}$ for all $s > 0$

2. $\frac{1}{(1+s^2)}$ for all $s < \pi$

3. $\frac{(1+e^{-\pi s})}{(1+s^2)}$ for all $s > 0$

4. $\frac{e^{-\pi s}}{(1+s^2)}$ for all $s > 0$

Question Number : 44 Question Id : 8946583452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The inverse Laplace transform of $\frac{5}{s} - \frac{3e^{-3s}}{s} - \frac{2e^{-7s}}{s}$ is _____.

Options :

1. $f(x) = \begin{cases} 5, & 0 < x < 3 \\ 0, & 3 < x < 7 \\ 2, & x > 7 \end{cases}$

2.
$$f(x) = \begin{cases} 5, & 0 < x < 7 \\ 2, & x > 7 \end{cases}$$

3.
$$f(x) = \begin{cases} 5, & 0 < x < 3 \\ 2, & 3 < x < 7 \\ 0, & x > 7 \end{cases}$$

4.
$$f(x) = \begin{cases} 5, & 0 < x < 7 \\ 0, & x > 7 \end{cases}$$

Question Number : 45 Question Id : 8946583453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of a function $f(x)$ is $F(s) = \frac{1}{s^3 + 2s^2 + 2s}$ Then, $\lim_{x \rightarrow 0} f(x) =$

_____.

Options :

1. 0

2. 3

3. ∞

4. $\frac{1}{2}$

Question Number : 46 Question Id : 8946583454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The Laplace transform of the solution of the differential equation $\frac{dy}{dx} - 2y = e^{5x}$ with the

initial condition $y(0) = 3$ is _____.

Options :

1. $\frac{1}{3(s-2)} + \frac{1}{3(s-5)}$

2. $\frac{8}{3(s-2)} + \frac{1}{s-5}$

3. $\frac{8}{3(s-2)} + \frac{1}{3(s-5)}$

4. $\frac{8}{s-2} + \frac{1}{3(s-5)}$

Question Number : 47 Question Id : 8946583455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $L(y(x)) = Y(s)$ and $y(x) = x^3 + \int_0^x \sin(x-t)y(t)dt$ then $\frac{1}{6}Y(s) = \underline{\hspace{2cm}}$.

Options :

1. $\left(\frac{1}{s^4} + \frac{1}{s^6}\right)$

2. $\left(\frac{1}{s^3} + \frac{1}{s^5}\right)$

3. $\left(\frac{1}{s^3} + \frac{1}{s^7}\right)$

4. $\left(\frac{1}{s} + \frac{1}{s^3}\right)$

Question Number : 48 Question Id : 8946583456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For $x > 0$, $\int_0^\infty \frac{\sin xt}{t} dt$ is $\underline{\hspace{2cm}}$.

Options :

1. 0
2. $\frac{\pi}{2x}$
3. $\frac{1}{x}$
4. $\frac{\pi}{2}$

Question Number : 49 Question Id : 8946583457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $f(x) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx)$ is the Fourier series of the function

$$f(x) = \begin{cases} 0, & -\pi \leq x < 0 \\ \pi, & 0 \leq x \leq \pi \end{cases} \text{ then, which of the following is TRUE?}$$

Options :

1. $a_n = 0$, for all $n \geq 0$
2. $a_0 = \frac{\pi}{2}$ and $a_n = 0$, for all $n \geq 1$
3. $b_n \neq 0$, for all $n \geq 1$
4. $a_0 = \pi$ and $a_n = 0$, for all $n \geq 1$

Question Number : 50 Question Id : 8946583458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A function $f(x)$ is such that $f(x + 2\pi) = f(x)$ and $f(x) = x$, $-\pi \leq x \leq \pi$. The Fourier series of $f(x)$ is _____.

Options :

1. $2(\sin x - \frac{1}{2} \sin 2x + \frac{1}{3} \sin 3x - \dots)$

2. $2(\sin x + \frac{1}{2} \sin 2x + \frac{1}{3} \sin 3x + \dots)$

3. $2(\cos x - \frac{1}{2} \cos 2x + \frac{1}{3} \cos 3x - \dots)$

4. $2(\cos x + \frac{1}{2} \cos 2x + \frac{1}{3} \cos 3x + \dots)$

Physics

Number of Questions:

25

Display Number Panel:

Yes

Group All Questions:

No

Question Number : 51 Question Id : 8946583459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The dimensional formula for gravitational constant is _____.

Options :

1. $L^3T^{-2}M^{-1}$

2. $L^3T^2M^{-1}$

3. $L^2T^3M^{-2}$

4. $L^3T^1M^{-3}$

Question Number : 52 Question Id : 8946583460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The dimensions of the quantities in one of the following pairs are same. Identify the pairs.

Options :

1. torque and work
2. angular momentum and work
3. energy and Young's modules
4. light year and wavelength

Question Number : 53 Question Id : 8946583461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is not correct?

Options :

1. $\mathbf{j} \times \mathbf{i} = -\mathbf{k}$
2. $\mathbf{k} \times \mathbf{j} = -\mathbf{i}$
3. $\mathbf{i} \times \mathbf{k} = -\mathbf{j}$
4. $\mathbf{k} \times \mathbf{i} = -\mathbf{j}$

Question Number : 54 Question Id : 8946583462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If $0.5\mathbf{i} + 0.8\mathbf{j} + c\mathbf{k}$ is a unit vector then c is _____.

Options :

1. $\sqrt{0.89}$
2. 0.2
3. 0.3
4. $\sqrt{0.11}$

Question Number : 55 Question Id : 8946583463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is correct?

Options :

1. $A.B \neq B.A$
2. $A.(B+C) = A.B + C.A$
3. $A.B = A.B - A.C$
4. $A.B = -B.A$

Question Number : 56 Question Id : 8946583464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The acceleration due to gravity on the surface of the earth is given by _____

Options :

1. G
2. GM/R^2
3. GM/R
4. GM

Question Number : 57 Question Id : 8946583465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The value of g is maximum at _____.

Options :

1. equator
2. Pole
3. higher altitudes

4. at the centre of the earth

Question Number : 58 Question Id : 8946583466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

When the speed of rotation of earth increases your weight _____

Options :

1. increases
2. decreases
3. remains constant
4. becomes zero

Question Number : 59 Question Id : 8946583467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The value of G is zero at _____

Options :

1. nowhere
2. the centre of the earth
3. surface of the earth
4. pole

Question Number : 60 Question Id : 8946583468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If the linear momentum is increased by 50%, the kinetic energy will be increased
by _____

Options :

1. 50%

2. 100%
3. 125%
4. 25%

Question Number : 61 Question Id : 8946583469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A metallic block slides down a smooth inclined plane when released from the top, while the other falls freely from the same point, then _____

Options :

1. both will reach the ground with the same velocity
2. both will reach the ground together
3. both will reach the ground travelling with same acceleration
4. the block sliding down the plane will strike earlier

Question Number : 62 Question Id : 8946583470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A long spring is stretched by 2 cm and its potential energy is u . If the spring is stretched by 10 cm, then the potential energy stored in it will be _____.

Options :

1. $u/24$
2. $u/5$
3. $5u$
4. $25u$

Question Number : 63 Question Id : 8946583471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Two masses of 1 gm and 4 gm are moving with equal kinetic energies. The ratio of the magnitudes of their linear momentum is _____

Options :

1. 4:1
2. $\sqrt{2}:1$
3. 1:2
4. 1:16

Question Number : 64 Question Id : 8946583472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A body is dropped from rest at height 0.5 m. What will be its velocity when it just strikes the ground?

Options :

1. 7 m/s
2. 9.8 m/s
3. 4.9 m/s
4. $\sqrt{9.8}$ m/s

Question Number : 65 Question Id : 8946583473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A particle moves such that its acceleration a is given by $a = -bx$ where x is the displacement from equilibrium and b is a constant. The period of Oscillation is _____ .

Options :

1. $2\pi b$

2. $2\pi\sqrt{b}$

3. $2\pi/b$

4. $2\sqrt{\pi}/b$

Question Number : 66 Question Id : 8946583474 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 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 : 67 Question Id : 8946583475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

When a star approaches the earth, the waves are shifted towards _____

Options :

1. green colour

2. yellow colour

3. blue end

4. red end

Question Number : 68 Question Id : 8946583476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

If a tuning fork of frequency 90 is sounded and moved towards an observer with a velocity equal to one tenth the velocity of sound, then the note heard by the observer will have frequency_____.

Options :

1. 100
2. 90
3. 80
4. 900

Question Number : 69 Question Id : 8946583477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What is the most important factor which helps to recognise a person by his/her voice alone_____

Options :

1. quality
2. pitch
3. intensity
4. quality, pitch and intensity

Question Number : 70 Question Id : 8946583478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The quality of tone_____

Options :

1. decreases with loudness
2. varies inversely as amplitude

3. varies directly as pitch
4. depends on the overtones present

Question Number : 71 Question Id : 8946583479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The conduction of heat from hot body to cold body is an example of _____.

Options :

1. reversible process
2. irreversible process
3. isothermal process
4. isobaric process

Question Number : 72 Question Id : 8946583480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

From the isothermal drawn from Andrews experiment, it can be inferred that _____

Options :

1. CO₂ is a perfect gas
2. there is continuity of state
3. there is discontinuity of state
4. gases like CO₂ and H₂ cannot be liquefied

Question Number : 73 Question Id : 8946583481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A diesel cycle works at _____

Options :

1. constant volume
2. constant pressure
3. constant temperature
4. both constant volume and constant temperature

Question Number : 74 Question Id : 8946583482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The transition temperature of most low temperature superconducting elements is in the
range of _____

Options :

1. zero to 10 k
2. 10 k to 20 k
3. 20 k to 50 k
4. 50 k alone

Question Number : 75 Question Id : 8946583483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Propagation of light through fiber core is due to _____

Options :

1. diffraction
2. interference
3. total internal reflection
4. reflection

Number of Questions:	25
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 76 Question Id : 8946583484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following energy orders is correct?

Options :

1. $6s < 4f < 5d < 6p$
2. $4f < 5d < 6s < 6p$
3. $4f < 6s < 6p < 5d$
4. $6s < 6p < 5d < 4f$

Question Number : 77 Question Id : 8946583485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An element A of atomic number 11 combines with an element B of atomic number 17. The compound formed is _____.

Options :

1. Covalent AB
2. Ionic AB
3. Covalent AB₂
4. Ionic AB₂

Question Number : 78 Question Id : 8946583486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The oxidation number of 'S' in S₈, S₂F₂, H₂S respectively are _____.

Options :

1. 0, +1 and -2

2. +2, +1 and -2
3. 0, +1 and +2
4. -2, +1 and -2

Question Number : 79 Question Id : 8946583487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The elements A, B, C and D have the following electronic configurations:

A: $1S^2, 2S^2, 2P^1$

B: $1S^2, 2S^2, 2P^6, 3S^2, 3P^1$

C: $1S^2, 2S^2, 2P^6, 3S^2, 3P^3$

D: $1S^2, 2S^2, 2P^6, 3S^2, 3P^5$

The elements that belong to same group are _____.

Options :

1. A and C
2. C and D
3. A and D
4. A and B

Question Number : 80 Question Id : 8946583488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

4.9 gm of H_2SO_4 is present in 2 lit of its solution. The molarity of the solution is

_____.

Options :

1. 0.1 M

2. 0.025 M
3. 0.25 M
4. 0.01 M

Question Number : 81 Question Id : 8946583489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The molecular weight of H_3PO_4 is 98. The equivalent weight is _____ gram / equivalents.

Options :

1. 98
2. 49
3. 32.66
4. 24.5

Question Number : 82 Question Id : 8946583490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is the Bronsted acid?

Options :

1. Cl^-
2. NH_2^-
3. CH_3COO^-
4. NH_4^+

Question Number : 83 Question Id : 8946583491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The pH of 1 M KOH is _____.

Options :

1. 12
2. 11
3. 14
4. 13

Question Number : 84 Question Id : 8946583492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Froth floatation process is used for the _____.

Options :

1. Oxide ores
2. Sulphide ores
3. Chloride ores
4. Oxide ores and Chloride ores

Question Number : 85 Question Id : 8946583493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The composition of brass is _____.

Options :

1. Cu and Zn
2. Cu and Ni
3. Cu and Mn

4. Cu and Fe

Question Number : 86 Question Id : 8946583494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following statements is correct?

Options :

1. Cathode is positive terminal in an electrolytic cell
2. Cathode is negative terminal in a galvanic cell
3. Reduction occurs at cathode in either of cells
4. Oxidation occurs at cathode in either of cells

Question Number : 87 Question Id : 8946583495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In the electrolysis of CuCl_2 solution using copper electrode, if 2.5 gm of Cu is deposited at cathode, then at anode _____.

Options :

1. 890 mL of Cl_2 at STP is liberated
2. 445 mL of O_2 at STP is liberated
3. 2.5 gm of copper is deposited
4. a decrease of 2.5 gm of mass takes place

Question Number : 88 Question Id : 8946583496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The unit of resistivity is _____.

Options :

1. Ω

2. $\Omega \text{ m}$

3. Ω / m

4. $\Omega \text{ m}^2$

Question Number : 89 Question Id : 8946583497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following metals provide cathodic protection to iron?

Options :

1. Cu and Ni

2. Al and Zn

3. Al and Cu

4. Co and Ni

Question Number : 90 Question Id : 8946583498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The chemical composition of rust is _____.

Options :

1. Fe_3O_4

2. Fe_3O_3

3. $\text{Fe}_2\text{O}_3 \cdot n\text{H}_2\text{O}$

4. $\text{Fe}_3\text{O}_3 \cdot x\text{H}_2\text{O}$

Question Number : 91 Question Id : 8946583499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

1 ppm of hardness of water is equal to _____.

Options :

1. 1 part of CaCO_3 hardness in 10^6 parts of water
2. 1 part of CaCO_3 hardness in 10^8 parts of water
3. 1 part of CaCO_3 hardness in 10^7 parts of water
4. 1 part of CaCO_3 hardness in 10^5 parts of water

Question Number : 92 Question Id : 8946583500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The temporary hardness of water is due to the presence of _____.

Options :

1. MgCl_2 and CaCl_2
2. $\text{Ca}(\text{NO}_3)_2$ and $\text{Mg}(\text{NO}_3)_2$
3. CaSO_4 and MgSO_4
4. $\text{Ca}(\text{HCO}_3)_2$ and $\text{Mg}(\text{HCO}_3)_2$

Question Number : 93 Question Id : 8946583501 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The basic buffer solution is a mixture of _____.

Options :

1. $\text{NH}_3 + \text{NH}_4\text{Cl}$
2. $\text{HCl} + \text{NH}_4\text{Cl}$
3. $\text{NaCl} + \text{NH}_4\text{Cl}$
4. $\text{KOH} + \text{NH}_4\text{Cl}$

Question Number : 94 Question Id : 8946583502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following polymers has amide linkage?

Options :

1. Terylene
2. Bakelite
3. Nylon
4. PVC

Question Number : 95 Question Id : 8946583503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The monomer of natural rubber is _____.

Options :

1. Butadiene
2. Chloroprene
3. 2-methyl 1,2 butadiene
4. 2-methyl 1,3 butadiene

Question Number : 96 Question Id : 8946583504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is a thermo setting?

Options :

1. Bakelite
2. Polyethylene
3. Nylon-6
4. Natural rubber

Question Number : 97 Question Id : 8946583505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The composition of water gas is _____.

Options :

1. CO and H₂ are combustible gases and CO₂ and N₂ are non-combustible gases
2. CO + CO₂ are combustible gases and H₂O and N₂ non-combustible gases
3. CO + N₂ are combustible gases and H₂O and H₂ are non-combustible gases
4. N₂+H₂ are combustible gases and CO + H₂O are non-combustible gases

Question Number : 98 Question Id : 8946583506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Earth is protected from UV radiation by _____.

Options :

1. Nitrogen layer
2. Ozone layer
3. Carbon dioxide layer
4. Oxygen layer

Question Number : 99 Question Id : 8946583507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of following statements is not correct?

Options :

1. CO is the main air pollutant
2. All pollutants are not wastes
3. Water is polluted by dissolved Oxygen

4. Lichens are pollution indicators

Question Number : 100 Question Id : 8946583508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Minamata disease is caused due to the presence of _____.

Options :

1. Cd
2. Pb
3. As
4. Hg

Chemical Engineering

Number of Questions:	100
Display Number Panel:	Yes
Group All Questions:	No

Question Number : 101 Question Id : 8946583509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

On heating an elastomer under tensile load, it shrinks _____.

Options :

1. to maximise the enthalpy
2. to maximise the entropy
3. to avoid breaking
4. to minimize entropy

Question Number : 102 Question Id : 8946583510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

On heating a rubber under tensile force, it _____.

Options :

1. shrinks
2. expands
3. expands rapidly
4. shows no change

Question Number : 103 Question Id : 8946583511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the metal in Group-I with the appropriate extractive process in Group-II

Group-I	Group-II
P. Fe	i. Metallothermic Reduction
Q. Ni	ii. Carbothermic reduction
R. Al	iii. Matte Smelting
S. Cr	iv. Fused Salt Electrolysis

Options :

1. P-i, Q-ii, R-iv, S-iii
2. P-ii, Q-iv, R-i, S-iii
3. P-ii, Q-iii, R-iv, S-i
4. P-ii, Q-i, R-iv, S-iii

Question Number : 104 Question Id : 8946583512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The passive film in stainless steel forms above the _____.

Options :

1. primary passive potential

2. breakdown potential
3. trans-passive potential
4. pitting potential

Question Number : 105 Question Id : 8946583513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following statements is not correct?

Options :

1. corrosion of zinc increases due to the presence of FeCl_3 in the dilute HCl solution than that in the absence of FeCl_3
2. the failure of silver bridge was caused by growth of a miniature crack in the steel eye-bar over the years due to stress corrosion and corrosion fatigue
3. parts with smoother surface finish undergo lesser corrosion than those with rough surfaces
4. stainless steel does not suffer with pitting corrosion

Question Number : 106 Question Id : 8946583514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following statements cannot be true in the context of crevice corrosion?

Options :

1. oxygen concentration depletes in the crevice
2. acidity increases in the crevice region
3. crevice corrosion is more pronounced on flat and smooth surface
4. crevice corrosion can be avoided to some extent by regular cleaning of dirt, dust, mud, etc., and by better design considerations

Question Number : 107 Question Id : 8946583515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What is the mass of NaCl to be added to one litre water to make its normality as

1 N solution?

Options :

1. 40 grams
2. 58.5 grams
3. 35.5 grams
4. 23 grams

Question Number : 108 Question Id : 8946583516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Wet soil of 100 kg has 60% by weight of water. If 50% of the water is evaporated,

what is the final weight % of water in wet soil?

Options :

1. 10
2. 21.4
3. 42.8
4. 50

Question Number : 109 Question Id : 8946583517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An ideal gas of volume 1 m^3 at 300 K is heated at a constant pressure to 400 K. What is the

final volume in m^3 ?

Options :

1. 0.5
2. 1

3. 0.75

4. 1.33

Question Number : 110 Question Id : 8946583518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Wet sand has 0.5 kg water per kg of dry sand. What is the moisture content in weight % on wet basis?

Options :

1. 33.3

2. 66.6

3. 50

4. 25

Question Number : 111 Question Id : 8946583519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A solution of 0.1 N NaCl has to be prepared from 200 ml of 1 N NaCl by diluting with distilled water. What is the volume of distilled water to be added in ml?

Options :

1. 100

2. 200

3. 1800

4. 800

Question Number : 112 Question Id : 8946583520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

10 litres of cold water at 20 °C is to be mixed with 'x' litres of water at 60 °C to have finally a 40 °C water. What is the value of x?

Options :

1. 5

2. 10
3. 20
4. 30

Question Number : 113 Question Id : 8946583521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The approximate mole percentage of nitrogen in air is _____.

Options :

1. 20
2. 40
3. 60
4. 80

Question Number : 114 Question Id : 8946583522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A reaction is considered exothermic if _____.

Options :

1. heat is produced
2. heat is consumed
3. heat is neither produced nor consumed
4. pressure is increased

Question Number : 115 Question Id : 8946583523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What is the average molecular weight of a gas containing 50% CO₂ and 50% CO by volume?

Options :

1. 72

2. 28
3. 44
4. 36

Question Number : 116 Question Id : 8946583524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A gas containing 10 moles of CO is to be fully burnt by Oxygen using 60% excess Oxygen.

The reaction is $\text{CO} + 0.5 \text{O}_2 \rightarrow \text{CO}_2$. What is the number of moles of oxygen required?

Options :

1. 2
2. 4
3. 8
4. 16

Question Number : 117 Question Id : 8946583525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is undesirable in the catalytic reforming naphtha?

Options :

1. Dehydrogenation of naphthenes
2. Isomerisation of naphthenes
3. Cyclisation of paraffins
4. Hydrocracking of paraffins

Question Number : 118 Question Id : 8946583526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In petroleum refining, the process used for conversion of hydrocarbons to aromatics is

_____.

Options :

1. Catalytic cracking

2. Catalytic reforming
3. Hydrotreating
4. Alkylation

Question Number : 119 Question Id : 8946583527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Ethylene oxide is manufactured by _____.

Options :

1. Catalytic oxidation of ethylene
2. Catalytic oxidation-dehydrogenation of methanol
3. Catalytic dehydrogenation of propylene oxide
4. Catalytic dehydrogenation of formaldehyde

Question Number : 120 Question Id : 8946583528 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the items of Group A with the appropriate item in the Group B

Group A	Group B
(I) Cetane number	(a) High speed diesel oil
(II) Smoke point	(b) Kerosene
	(c) Gasoline
	(d) Aromatics

Options :

1. (I)-(a), (II)-(b)

2. (I)-(c), (II)-(a)
3. (I)-(b), (II)-(a)
4. (I)-(c), (II)-(d)

Question Number : 121 Question Id : 8946583529 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the items of Group A with the appropriate item in the Group B

Group A	Group B
(I) Nylon-66	(a) Elastomer
(II) Dacron	(b) Polyamide
(III) Rayon	(c) Polyester
(IV) Rubber	(d) Cellulose

Options :

1. (I)-(a), (II)-(b), (III)-(c), (IV)-(d)
2. (I)-(b), (II)-(c), (III)-(d), (IV)-(a)
3. (I)-(c), (II)-(b), (III)-(d), (IV)-(a)
4. (I)-(d), (II)-(c), (III)-(b), (IV)-(a)

Question Number : 122 Question Id : 8946583530 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Identify the group in which all the polymers mentioned can be used to make fibers

Options :

1. Butadiene copolymers, polyamides, urea aldehydes

2. Cellulose derivatives, polyisoprene, polyethylene

3. Cellulose derivatives, polyamides, polyurethanes

4. Polypropylenes, polyvinylchloride, silicones

Question Number : 123 Question Id : 8946583531 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is desirable in gasoline but undesirable in kerosene?

Options :

1. Aromatics
2. Mercaptans
3. Naphthenic acid
4. Paraffins

Question Number : 124 Question Id : 8946583532 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the unit processes in Group-I with the industries in Group-II

Group-I	Group-II
(P) Saponification	(i) Petroleum refining
(Q) Calcination	(ii) Synthetic fibers
(R) Alkylation	(iii) Cement
	(iv) Soaps and detergents

Options :

1. P-(i), Q-(3), R-(4)
2. P-(2), Q-(3), R-(4)

3. P-(4), Q-(2), R-(1)

4. P-(4), Q-(3), R-(1)

Question Number : 125 Question Id : 8946583533 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The preferred material of construction of storage tanks for 98% sulphuric acid is _____.

Options :

1. Aluminium

2. Lead

3. Stainless steel 316

4. Mild steel

Question Number : 126 Question Id : 8946583534 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The favourable conditions for the maximum yield of ammonia by Haber process are _____.

Options :

1. high pressure and high temperature

2. high pressure and low temperature

3. low pressure and high temperature

4. low pressure and low temperature

Question Number : 127 Question Id : 8946583535 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Prilling tower is used in the manufacture of _____.

Options :

1. Cement

2. Potassium chloride

3. Urea

4. Triple superphosphate

Question Number : 128 Question Id : 8946583536 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Triple superphosphate is manufactured by reacting _____.

Options :

1. Phosphate rock with phosphoric acid
2. Phosphate rock with sulphuric acid
3. Phosphate rock with nitric acid
4. Ammonium phosphate with phosphoric acid

Question Number : 129 Question Id : 8946583537 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Each item of equipment mentioned in the Group A is identified with the manufacturing process for one of the products mentioned in the Group B. Match the equipment with the corresponding products.

Group A	Group B
(I) Fermenter	(a) Ammonium nitrate
(II) Membrane cell	(b) Ethanol from molasses
(III) Waste heat boiler	(c) Caustic soda
(IV) Rotary kiln	(d) Diammonium phosphate
(V) Prilling tower	(e) Sulphuric acid
	(f) Cement
	(g) Yellow phosphorous
	(h) Sodium metal

Options :

- (I)-(b), (II)-(d), (III)-(f), (IV)-(g), (V)-(a)
- (I)-(b), (II)-(g), (III)-(a), (IV)-(c), (V)-(d)
- (I)-(b), (II)-(h), (III)-(e), (IV)-(a), (V)-(f)
- (I)-(b), (II)-(c), (III)-(e), (IV)-(f), (V)-(a)

Question Number : 130 Question Id : 8946583538 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the most appropriate pairs from the following

P. Carbon disulphide	i. Nylon-6
Q. Caprolactam	ii. Nylon-66
R. Gypsum	iii. Phosphoric acid
	iv. Viscose rayon

Options :

1. P-iv, Q-ii, R-iii
2. P-ii, Q-I, R-iii
3. P-iii, Q-I, R-iv
4. P-iv, Q-I, R-iii

Question Number : 131 Question Id : 8946583539 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following process sequences is used in the sugar industry?

Options :

1. Ca_2HPO_4 /Lime treatment → Crystallization → Crushing
2. Ca_2HPO_4 /Lime treatment → Multiple stage evaporation → Crystallization
3. Crushing → Crystallization → Ca_2HPO_4 /Lime treatment
4. Multiple stage evaporation → Crystallization → Ca_2HPO_4 /Lime treatment

Question Number : 132 Question Id : 8946583540 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Water gas shift reaction in industry is carried out in the presence of _____.

Options :

1. Ni

2. Fe
3. V_2O_5
4. AgO

Question Number : 133 Question Id : 8946583541 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The units of viscosity of a fluid are _____.

Options :

1. $N\ s/m^2$
2. $N^2\ s/m$
3. $N\ s^2/m$
4. $N\ s/m$

Question Number : 134 Question Id : 8946583542 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The nature of velocity profile in a circular pipe under laminar condition is _____.

Options :

1. triangular
2. flat
3. parabolic
4. hyperbolic

Question Number : 135 Question Id : 8946583543 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The inertial term due to flow in Bernoulli equation is _____.

Options :

1. $\rho V/2$

2. $\rho V^2/2$
3. $\rho V^4/2$
4. $\rho^2 V/2$

Question Number : 136 Question Id : 8946583544 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The terminal settling velocity of a particle in a fluid for Reynolds number less than 1 depends on density of fluid (ρ_f) and density of particle (ρ_p) as _____.

Options :

1. ρ_p
2. ρ_f
3. $(\rho_p - \rho_f)^2$
4. $\rho_p - \rho_f$

Question Number : 137 Question Id : 8946583545 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The flow rate dependent on viscosity (μ) of fluid in a circular pipe under laminar condition is _____.

Options :

1. proportional to μ^2
2. proportional to μ
3. inversely proportional to μ
4. not dependent on μ

Question Number : 138 Question Id : 8946583546 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The ratio of maximum velocity/average velocity for flow between parallel plates is _____.

Options :

1. 1
2. 1.5
3. 2
4. 3

Question Number : 139 Question Id : 8946583547 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For pumps, NPSH stands for _____.

Options :

1. Net Positive Suction Head
2. Net Pump Suction Head
3. Net Positive Standing Head
4. Net Pump Standing Head

Question Number : 140 Question Id : 8946583548 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The pressure drop in a packed bed is given by _____.

Options :

1. Continuity Equation
2. Colebrook Equation
3. Bernoulli Equation
4. Ergun Equation

Question Number : 141 Question Id : 8946583549 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The heat flux across a double layered wall of equal thicknesses and with k_1 and k_2 as thermal conductivities is proportional to _____

Options :

1. $k_1 + k_2$
2. $1/k_1 + 1/k_2$
3. $k_1 \times k_2$
4. k_1/k_2

Question Number : 142 Question Id : 8946583550 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The constant in Fourier's law of heat conduction is _____.

Options :

1. specific heat capacity
2. thermal diffusivity
3. thermal conductivity
4. heat transfer coefficient

Question Number : 143 Question Id : 8946583551 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The temperature of air inside a room is 25°C and outside air is at 40°C . If the thickness of glass window is 1 cm then what is the heat flux across the glass wall whose thermal conductivity is $1\text{ W/m}^\circ\text{C}$?

Options :

1. 1500 W/m^2
2. 2500 W/m^2
3. 4000 W/m^2
4. 6500 W/m^2

Question Number : 144 Question Id : 8946583552 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The full form LMTD for heat exchangers is _____.

Options :

1. Local Measured Temperature Difference
2. Log Measure Temperature Difference
3. Local Mean Temperature Difference
4. Log Mean Temperature Difference

Question Number : 145 Question Id : 8946583553 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The amount of heat required to evaporate 2 kg of water with latent heat of vaporization as 2260 J/gram at atmospheric pressure is _____.

Options :

1. 4520 Joules
2. 2260 Joules
3. 4520 kilo Joules
4. 2260 kilo Joules

Question Number : 146 Question Id : 8946583554 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The formula for Prandtl number is _____

Options :

1. $\mu k/C_p$
2. $C_p \mu /k$
3. $C_p k/\mu$
4. $C_p /\mu k$

Question Number : 147 Question Id : 8946583555 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The flow of fluid in Natural convection is due to _____

Options :

1. Buoyancy
2. External force
3. Centrifugal force
4. Centripetal force

Question Number : 148 Question Id : 8946583556 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The transfer of heat from sun to earth is due to _____

Options :

1. forced convection
2. conduction
3. radiation
4. natural convection

Question Number : 149 Question Id : 8946583557 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The addition of NaCl salt to water has the following effect on boiling point of the solution at atmospheric pressure.

Options :

1. increases
2. decreases
3. no effect
4. makes it 0 °C

Question Number : 150 Question Id : 8946583558 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A black body by definition has emissivity of _____.

Options :

1. 0
2. 0.25
3. 0.75
4. 1

Question Number : 151 Question Id : 8946583559 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The sphericity of a particle based on volume V_p , diameter d_p and surface are S_p is calculated as per following formula

Options :

1. $6 V_p/S_p$
2. $6 (d_p S_p)/V_p$
3. $6 V_p/(d_p S_p)$
4. $6/d_p$

Question Number : 152 Question Id : 8946583560 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For crushing of solids, Kick's law states that the work required is proportional to _____.

Options :

1. square root of surface-to-volume ratio of product
2. new surface created
3. constant for the same reduction ratio
4. square root of equivalent diameter of product

Question Number : 153 Question Id : 8946583561 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A Jet Mill uses the following force for operation

Options :

1. metal balls
2. compressed air or water
3. hammers
4. jaws

Question Number : 154 Question Id : 8946583562 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Froth floatation uses the principle of separating _____.

Options :

1. low and high dielectric material
2. large and small sized material
3. magnetic and non-magnetic material
4. hydrophobic and hydrophilic material

Question Number : 155 Question Id : 8946583563 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A ball mill is used for _____.

Options :

1. grinding
2. cutting
3. tearing
4. crushing

Question Number : 156 Question Id : 8946583564 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The ratio of area of opening in two successive screens in a Tyler standard screens is _____.

Options :

1. 1
2. 2
3. 3
4. 4

Question Number : 157 Question Id : 8946583565 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In cake filtration, the resistance to flow changes with increase in filter cake thickness as follows

Options :

1. remains zero
2. remains constant
3. increases
4. decreases

Question Number : 158 Question Id : 8946583566 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a Rotary Vacuum Drum Filter, the drum is immersed to the following extent in the slurry to be filtered

Options :

1. not at all
2. deep inside
3. fully
4. partly

Question Number : 159 Question Id : 8946583567 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An ideal gas at temperature T_1 and pressure P_1 is compressed isothermally to pressure P_2 ($>P_1$) in a closed system. Which of the following is true for internal energy (U) and Gibbs free energy (G) of the gas at the two states?

Options :

1. $U_1=U_2, G_1>G_2$
2. $U_1=U_2, G_1<G_2$
3. $U_1>U_2, G_1=G_2$
4. $U_1<U_2, G_1=G_2$

Question Number : 160 Question Id : 8946583568 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For one mole of an ideal gas expanding isothermally to twice its volume, the work obtained is equal to _____.

Options :

1. $RT\ln 2$
2. $RT\ln(1/2)$
3. $2RT$
4. $4RT$

Question Number : 161 Question Id : 8946583569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The latent heat of vaporization of water is 2257 kJ/kg at 100 °C. The critical temperature of water is 647.1 Kelvin. The latent heat of vaporization of water at 300 °C is approximately equal to _____.

Options :

1. 2257 kJ/kg
2. 1373 kJ/kg

3. 0 kJ/kg
4. 1494 kJ/kg

Question Number : 162 Question Id : 8946583570 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The kinetic energy of gas molecules is zero at _____.

Options :

1. 0 °C
2. 273 °C
3. 100 °C
4. -273 °C

Question Number : 163 Question Id : 8946583571 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The sequence in which three CSTR's of volumes 5, 10 and 15 m³ will be connected in series to obtain the maximum production in a second order irreversible reaction is _____.

Options :

1. 15, 10, 5
2. 5, 10, 15
3. 10, 5, 15
4. 10, 15, 5

Question Number : 164 Question Id : 8946583572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For a mixed flow reactor operating at steady state, the rate of reaction is given by _____.

Options :

1. $\frac{F_{A0}}{V} - \frac{dC_A}{dt}$

2. $\frac{F_{A0}}{V} + \frac{dC_A}{dt}$

3. $\frac{F_{A0}X_A}{V}$

4. $\frac{-dC_A}{dt}$

Question Number : 165 Question Id : 8946583573 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

For the gases reaction $2A \rightarrow B$ where the feed consists of 50 mol% A and 50 mole% inerts, the expansion factor is _____.

Options :

1. 1

2. -0.5

3. -0.25

4. 0

Question Number : 166 Question Id : 8946583574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The dimension of rate constant for reaction $3A \rightarrow B$ are (l/g mole)/min. Therefore, the reaction order is _____.

Options :

1. 0

2. 1

3. 2

4. 3

Question Number : 167 Question Id : 8946583575 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The units of diffusion constant in mass transfer are _____.

Options :

1. m^2/s^2
2. m/s
3. m^2/s
4. m/s^2

Question Number : 168 Question Id : 8946583576 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The value of relative volatility of A in a vapour-liquid system can be obtained as _____.

Options :

1. P_A^{sat}/P_B^{sat}
2. P_B^{sat}/P_A^{sat}
3. P_A^{sat}/P_{total}
4. P_B^{sat}/P_{total}

Question Number : 169 Question Id : 8946583577 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The nature of q-line for saturated liquid feed mixture in McCabe-Thiele method is _____.

Options :

1. horizontal
2. vertical
3. slope = -1
4. slope = 1

Question Number : 170 Question Id : 8946583578 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a flash distillation of a mixture of 10 moles of A & B feed has 50 mole% of A.

The Vapor is 2 moles and it has 90 mole% A. The mole% of A in Liquid is _____.

Options :

1. 10
2. 20
3. 30
4. 40

Question Number : 171 Question Id : 8946583579 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The dimensionless number in mass transfer that is similar to Prandtl number in heat transfer is _____.

Options :

1. Reynolds number
2. Stanton number
3. Schmidt number
4. Sherwood number

Question Number : 172 Question Id : 8946583580 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

In a binary system of A & B, the mole fraction of A is 0.8 in Vapour and 0.2 in Liquid.

The value of relative volatility of A is _____.

Options :

1. 2
2. 4
3. 8
4. 16

Question Number : 173 Question Id : 8946583581 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The value of moisture content of a wet solid below which it cannot be dried by using atmospheric air is called as _____.

Options :

1. equilibrium moisture content
2. critical moisture content
3. saturated moisture content
4. unbound moisture content

Question Number : 174 Question Id : 8946583582 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is not obtained from Crystallization?

Options :

1. NaOH flakes
2. NaCl salt
3. Polymer
4. Sugar

Question Number : 175 Question Id : 8946583583 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The number of actual trays required (N_a) and theoretical trays estimated (N_t) are related through tray efficiency η as _____.

Options :

1. $N_a = N_t / \eta^2$
2. $N_a = N_t / \eta$
3. $N_a = N_t \eta$
4. $N_a = N_t \eta^2$

Question Number : 176 Question Id : 8946583584 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

According to Raoult's law the partial pressure (p_A) of a component A in vapour in terms of its mole fraction x_A and its saturation vapour pressure p_A^{sat} is given by ___.

Options :

1. $p_A = x_A^4 P_A^{\text{sat}}$
2. $p_A = x_A^3 P_A^{\text{sat}}$
3. $p_A = x_A^2 P_A^{\text{sat}}$
4. $p_A = x_A P_A^{\text{sat}}$

Question Number : 177 Question Id : 8946583585 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

McCabe-Thiele method makes the following assumption regarding the two components in a Binary distillation

Options :

1. equal latent heat of vaporization
2. equal saturation vapour pressure
3. equal molecular weight
4. mole ratio of one

Question Number : 178 Question Id : 8946583586 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The analytical expression used to estimate the minimum number of trays for a distillation column is _____.

Options :

1. McCabe-Thiele equation
2. Ponchon-Savarit equation
3. Fenske Equation

4. Murphree equation

Question Number : 179 Question Id : 8946583587 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

An inclined manometer is _____ sensitive than a U tube manometer

Options :

1. More
2. Less
3. Equal
4. unpredictable

Question Number : 180 Question Id : 8946583588 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the following Group-I with Group-II

Group-I	Group-II
(I) Mercury-in-glass thermometer	(a) Affinity of different constituents to an adsorbent
(II) Gas chromatograph	(b) Cubical expansion of liquids
(III) Optical pyrometer	(c) Faraday's law
(IV) Magneto-Hydrodynamic flow meter	(d) Wien's law

Options :

1. (I)-(a), (II)-(b), (III)-(c), (IV)-(d)
2. (I)-(d), (II)-(c), (III)-(b), (IV)-(a)
3. (I)-(b), (II)-(c), (III)-(d), (IV)-(a)
4. (I)-(b), (II)-(a), (III)-(d), (IV)-(c)

Question Number : 181 Question Id : 8946583589 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

On-off control is a particular case of _____.

Options :

1. proportional-integral-derivative control
2. proportional-derivative control
3. proportional-integral control
4. proportional control

Question Number : 182 Question Id : 8946583590 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is employed as a reference electrode in pH measurement?

Options :

1. Glass electrode
2. Hydrogen electrode
3. Antimony electrode
4. Hg-calomel electrode

Question Number : 183 Question Id : 8946583591 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Typical example of a physical system with underdamped characteristics is a _____.

Options :

1. U-Tube manometer
2. Spring loaded diaphragm valve
3. CSTR with first-order reaction
4. Thermocouple kept immersed in a liquid-filled thermowell

Question Number : 184 Question Id : 8946583592 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Match the type of controller given in Group-II that is most suitable for each application given in Group-I.

Group-I	Group-II
P. Distillation column bottoms level to be controlled with bottoms flow	(I) P controller
Q. Distillation column pressure to be controlled by manipulating vapour flow from the top plate	(II) P-I controller
R. Flow control of a liquid from a pump by positioning the valve in the line	(III) P-I-D Controller
S. Control of temperature of a CSTR with coolant flow in the jacket	

Options :

1. P-(I), Q-(I), R-(II), S-(III)
2. P-(II), Q-(II), R-(III), S-(III)
3. P-(II), Q-(II), R-(I), S-(I)
4. P-(II), Q-(III), R-(II), S-(III)

Question Number : 185 Question Id : 8946583593 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The roots of the characteristic equation of an underdamped second order system are _____.

Options :

1. real, negative and equal
2. real, negative and unequal
3. real, positive and unequal
4. complex conjugates

Question Number : 186 Question Id : 8946583594 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A second order system is free of any damping for damping factor of _____.

Options :

1. unity
2. infinity
3. less than unity
4. zero

Question Number : 187 Question Id : 8946583595 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following gases is the most dangerous to lungs?

Options :

1. O₂
2. N₂
3. CO₂
4. CO

Question Number : 188 Question Id : 8946583596 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following is used in automobiles to oxidize CO to CO₂ completely?

Options :

1. Cyclotron
2. Synchrotron
3. Catalytic converter
4. Electrostatic precipitator

Question Number : 189 Question Id : 8946583597 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

What is the full form of COD in relation to wastewater analysis?

Options :

1. Chemical Oxygen Diffusion
2. Chemical Oxygen Demand
3. Carbon Oxygen Demand
4. Carbon Oxygen Diffusion

Question Number : 190 Question Id : 8946583598 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Water Act was enacted in India for first time in _____.

Options :

1. 1974
2. 1984
3. 1994
4. 2004

Question Number : 191 Question Id : 8946583599 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The gas coming from combustion of coal is called as _____.

Options :

1. flue gas
2. synthesis gas
3. laughing gas
4. ideal gas

Question Number : 192 Question Id : 8946583600 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Electrostatic precipitator uses the following to trap particulate matter from polluted air

Options :

1. gravity
2. flow field
3. magnetic field
4. electric field

Question Number : 193 Question Id : 8946583601 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Which of the following does not increase carbon dioxide in air?

Options :

1. Burning coal
2. Photosynthesis
3. Diesel engine
4. Petrol engine

Question Number : 194 Question Id : 8946583602 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Coke ovens are built of _____.

Options :

1. Silica bricks
2. Fire clay bricks
3. Magnesite bricks
4. Aluminium

Question Number : 195 Question Id : 8946583603 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Besides calorific value, bomb calorimeter is also used to determine _____.

Options :

1. Sulphur
2. Nitrogen
3. Hydrogen in coal
4. Oxygen

Question Number : 196 Question Id : 8946583604 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A suitably designed coal-fired furnace, if properly maintained and operated can give overall thermal efficiency of the order of _____.

Options :

1. 15-20%
2. 25-30%
3. 35-40%
4. 50-55%

Question Number : 197 Question Id : 8946583605 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

The air requirement will be highest for combustion of 1 m^3 of _____.

Options :

1. blast furnace gas
2. water gas
3. producer gas
4. coke oven gas

Question Number : 198 Question Id : 8946583606 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

A coal containing higher amount of volatile matter will have _____.

Options :

1. low ash fusion point
2. high calorific value
3. high caking index
4. very low ash content

Question Number : 199 Question Id : 8946583607 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Natural gasoline is _____.

Options :

1. a refinery product
2. obtained freely in the nature
3. a by product of coal carbonisation
4. obtained by stripping natural gas

Question Number : 200 Question Id : 8946583608 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Coal washing is done to _____.

Options :

1. decrease the mineral matter
2. decrease the moisture content
3. decrease the ash content
4. increase caking properties