Andhra Pradesh State Council of Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Civil Engineering 20th June 2023 Shift 1
Duration :	180
Total Marks :	200
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No

Show Progress Bar :   No

Is this Group for Examiner? :   No

Examiner permission :   Cant View

Show Progress Bar? :   No

Mathematics

Section Id :   418099364

Section Number :   1

Mandatory or Optional :   Mandatory

Number of Questions :   50

Section Marks :   50

Enable Mark as Answered Mark for Review and Clear Response :   Yes

Maximum Instruction Time :   0

Is Section Default? :   null

Question Number : 1 Question Id : 41809918203 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\Delta = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+y \end{vmatrix}$ for x≠0 and y≠0, then Δ is

Options :

1. ✖   Divisible by x but not y

2. ✖   Divisible by y but not x

3. ✔

Divisible by both x & y

Divisible by neither x nor y

4. ✖

Question Number : 2 Question Id : 41809918204 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x^a y^b = e^m$ and $x^c y^d = e^n$, $\Delta_1 = \begin{vmatrix} m & b \\ n & d \end{vmatrix}$, $\Delta_2 = \begin{vmatrix} a & m \\ c & n \end{vmatrix}$ and $\Delta_3 = \begin{vmatrix} a & b \\ c & d \end{vmatrix}$

Then the values of x and y are

Options :

1. ✖ $\dfrac{\Delta_1}{\Delta_3}$ and $\dfrac{\Delta_2}{\Delta_3}$

2. ✖ $\dfrac{\Delta_2}{\Delta_1}$ and $\dfrac{\Delta_3}{\Delta_1}$

3. ✖ $\log\left(\dfrac{\Delta_1}{\Delta_3}\right)$ and $\log\left(\dfrac{\Delta_2}{\Delta_3}\right)$

4. ✔ $e^{\left(\frac{\Delta_1}{\Delta_3}\right)}$ and $e^{\left(\frac{\Delta_2}{\Delta_3}\right)}$

Question Number : 3 Question Id : 41809918205 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

If $A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & a & 1 \end{bmatrix}$ and $A^{-1} = \begin{bmatrix} 1/2 & 1/2 & 1/2 \\ -4 & 3 & c \\ 5/2 & -3/2 & 1/2 \end{bmatrix}$ then the values of

a and c are equal to

Options :

1. ✖ 1 and 1

2. ✔ 1 and -1

3. ✖ 1 and 2

4. ✖ -1 and 1

Question Number : 4 Question Id : 41809918206 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $adj\ B = A$, $|P| = |Q| = 1$ then $adj\left(Q^{-1}BP^{-1}\right)$ is

Options :

1. ✖ PQ

2. ✖ QAP

3. ✔ PAQ

4. ✖ $PA^{-1}Q$

Question Number : 5 Question Id : 41809918207 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of x if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfies the equation

$A^T A = I$

Options :

1. ✔ $\pm \dfrac{1}{\sqrt{2}}$

2. ✖ $\pm \dfrac{1}{\sqrt{3}}$

3. ✖ $\pm \dfrac{1}{\sqrt{6}}$

4. ✖ $\pm \dfrac{1}{2\sqrt{2}}$

Question Number : 6 Question Id : 41809918208 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\dfrac{(x+1)}{(x-a)(x-3)} = \dfrac{2}{x-a} + \dfrac{b}{x-3}$ then $(a,b)=$

Options :

1. ✖ $(-4,1)$

2. ✔ $(7,-1)$

3. ✖ $(4,1)$

4. ✖ $(-4,-1)$

Question Number : 7 Question Id : 41809918209 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\dfrac{(x+1)^2}{x^3+x} = \dfrac{A}{x} + \dfrac{Bx+C}{x^2+1}$, then $\sin^{-1}\left(\dfrac{A}{C}\right)=$

Options :

1. ✖ $\dfrac{\pi}{2}$

2. ✖ $\dfrac{\pi}{3}$

3. ✖ $\dfrac{\pi}{4}$

4. ✔ $\dfrac{\pi}{6}$

Question Number : 8 Question Id : 41809918210 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $4n\alpha = \pi$, then $\cot\alpha \cot 2\alpha \cot 3\alpha \ldots \cot(2n-1)\alpha$ *is equal to*

Options :

1. ✔ 1

2. ✖ -1

3. ✖ ∞

4. ✖ π

Question Number : 9 Question Id : 41809918211 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\dfrac{\tan 3A}{\tan A} = k$, *then* $\dfrac{\sin 3A}{\sin A}$ *is equal to*

Options :

1. ✖ $\dfrac{2k}{k-1}, k \in R$

2. ✖ $\dfrac{2k}{k-1}$, $k \in [1/3 , 3]$

3. ✔ $\dfrac{2k}{k-1}$, $k \notin [1/3 , 3]$

4. ✖ $\dfrac{k-1}{2k}$, $k \notin [1/3 , 3]$

Question Number : 10 Question Id : 41809918212 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If two angles of a $\Delta\ ABC$ are 45° and 60° then the ratio of smallest to greatest sides are

Options :

1. ✔ $(\sqrt{3}-1) : 1$

2. ✖ $\sqrt{3} : \sqrt{2}$

3. ✖ $1 : \sqrt{3}$

4. ✖ $\sqrt{3} : 1$

Question Number : 11 Question Id : 41809918213 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

If $\sin^{-1} x + \sin^{-1} y = \dfrac{2\pi}{3}$ then $\cos^{-1} x + \cos^{-1} y =$

Options :

1. ✖ $\dfrac{2\pi}{3}$

2. ✔ $\dfrac{\pi}{3}$

3. ✖ $\dfrac{\pi}{6}$

4. ✖ π

Question Number : 12 Question Id : 41809918214 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\tan\{\sin^{-1}(\cos(\sin^{-1} x))\} \tan\{\cos^{-1}(\sin(\cos^{-1} x))\}$, where

$0 < x < \pi/2$, is equal to

Options :

1. ✖ 0

2. ✔ 1

3. ✖ -1

4. ✖ 2

Question Number : 13 Question Id : 41809918215 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $0 \le x, y \le 2\pi$ *and* $\sin x + \sin y = 2$, *then* $x + y =$

Options :

1. ✔ π

2. ✖ $\dfrac{\pi}{2}$

3. ✖ $\dfrac{\pi}{4}$

4. ✖ 3π

Question Number : 14 Question Id : 41809918216 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\sec \alpha$ *and* $\csc \alpha$ *are the roots of* $x^2 - px + q = 0$, *then*

Options :

1. ✖ $p^2 = q(q - 2)$

2. ✔ $p^2 = q(q+2)$

3. ✘ $p^2 + q^2 = 2q$

4. ✘ $p^2 + q^2 = q$

Question Number : 15 Question Id : 41809918217 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\cos\left(\dfrac{1}{2}\cos^{-1}\dfrac{1}{8}\right)$ is

Options :

1. ✔ $\dfrac{3}{4}$

2. ✘ $\dfrac{3}{8}$

3. ✘ $\dfrac{1}{16}$

4. ✘ $\dfrac{1}{4}$

Question Number : 16 Question Id : 41809918218 Display Question Number : Yes Is Question

If in ΔABC, sides a, b, c are in A.P. , then

Options :

1. ✖ $B > 60°$

2. ✔ $B \leq 60°$

3. ✖ $B = |A - C|$

4. ✖ $B = 90°$

Question Number : 17 Question Id : 41809918219 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In ΔABC if $b^2 + c^2 = 2a^2$, then the value of $\dfrac{\cot A}{\cot B + \cot C}$ is

Options :

1. ✔ $\dfrac{1}{2}$

2. ✖ $\dfrac{3}{2}$

3. ✖

$$\frac{5}{2}$$

4. ✖ $\frac{5}{3}$

Question Number : 18 Question Id : 41809918220 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Given that $z = (1+i\sqrt{3})^{100}$, then $\left(\dfrac{\text{Re}(z)}{\text{Im}(z)}\right) =$

Options :

1. ✖ 2^{100}

2. ✖ 2^{50}

3. ✔ $\dfrac{1}{\sqrt{3}}$

4. ✖ $\sqrt{3}$

Question Number : 19 Question Id : 41809918221 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Sum of the common roots of the equations

$z^3 + 2z^2 + 2z + 1 = 0$ *and* $z^{1985} + z^{100} + 1 = 0$ is

Options :

1. ✔ -1

2. ✘ 1

3. ✘ 0

4. ✘ 2

Question Number : 20 Question Id : 41809918222 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Equation of the circle which passes through $(1, 0)$ *and* $(0, 1)$ and has its

radius as small as possible is

Options :

1. ✔ $x^2 + y^2 - x - y = 0$

2. ✘ $x^2 + y^2 = 1$

3. ✘ $2x^2 + 2y^2 - 3x - 3y + 1 = 0$

$$x^2 + y^2 - 4x - 4y + 3 = 0$$

4. ✖

Question Number : 21 Question Id : 41809918223 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The focal distance of the point (x, y) on the parabola $x^2 - 8x + 16y = 0$ is

Options :

1. ✖ $|x - 5|$

2. ✖ $|y - 5|$

3. ✖ $|x + 5|$

4. ✔ $|y + 5|$

Question Number : 22 Question Id : 41809918224 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area of the greatest rectangle that can be inscribed in the ellipse

$$\frac{x^2}{9} + \frac{y^2}{4} = 1 \text{ is}$$

Options :

1. ✔ 12 sq. units

2. ✖   8   sq. units

3. ✖   15   sq. units

4. ✖   4   sq.units

Question Number : 23 Question Id : 41809918225 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The eccentricity of the ellipse $16x^2 + 25y^2 = 400$ is

Options :

1. ✖   2/3

2. ✔   3/5

3. ✖   4/3

4. ✖   1/5

Question Number : 24 Question Id : 41809918226 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The axes of an ellipse are coordinate axes, distance between directrices is 32.

Then the equation of the ellipse , if the distance between the foci is 8 is

Options :

1. ✖ $\dfrac{x^2}{64} + \dfrac{y^2}{32} = 1$

2. ✖ $\dfrac{x^2}{64} + \dfrac{y^2}{16} = 1$

3. ✔ $\dfrac{x^2}{64} + \dfrac{y^2}{48} = 1$

4. ✖ $\dfrac{x^2}{64} + \dfrac{y^2}{8} = 1$

Question Number : 25 Question Id : 41809918227 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The length of the transverse axis of the hyperbola $4x^2 - 9y^2 + 8x + 40 = 0$ is

Options :

1. ✖ 8

2. ✖ 6

3. ✔ 4

4. ✖ 5

Question Number : 26 Question Id : 41809918228 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(x) = \dfrac{1}{3}\left(f(x+1) + \dfrac{5}{f(x+2)} \right)$ and $f(x) > 0$ then for all $x \in R$, then

for $\displaystyle \lim_{x \to \infty} f(x) =$

Options :

1. ✖ 0

2. ✖ $\sqrt{\dfrac{2}{5}}$

3. ✔ $\sqrt{\dfrac{5}{2}}$

4. ✖ ∞

Question Number : 27 Question Id : 41809918229 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If α and β are the roots of $ax^2 + bx + c = 0$ then $\lim\limits_{x \to \alpha} (1 + ax^2 + bx + c)^{1/(x-\alpha)}$ is

Options :

1. ✖ $a(\alpha - \beta)$

2. ✖ $\ln |a(\alpha - \beta)|$

3. ✔ $e^{a(\alpha - \beta)}$

4. ✖ $e^{|a(\alpha - \beta)|}$

Question Number : 28 Question Id : 41809918230 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The derivative of $\sin^{-1}\left(\dfrac{2x}{1+x^2}\right)$ with respect to $\tan^{-1}\left(\dfrac{2x}{1-x^2}\right)$

Options :

1. ✖ 0

2. ✔ 1

3. ✖ $\dfrac{1}{1-x^2}$

4. ✖ $\dfrac{1}{1+x^2}$

Question Number : 29 Question Id : 41809918231 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x^y \cdot y^x = 16$ then $\dfrac{dy}{dx}$ at $(2,2)$ is

Options :

1. ✔ -1

2. ✖ 0

3. ✖ 1

4. ✖ -2

Question Number : 30 Question Id : 41809918232 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area if the triangle formed by positive x – axis , and the normal and

tangent to the circle $x^2 + y^2 = 4$ at $\left(1, \sqrt{3}\right)$ is

Options :

1. ✖

$\sqrt{3}$ sq. units

2. ✔ $2\sqrt{3}$ sq. units

3. ✘ $4\sqrt{3}$ sq. units

4. ✘ $\sqrt{3}/2$ sq. units

Question Number : 31 Question Id : 41809918233 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = \log_{\sin x}(\tan x)$ then $\left(\dfrac{dy}{dx}\right)_{\pi/4} =$

Options :

1. ✘ $\dfrac{4}{\log 2}$

2. ✘ $-4 \log 2$

3. ✔ $\dfrac{-4}{\log 2}$

4. ✘ $2 \log 4$

Question Number : 32 Question Id : 41809918234 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If there is an error of 0.05 cm in the side of a cube 10 cm, then the error in its

surface area is

Options :

1. ✔ 6 cm^2

2. ✘ 5 cm^2

3. ✘ 12 cm^2

4. ✘ 3 cm^2

Question Number : 33 Question Id : 41809918235 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The curves $4x^2 + 9y^2 = 72$ and $x^2 - y^2 = 5$ at $(3, 2)$

Options :

1. ✘ Touch each other

2. ✔ Cut orthogonally

3.

✖ Intersect at 45°

4. ✖ Intersect at 60 °

Question Number : 34 Question Id : 41809918236 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = x^y$ then $\dfrac{\partial^2 u}{\partial x \partial y} =$

Options :

1. ✔ $x^{y-1}(1 + y \log x)$

2. ✖ $y^{x-1}(1 + y \log x)$

3. ✖ $y^{x-1}(1 - x \log y)$

4. ✖ $x^{y-1}(1 - y \log x)$

Question Number : 35 Question Id : 41809918237 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $u = \tan^{-1}(y/x)$ then $x \dfrac{\partial u}{\partial x} + y \dfrac{\partial u}{\partial y} =$

Options :

1. ✔ 0

2. ✖ $\sin 2u$

3. ✖ $\cos u$

4. ✖ $2\tan^{-1}u$

Question Number : 36 Question Id : 41809918238 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$$If \int f(x)\cos x \, dx = \frac{1}{2}\left[f(x)\right]^{2} + c \ \ then \ f(x) =$$

Options :

1. ✖ x

2. ✔ $\sin x$

3. ✖ $\cos x$

4. ✖ $\tan x$

Question Number : 37 Question Id : 41809918239 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\int_{0}^{11} [x]^3 \, dx$, where $[\bullet]$ denotes the greatest integer function, is

Options :

1. ✖   0

2. ✖   14400

3. ✖   2200

4. ✔   3025

Question Number : 38 Question Id : 41809918240 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The triangle formed by tangent to the curve $f(x) = x^2 + bx - b$ at the point $(1,1)$ and the coordinate axes lies in the first quadrant. If its area is 2 sq.units then the value of b is

Options :

1. ✔ -3

2. ✖ -2

3.

✖   −1

0
4. ✖

Question Number : 39 Question Id : 41809918241 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = \int \dfrac{dx}{(1+x^2)^{\frac{3}{2}}}$ and $y = 0$ *when* $x = 0$ then the value of y when $x = 1$ is

Options :

1. ✔ $\dfrac{1}{\sqrt{2}}$

2. ✖ $\sqrt{2}$

3. ✖ $2\sqrt{2}$

4. ✖ $3\sqrt{2}$

Question Number : 40 Question Id : 41809918242 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\displaystyle\int \dfrac{dx}{\cos^3 x \sqrt{\sin 2x}} = a(\tan^2 x + b)\sqrt{\tan x} + c$, then

Options :

1. ✖ $a = \dfrac{\sqrt{2}}{5}$, $b = \dfrac{1}{\sqrt{5}}$

2. ✔ $a = \dfrac{\sqrt{2}}{5}$, $b = 5$

3. ✖ $a = \dfrac{\sqrt{2}}{5}$, $b = -\dfrac{1}{\sqrt{5}}$

4. ✖ $a = \dfrac{\sqrt{2}}{5}$, $b = \sqrt{5}$

Question Number : 41 Question Id : 41809918243 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\displaystyle\int_{-1}^{1} \tan^{-1} x \; dx$ is

Options :

1. ✔ 0

2. ✖ $\dfrac{\pi}{4}$

3. ✖ $-\dfrac{\pi}{4}$

4. ✖ $\dfrac{\pi}{2}$

Question Number : 42 Question Id : 41809918244 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $S_n = \left[\dfrac{1}{1+\sqrt{n}} + \dfrac{1}{2+\sqrt{2n}} + \dfrac{1}{3+\sqrt{3n}} + \ldots + \dfrac{1}{n+\sqrt{n^2}} \right]$ then $\displaystyle\lim_{n \to \infty} S_n =$

Options :

1. ✖ $\log\ 2$

2. ✔ $\log\ 4$

3. ✖ $\log\ 6$

4. ✖ $\log\ 8$

Question Number : 43 Question Id : 41809918245 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The volume of the solid generated by revolving the ellipse $\dfrac{x^2}{9} + \dfrac{y^2}{16} = 1$ about

the minor axis is_____ cubic units.

Options :

1. ✖ $128\,\pi$

2. ✖ $64\,\pi$

3. ✔ $48\,\pi$

4. ✖ $16\,\pi$

Question Number : 44 Question Id : 41809918246 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The differential equation of all parabolas whose axis are parallel to y-axis is

Options :

1. ✔ $\dfrac{d^3 y}{dx^3} = 0$

2. ✖ $\dfrac{d^2 y}{dx^2} = C$

$$\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2} = 0$$

3. ✘

$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} = C$$

4. ✘

Question Number : 45 Question Id : 41809918247 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Integrating factor of the differential equation $\cos x \dfrac{dy}{dx} + y \sin x = 1$ is

Options :

1. ✘ $\cos x$

2. ✘ $\tan x$

3. ✔ $\sec x$

4. ✘ $\sin x$

Question Number : 46 Question Id : 41809918248 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The differential equation associated with the primitive $ax^2 + by^2 = 1$ is

Options :

1. ✖ $x = y \dfrac{dy}{dx}$

2. ✖ $x + y \dfrac{dy}{dx} = 0$

3. ✔ $x \left(\dfrac{dy}{dx}\right)^2 + xy \dfrac{d^2 y}{dx^2} = y \dfrac{dy}{dx}$

4. ✖ $x = y \dfrac{d^2 y}{dx^2}$

Question Number : 47 Question Id : 41809918249 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The primitive for the differential equation $x\,dy - (y - x)dx = 0$ is

Options :

1. ✖ $\dfrac{x}{y} + \log |x| = C$

2. ✔ $\dfrac{y}{x} + \log |x| = C$

3. ✖ $\dfrac{x}{y} \log |x| = C$

$$x^2 + y^2 = C$$

4. ✗

Question Number : 48 Question Id : 41809918250 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The degree of the differential equation $y = x\dfrac{dy}{dx} + \sqrt{1+\left(\dfrac{dy}{dx}\right)^2}$

Options :

1. ✗   1

2. ✔   2

3. ✗   4

4. ✗   3

Question Number : 49 Question Id : 41809918251 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order of the differential equation corresponding to the primitive

$y = ae^x + be^{2x} + ce^{3x}$ where a, b and c are arbitrary constants

Options :

1. ✗

1

2. ✖   2

3. ✔   3

4   4

4. ✖

Question Number : 50 Question Id : 41809918252 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The complimentary function of the differential equation

$$\frac{d^2 y}{dx^2} + 4\frac{dy}{dx} + 4y = 4\cos x \text{ is}$$

Options :

1. ✖ $y = c_1 \cos 2x + c_2 \sin 2x$

2. ✔ $y = (c_1 + c_2\, x)e^{-2x}$

3. ✖ $y = c_1^{2} + 4c_2 + 4c_3$

4. ✖ $y = 4\cos c_1 x$

Physics

Question Number : 51 Question Id : 41809918253 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The dimension of the ratio of angular momentum and linear momentum is

Options :

1. ✖ L^0

2. ✔ L^1

3. ✖ L^2

$$L^{-1}$$

4. ✖

Question Number : 52 Question Id : 41809918254 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One Fermi is equivalent to

Options :

1. ✖ 10^{-12} meter

2. ✖ 10^{12} meter

3. ✔ 10^{-15} meter

4. ✖ 10^{15} meter

Question Number : 53 Question Id : 41809918255 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cat is situated at point A (0,3,4) and a rat is situated at point B (5,3,-8).

The cat is free to move but the rat is always at rest. Find the minimum

distance travelled by cat to catch the rat

Options :

5 units

1. ✗

12 units

2. ✗

13 units

3. ✔

17 units

4. ✗

Question Number : 54 Question Id : 41809918256 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Find the values of x and y for which vectors $\vec{A} = (6\hat{i} + x\hat{j} - 2\hat{k})$ and

$\vec{B} = (5\hat{i} - 6\hat{j} - y\hat{k})$ may be parallel

Options :

$x=0, \ y=\dfrac{2}{3}$

1. ✗

$x=-\dfrac{36}{5}, \ y=\dfrac{5}{3}$

2. ✔

$x=-\dfrac{15}{3}, \ y=\dfrac{23}{5}$

3. ✗

$$x = \frac{36}{5}, y = \frac{15}{4}$$

4. ✖

Question Number : 55 Question Id : 41809918257 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The velocity of a body moving along a straight line with uniform deceleration 'a' reduces by ¾ of its initial velocity. The total time of motion of the body is

Options :

1. ✔

$$\frac{3u}{4a}$$

2. ✖

$$\frac{4a}{3u}$$

3. ✖

$3u \times 4a$

4. ✖

zero

Question Number : 56 Question Id : 41809918258 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A stone thrown vertically upwards with a speed of 'u' m/s attains a height 'h₁'. Another stone thrown vertically upwards from the same point with a speed of $\frac{u}{3}$ m/s attains a height 'h₂'. Choose the correct relation

Options :

1. ✔ $h_2 = \frac{h_1}{9}$

2. ✖ $h_2 = \frac{h_1}{19}$

3. ✖ $h_2 = \frac{h_1}{3}$

4. ✖ $h_2 = 3h_1$

Question Number : 57 Question Id : 41809918259 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The horizontal range of a projectile is $4\sqrt{3}$ times of its maximum height. Its angle of projection will be

Options :

1. ✔ 30^0

2. ✖ 60^0

3. ✖ 90^0

4. ✖ 45^0

Question Number : 58 Question Id : 41809918260 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The range of a projectile fired at an angle of 15° is 30m. If it is fired with the same speed at an angle of 45°, its range will be

Options :

1. ✖ 50m

2. ✖ 30m

3. ✔ 60m

4. ✖ 100m

Question Number : 59 Question Id : 41809918261 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a body slides down an inclined plane with coefficient of friction as μ,

then its acceleration is given by

Options :

1. ✖ $g(\mu \sin \theta + \cos \theta)$

2. ✖ $g(\mu \sin \theta - \cos \theta)$

3. ✖ $g(\sin \theta + \mu \cos \theta)$

4. ✔ $g(\sin \theta - \mu \cos \theta)$

Question Number : 60 Question Id : 41809918262 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A body is in equilibrium on a rough inclined plane under its own weight. If

the angle of inclination of the inclined plane is 'α' and the angle of friction

is 'λ',then

Options :

1. ✖ $\alpha > \lambda$

2. ✖

$$\alpha > \lambda/2$$

3. ✔

$$\alpha = \lambda$$

4. ✖

$$\alpha \geq \lambda$$

Question Number : 61 Question Id : 41809918263 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ball of mass 1 kg collides with a wall with speed 8 ms^{-1} and rebounds on the same line with the same speed. If mass of the wall is taken as infinite, the work done by the ball on the wall is

Options :

1. ✖ 6 J

2. ✖ 8 J

3. ✖ 9 J

4. ✔ zero

Question Number : 62 Question Id : 41809918264 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A pump motor is used to deliver water at a certain rate from a given pipe.

To obtain thrice as much water from the same pipe in the same time, power

of the motor has to be increased

Options :

1. ✖
      3 times

2. ✖
      9 times

3. ✔
      27 times

4. ✖
      81 times

Question Number : 63 Question Id : 41809918265 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The energy required to accelerate a car from rest to 10 ms^{-1} is E. What

energy will be required to accelerate the car from 10 ms^{-1} to 20 ms^{-1}?

Options :

1. ✖
      E

2. ✔ 3E

3. ✖ 5E

4. ✖ 7E

Question Number : 64 Question Id : 41809918266 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The time period of a simple pendulum of infinite length is (R_e = radius of earth)

Options :

1. ✔ $T = 2\pi\sqrt{\dfrac{R_e}{g}}$

2. ✖ $T = 2\pi\sqrt{\dfrac{2R_e}{g}}$

3. ✖ $T = 2\pi\sqrt{\dfrac{R_e}{2g}}$

4. ✖ $T = \infty$

Question Number : 65 Question Id : 41809918267 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A particle executes SHM of amplitude 5 cm and period 3 s. The velocity of

the particle at a distance 4 cm from the mean position (take $\pi = 3$) is

Options :

1. ✖ 8 cm s^{-1}

2. ✖ 12 cm s^{-1}

3. ✖ 4 cm s^{-1}

4. ✔ 6 cm s^{-1}

Question Number : 66 Question Id : 41809918268 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A particle is executing SHM with amplitude α and has maximum velocity

'v'. Its speed at displacement $\alpha/2$ will be

Options :

1. ✔ 0.866 v

2. ✖   v/2

3. ✖   v

4. ✖   v/4

Question Number : 67 Question Id : 41809918269 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A whistle of frequency 1000 Hz is sounded on a car travelling towards a cliff with velocity of 18 m s^{-1} normal to the cliff. If velocity of sound $= 330$ m s^{-1}, then the apparent frequency of the echo as heard by the car driver is nearly

Options :

1. ✔   1115 Hz

2. ✖   115 Hz

3. ✖   67 Hz

4. ✖   47.2 Hz

Question Number : 68 Question Id : 41809918270 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An open window is a perfect

Options :

Reflector of sound

1. ✖

Absorber of sound

2. ✔

Scatterer

3. ✖

Refractor

4. ✖

Question Number : 69 Question Id : 41809918271 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A gas is found to obey P^2V = constant. The initial temperature and volume are T_0 & V_0. If the gas expands to volume $2V_0$, then the final temperature is

Options :

1. ✔ $\sqrt{2}\, T_0$

2. ✖

$2T_0$

3. ✖

$$\frac{T_0}{2}$$

4. ✖

$$\frac{T_0}{\sqrt{2}}$$

Question Number : 70 Question Id : 41809918272 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The constant in ideal gas equation is known as

Options :

1. ✔

Universal gas constant

2. ✖

Pressure constant

3. ✖

Temperature constant

4. ✖

Boltzmann constant

Question Number : 71 Question Id : 41809918273 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of specific heats for a mono atomic gas is given by

Options :

1. ✖ $\dfrac{7}{5}$

2. ✖ $\dfrac{5}{2}$

3. ✔ $\dfrac{5}{3}$

4. ✖ $\dfrac{9}{5}$

Question Number : 72 Question Id : 41809918274 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two identical samples of a gas are allowed to expand (i) isothermally (ii) adiabatically. Work done is

Options :

1. ✖ More in the adiabatic process

More in the isothermal process

2. ✔

Equal in both processes

3. ✗

No Work done in any process

4. ✗

Question Number : 73 Question Id : 41809918275 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The heat required to raise 0.5 Kg of sand from 30°C to 90 °C is given by

(Specific Heat of sand = 830 J/Kg °C)

Options :

23450J

1. ✗

54560J

2. ✗

4578J

3. ✗

24900J

4. ✔

Question Number : 74 Question Id : 41809918276 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ray of light will undergo total internal reflection if it

Options :

1. ✔

Travels from denser medium to rarer medium & angle of incidence should be greater than critical angle

2. ✖

Travels from rarer medium to denser medium & angle of incidence should be greater than critical angle

3. ✖

Travels from denser medium to rarer medium & angle of incidence should be less than critical angle

4. ✖

Travels from rarer medium to denser medium& angle of incidence should be less than critical angle

Question Number : 75 Question Id : 41809918277 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The expulsion of a magnetic field from the interior of a superconductor , a phenomenon is known as

Options :

1. ✖ Isotopic effect

2. ✖ BCS theory

3. ✔ Meissner effect

4. ✖ London theory

Chemistry

Section Id :	418099366
Section Number :	3
Mandatory or Optional :	Mandatory
Number of Questions :	25
Section Marks :	25
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 76 Question Id : 41809918278 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How many electrons in an atom may have the quantum numbers, n=4,

m= -½ ?

Options :

1. ✗ 1

2. ✗ 2

3. ✔ 16

4. ✗ 32

Question Number : 77 Question Id : 41809918279 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Balmer series of Hydrogen atom corresponds to which spectral region?

Options :

1. ✗ X-ray region

2. ✗ Ultraviolet region

3. ✗ Infrared region

4. ✔ Visible region

Question Number : 78 Question Id : 41809918280 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The electronic configuration of the Cu atom violates which principle?

Options :

1. ✖ Hund's rule

2. ✖ Pauli Exclusion Principle

3. ✔ Aufbau Principle

4. ✖ Heisenberg's Uncertainty Principle

Question Number : 79 Question Id : 41809918281 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As compared to covalent compounds, ionic compounds generally have:

Options :

1. ✖ low melting points and low boiling points

2. ✔ high melting points and high boiling points

3. ✖ low melting points and high boiling points

high melting points and low boiling points

4. ✖

Question Number : 80 Question Id : 41809918282 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The octet rule is not valid for the molecule:

Options :

1. ✖ CO_2

2. ✖ H_2O

3. ✖ O_2

4. ✔ CO

Question Number : 81 Question Id : 41809918283 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two solutions of a substance (non-electrolyte) are mixed in the following

manner: 480 mL of 1.5 M first solution, 520 mL of 1.2 M second solution.

What is the molarity of the final mixture?

Options :

1. ✖ 1.20 M

2. ✖ 1.50 M

3. ✖ 2.70 M

4. ✔ 1.344 M

Question Number : 82 Question Id : 41809918284 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equivalent mass of H_3PO_4 in the following equation (let M be the mass of H_3PO_4):

$$H_3PO_4 + Ca(OH)_2 \rightarrow CaHPO_4 + 2H_2O$$
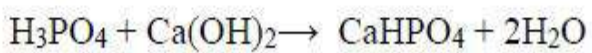
Options :

1. ✖ M

2. ✔ M/2

3. ✖ M/3

4. ✖ 2M

Question Number : 83 Question Id : 41809918285 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The normality of 4% (mass/volume) NaOH solution is

Options :

1. ✖ 0.1 N

2. ✔ 1.0 N

3. ✖ 0.5 N

4. ✖ 0.01 N

Question Number : 84 Question Id : 41809918286 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following cannot function as both Bronsted acid and base?

Options :

1. ✔ HCl

2. ✖ NH_3

3. ✖ HSO_4^-

HCO_3^-

4. ✗

Question Number : 85 Question Id : 41809918287 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following will make a basic buffer?

Options :

1. ✔ 100 mL of 0.1 M HCl + 200 mL of 0.1 M NH_4OH

2. ✗ 100 mL of 0.1 M HCl + 100 mL of 0.1 M NH_4OH

3. ✗ 50 mL of 0.1 M NaOH +25 mL of 0.1 M CH_3COOH

4. ✗ 100 mL of 0.1 M CH_3COOH + 100 mL of 0.1 M NaOH

Question Number : 86 Question Id : 41809918288 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hydrogen gas is not liberated when the following metal is added to dil. HCl.

Options :

1. ✔ Mg

2.

Zn

✖

3. ✖ Ag

4. ✖ Cu

Question Number : 87 Question Id : 41809918289 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The reduction potential of hydrogen half-cell will be negative if:

Options :

1. ✖ $p(H_2) = 1$ atm and $[H^+] = 1$ M

2. ✖ $p(H_2) = 2$ atm and $[H^+] = 2$ M

3. ✖ $p(H_2) = 1$ atm and $[H^+] = 2$ M

4. ✔ $p(H_2) = 2$ atm and $[H^+] = 1$ M

Question Number : 88 Question Id : 41809918290 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

3 faraday of electricity are passed through molten Al_2O_3, aqueous solution of $CuSO_4$ and molten NaCl taken in three different electrolytic cells. The amount of Al, Cu and Na deposited at the cathodes will be in the ratio of:

Options :

1. ✖   1 mole : 2 mole : 3mole

2. ✖   3 mole : 2 mole : 1 mole

3. ✖   1.5 mole : 2 mole : 3 mole

4. ✔   1 mole : 1.5 mole : 3 mole

Question Number : 89 Question Id : 41809918291 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the EMF of cell represented as $Zn(s) / Zn^{2+}(Aq) \parallel H^+(1M)$

$/H_2(1atm)$ if $E^0_{Zn2+/Zn}$ = -0.7618 V

Options :

1. ✔   + 0.7618 V

2. ✖   0.0 V

3. ✖   -0.7618 V

4. ✖ +0.540 V

Question Number : 90 Question Id : 41809918292 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Ion-exchanger, the exhausted cation exchange resin can be regenerated

by washing with:

Options :

1. ✖ dil. NaOH

2. ✔ dil. HCl

3. ✖ Distilled water

4. ✖ Brakish water

Question Number : 91 Question Id : 41809918293 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following is powerful disinfectant?

Options :

1. ✖ O_2

2.

✔ Cl_2

3. ✖ N_2

4. ✖ $CaOCl_2$

Question Number : 92 Question Id : 41809918294 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A sample of water contain temporary hardness of 56.8 mg/L. Express the temporary hardness in terms of e (Clark degrees)

Options :

1. ✖ 56.8 e

2. ✔ 3.976 e

3. ✖ 5.68 e

4. ✖ 811.43 e

Question Number : 93 Question Id : 41809918295 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Tinning is done by:

Options :

1. ✖ Electroplating

2. ✖ Spraying

3. ✔ Hot dipping

4. ✖ Cementation

Question Number : 94 Question Id : 41809918296 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the oxygen supply is limited during the rusting of iron, corrosion product

is:

Options :

1. ✖ Fe_2O_3

2. ✖ $Fe_2O_3 . xH_2O$

3. ✖ $Fe_2O_3 . 2H_2O$

4. ✔ Fe_3O_4

Question Number : 95 Question Id : 41809918297 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Buna-N rubber is made from:

Options :

1. ✖ Butadiene and formaldehyde

2. ✖ Isoprene and Phenol

3. ✔ Butadiene and acrylonitrile

4. ✖ Phenol and styrene

Question Number : 96 Question Id : 41809918298 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A good example of condensation polymer is:

Options :

1. ✖ Teflon

2. ✖ Polythene

3. ✔ Bakelite

4. ✘ Polypropylene

Question Number : 97 Question Id : 41809918299 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vulcanisation of rubber is mainly by the addition of:

Options :

1. ✘ Oxygen gas

2. ✘ Magnesium oxide

3. ✔ Sulphur

4. ✘ Zinc oxide

Question Number : 98 Question Id : 41809918300 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

During the refining of petroleum, which of the following is used to remove

sulphur impurity:

Options :

Copper Oxide

1. ✔

Copper Sulphide

2. ✖

Magnesium chloride

3. ✖

Magnesium sulphate

4. ✖

Question Number : 99 Question Id : 41809918301 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the oxide of nitrogen is not a common pollutant?

Options :

N_2O_5

1. ✔

N_2O

2. ✖

NO

3. ✖

NO_2

4. ✖

Question Number : 100 Question Id : 41809918302 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

DDT is:

Options :

1. ✖ Nitrogen containing insecticide

2. ✖ Biodegradable pollutant

3. ✔ Non-Biodegradable pollutant

4. ✖ An antibiotic

Civil Engineering

Section Id :	418099367
Section Number :	4
Mandatory or Optional :	Mandatory
Number of Questions :	100
Section Marks :	100
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 101 Question Id : 41809918303 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported rectangular beam of splan L and depth d carries a central load W. The ratio of maximum deflection to maximum bending stress is

Options :

1. ✔ $\dfrac{L^2}{6Ed}$

2. ✖ $\dfrac{L^2}{8Ed}$

3. ✖ $\dfrac{L^2}{4Ed}$

4. ✖ $\dfrac{L^2}{12Ed}$
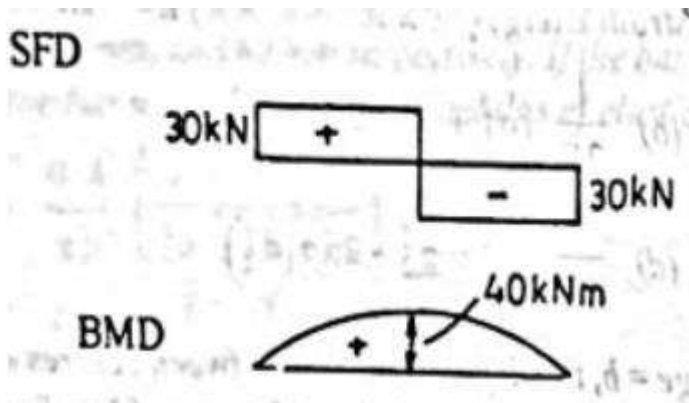
Question Number : 102 Question Id : 41809918304 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam of span carries a point load W at midspan. The breadth 'b' of the beam along the entire span is constant. Given, 'f' = permissible stress is bending, for a beam of uniform strength, the depth of the beam at any cross-section at distance 'x' from the support would be

Options :

1. ✖ $\dfrac{6Wx}{bf}$

$$2. ✖ \quad \sqrt{\dfrac{6Wx}{bf}}$$

$$3. ✖ \quad \dfrac{3Wx}{bf}$$

$$4. ✔ \quad \sqrt{\dfrac{3Wx}{bf}}$$

Question Number : 103 Question Id : 41809918305 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A beam of length 10m carries a udl of 20k/m over its entire length and rests on two simple supported . In order that the maximum BM is the least possible, the supports must be placed from the end at a distance of

Options :

1. ✖   5.86m

2. ✖   4.14m

3. ✖   2.93m

4. ✔   2.07m

Question Number : 104 Question Id : 41809918306 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an experiment it is found that the bulk modulus of a material is equal to its shear modulus.

The poisson's ratio is

Options :

1. ✔   0.125

2. ✖   0.250

3. ✖   0.375

4. ✖   0.500

Question Number : 105 Question Id : 41809918307 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cylindrical bar of 20 mm diameter and 1 m length is subjected to a tensile test. Its longitudinal strain is 4 times that of its lateral strain. If the modulus of elasticity is 2×10^5 N/mm², then its modulus of rigidity will be

Options :

1. ✖ 8×10^6 N/mm²

2. ✖

8×10^5 N/mm²

3. ✗
0.8×10^4 N/mm²

4. ✓
0.8×10^5 N/mm²

Question Number : 106 Question Id : 41809918308 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam is shown in the below figure.
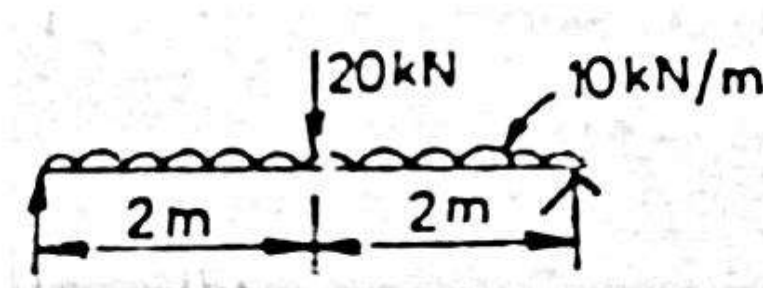
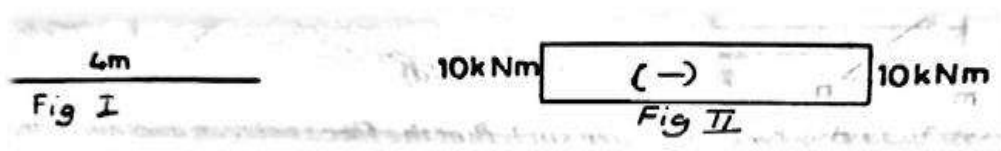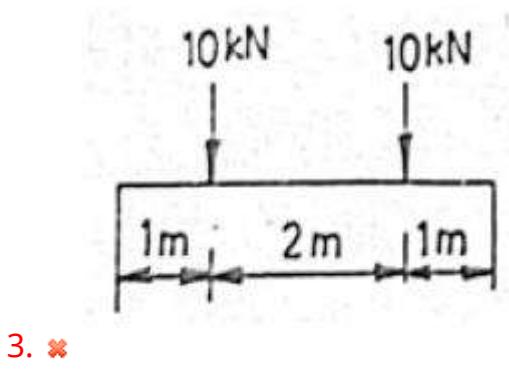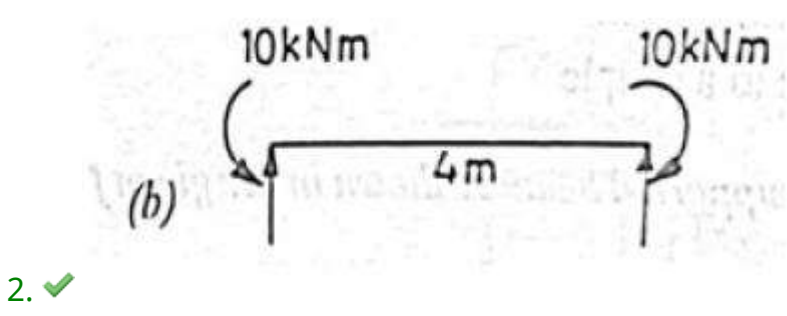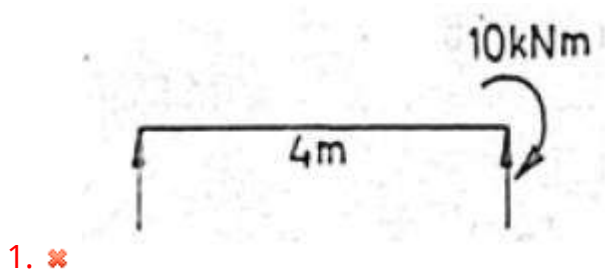The corresponding SFD and BMD would be

Options :

1. ✗

2. ✔

3. ✘

4. ✘
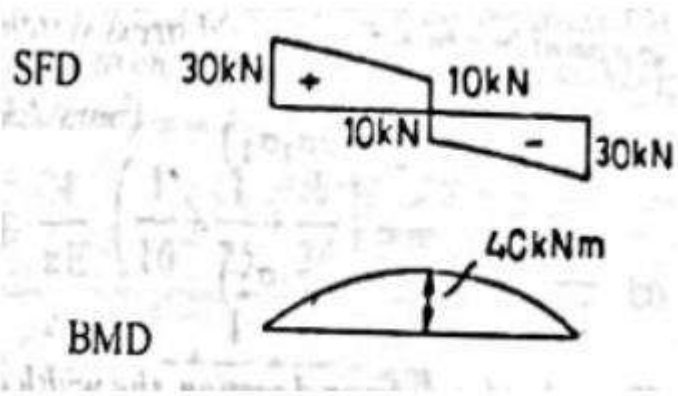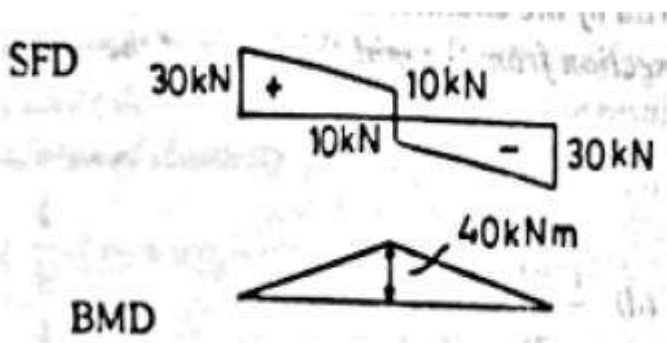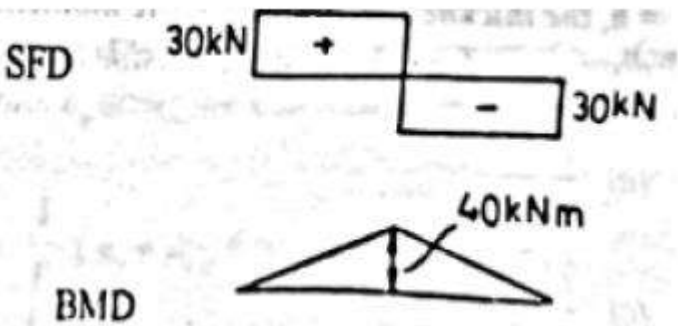
Question Number : 107 Question Id : 41809918309 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

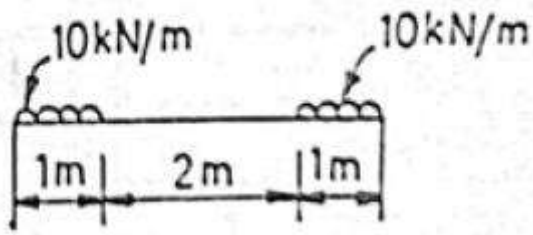A beam's S.F.D. and B.M.D. are shown in figure-1 and figure-2

Fig I

Fig II

The corresponding load diagram will be

Options :

1. ✗

(b)

2. ✓

3. ✗

4. ✗

Question Number : 108 Question Id : 41809918310 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A unique relation between bending moment (M) and intensity of load (w) acting continuously

on a beam of span (L) at a distance (x) along the axis (The flexural rigidity of beam is EI) is given

by

Options :

1. ✖ $M = \dfrac{wL^2}{12}$

2. ✔ $w = \dfrac{d^2 M}{dx^2}$

3. ✖ $M = EI \dfrac{d^2 w}{dx^2}$

4. ✖ $\dfrac{wL^2}{12}$

Question Number : 109 Question Id : 41809918311 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In which one of the following, the point of contraflexure will not occur?

Options :

1. ✖ A two span continuous beam of equal spans, simply supported and loaded by UDL over both spans

2. ✔ A simply supported beam loaded by UDL

3. ✖ A fixed beam loaded by UDL

4. ✖ A propped cantilever loaded by UDL

Question Number : 110 Question Id : 41809918312 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A uniform beam of span I carries a uniformly distributed load w per unit length as shown in the figure given below. The supports are at a distance of x from either end. What is the condition for the maximum bending moment in the beam to be small as possible?

w/unit length
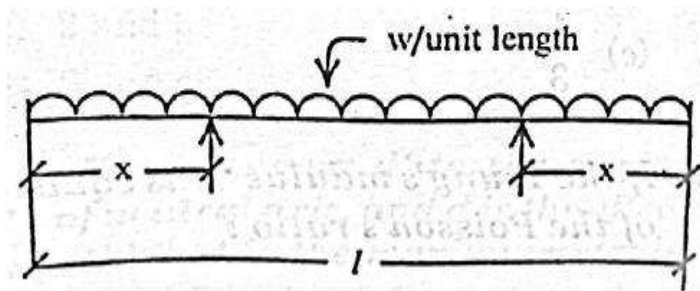
Options :

1. ✗ $x = 0.107\,l$

2. ✔ $x = 0.207\,l$

3. ✗ $x = 0.237\,l$

4. ✗ $x = 0.25\,l$

Question Number : 111 Question Id : 41809918313 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bulk modulus of elasticity of a material is twice its modulus of rigidity. The Poisson's ratio of the material is

Options :

1. ✔ $1/7$

2. ✖ 2/7

3. ✖ 3/7

4. ✖ 4/7

Question Number : 112 Question Id : 41809918314 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A compression member has a centre to centre length of 4.0 m. It is fixed at one end and hinged

at the other end. The effective length of the column is

Options :

1. ✖ 4-0 m

2. ✖ 3.2 m

3. ✔ 2.8 m

4. ✖ 2-6 m

Question Number : 113 Question Id : 41809918315 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

The slenderness ratio of a compression member in the context of Rankine's formula is defined as

Options :

1. ✖
$$\frac{length}{least\ lateral\ dimension}$$

2. ✔
$$\frac{effective\ length}{least\ radius\ of\ gyration}$$

3. ✖
$$\frac{effective\ length}{least\ lateral\ dimension}$$

4. ✖
$$\frac{length}{least\ radius\ of\ gyration}$$

Question Number : 114 Question Id : 41809918316 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bending moment for which the beam shown below is to be designed is
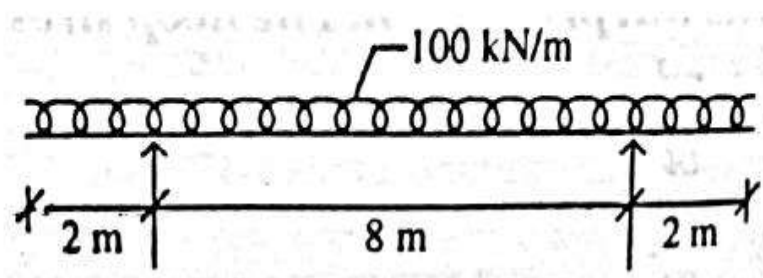
Options :

1. ✖
200 kNm

800 kNm

2. ✖

600 kNm

3. ✔

640 kNm

4. ✖

Question Number : 115 Question Id : 41809918317 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Necking in case of ductile materials begins at the

Options :

elastic limit point

1. ✖

upper yield point

2. ✖

lower yield point

3. ✖

ultimate point

4. ✔

Question Number : 116 Question Id : 41809918318 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of modulus of elasticity for a material in 200 GN/m² and Poisson's ratio is 0.25. What

is its modulus of rigidity?

Options :

1. ✖   250 GN/m²

2. ✖   320 GN/m²

3. ✖   125 GN/m²

4. ✔   80 GN/m²

Question Number : 117 Question Id : 41809918319 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the nature of stress developed in horizontal supporting rod used for hanging a ceiling

fan?

Options :

1. ✖   Bending

2. ✖   Tensile

3. ✖ Compressive

4. ✔ Shear

Question Number : 118 Question Id : 41809918320 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam AB of span L carries two concentrated loads W each at points L/3

from A and B. What is the S.F. in the middle one-third portion of the beam?

Options :

1. ✖ $W/2$

2. ✖ $2W$

3. ✖ W

4. ✔ Zero

Question Number : 119 Question Id : 41809918321 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the ratio of load carrying capacity of a fixed beam to that of a cantilever beam of same span, having same maximum bending moment and loaded with uniformly distributed load throughout the span?
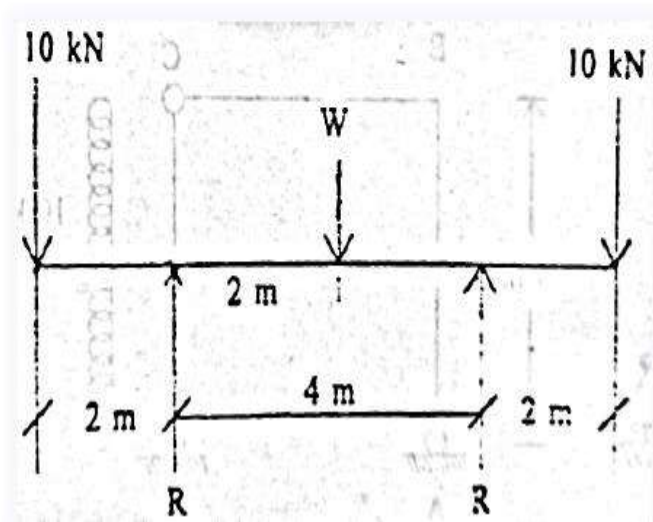
Options :

1. ✔   6

2. ✘   4

3. ✘   3

4. ✘   2

Question Number : 120 Question Id : 41809918322 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A beam of uniform flexural rigidity supports a set of loads as shown in figure below. What is the value of W if the magnitudes of bending moment at midspan and at support of the beam are numerically equal?

10 kN   10 kN

W

2 m

4 m

2 m   2 m

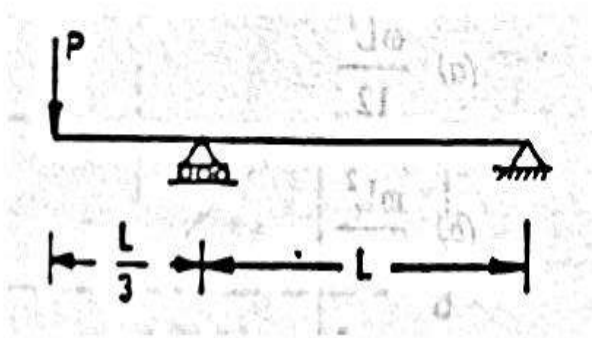R   R

Options :

1. ✖   20 kN

2. ✔   40 kN

3. ✖   60 kN

4. ✖   80 kN

Question Number : 121 Question Id : 41809918323 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An overhang beam of uniform EI is loaded as shown in the below figure. The deflection at the free end will be

Options :

1. ✔ $\dfrac{PL^3}{81EI}$

2. ✖ $\dfrac{PL^3}{27EI}$

3. ✖ $\dfrac{4PL^3}{81EI}$

4. ✖ $\dfrac{2PL^3}{27EI}$

Question Number : 122 Question Id : 41809918324 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The moment at the intermediate (middle) support of a two-span continuous beam of 6m each with simple support at the ends carrying a udl of 20k/m over only the left span (flexural rigidity is the same for both the spans)

Options :

1. ✔ 90kN.m hogging

2. ✘ 45kN.m hogging

3. ✘ 45kN.m sagging

4. ✘ zero

Question Number : 123 Question Id : 41809918325 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The beam ABC shown in the given figure is horizontal. The distance to the point of contraflexure from the end A is
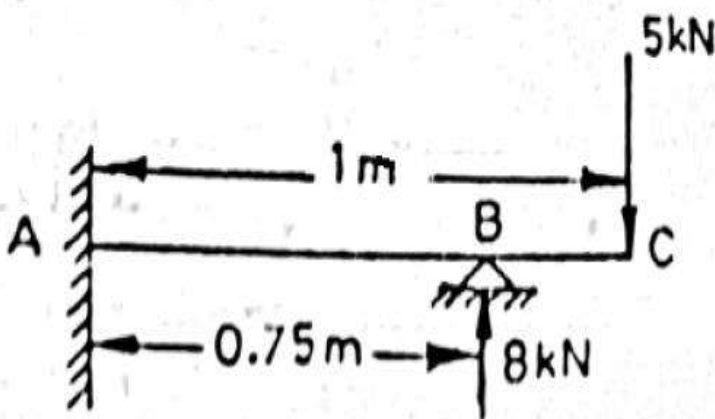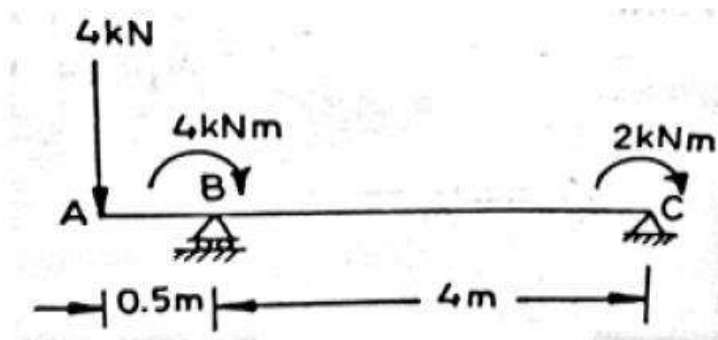

Options :

1. ✔ 0.333m

2. ✖
0.666m

3. ✖
0.25m

4. ✖
0.75m

Question Number : 124 Question Id : 41809918326 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The beam shown in the given figure below has a design bending moment value of

Options :

1. ✖
8kNm

2. ✔
6kNm

3. ✖
4kNm

4. ✖

2kNm

Question Number : 125 Question Id : 41809918327 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A uniform beam of span 'l' is rigidly fixed at both supports. It carries a uniformly distributed load w per unit length. The bending moment at mid span is

Options :

1. ✖ $\dfrac{wl^2}{8}$

2. ✖ $\dfrac{wl^2}{12}$

3. ✖ $\dfrac{wl^2}{16}$

4. ✔ $\dfrac{wl^2}{24}$

Question Number : 126 Question Id : 41809918328 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A straight cantilever of uniform cross-section carries a total load 'W' distributed evenly over its entire length. If the free end of the cantilever is now propped up to the level of the fixed end, the vertical force required at the prop is

Options :

1. ✔ $\dfrac{3}{8}$ W

2. ✖ $\dfrac{5}{8}$ W

3. ✖ $\dfrac{3}{4}$ W

4. ✖ W

Question Number : 127 Question Id : 41809918329 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A beam is hinged at end A and fixed at B. A moment M is applied at end A. What is the moment developed at end B?
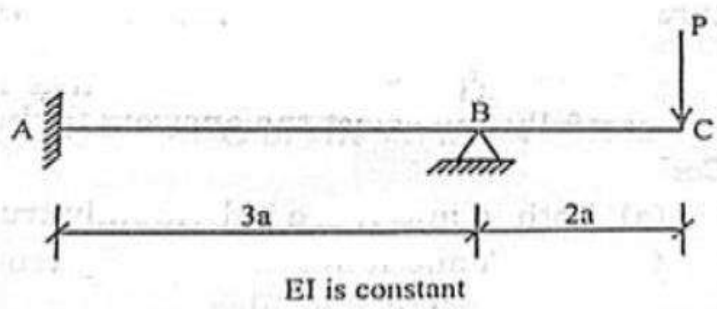
Options :

1. ✖ -M

2. ✖ M

3. ✔ M/2

4. ✘ -M/2

Question Number : 128 Question Id : 41809918330 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the propped cantilever shown in the figure given above, what are the values of the bending

moment and shear force at the support A?

EI is constant

Options :

1. ✘ 2Pa, P/3

2. ✔ Pa, P

3. ✘ Pa, P/3

4. ✘ 2 Pa, 4P/3

Question Number : 129 Question Id : 41809918331 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The deflection at the free end of a uniformly loaded cantilever of length 1ms is 7.5 mm What

is the slope at the free end?

Options :

1. ✔ 0.01 radian

2. ✖ 0.015 radian

3. ✖ 0.02 radian

4. ✖ 0.025 radian

Question Number : 130 Question Id : 41809918332 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Clapeyron's theorem is applied to

Options :

1. ✖ simply supported beam

propped cantilever beam

2. ✖

3. ✔ fixed and continuous beam

continuous beam only

4. ✖

Question Number : 131 Question Id : 41809918333 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A propped cantilever of span 4 m is fixed at A and propped at B. The beam carries a u.d.l. of 1 t/m over the entire span. The reaction at B is

Options :

1. ✖ $\dfrac{5}{2}t$

2. ✖ 2 t

3. ✖ 1 t

4. ✔ $\dfrac{3}{2}t$

Question Number : 132 Question Id : 41809918334 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the magnitude of the force in the member BD in the figure given below?

Options :

1. ✖ 5 kN

2. ✖ 7 kN (approximately)

3. ✖ $4\sqrt{2}$ kN

4. ✔ Zero

Question Number : 133 Question Id : 41809918335 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
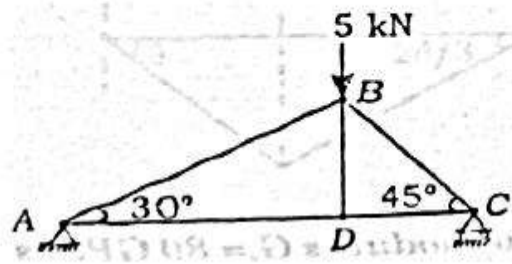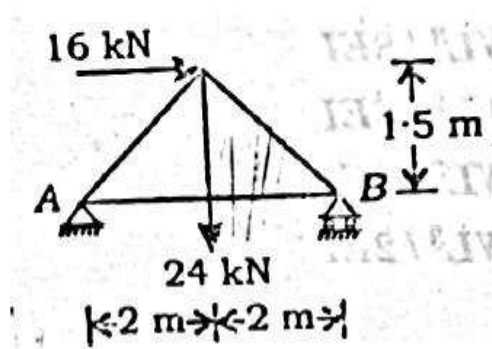
What are the magnitudes of horizontal and vertical support reactions, respectively at support A

of the frame shown below?

Options :

1. ✖   16 kN, 18 kN

2. ✔   16 kN, 6 kN

3. ✖   6 kN, 16 kN

4. ✖   8 kN, 6 kN

Question Number : 134 Question Id : 41809918336 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a masonry dam of base width b, at which location w.r.t. the central line, should the resultant

loading intersect the sections to avoid tension in any horizontal section?

Options :

1. ✖   Outside of b/6
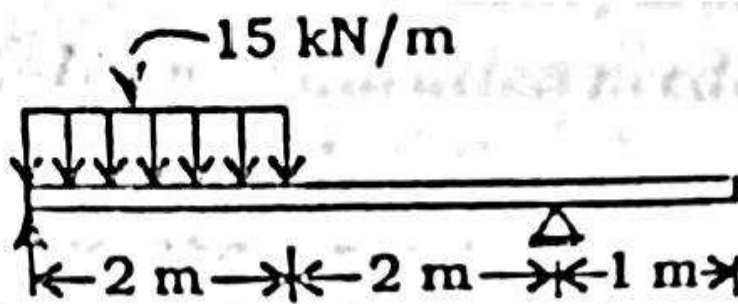
2. ✔ Within b/6

3. ✘ Within b/8

4. ✘ At the central line

Question Number : 135 Question Id : 41809918337 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At what distance from left support of the below beam, is the shear force zero?

Options :

1. ✘ 1 mm

2. ✘ 1.25 m

3. ✔ 1.5 m

2.5 m

4. ✖

Question Number : 136 Question Id : 41809918338 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum deflection of a cantilever of span l carrying a u.d.l. of intensity w per unit

length is

Options :

1. ✖ $\dfrac{wl^4}{4\ EI}$

2. ✔ $\dfrac{wl^4}{8\ EI}$

3. ✖ $\dfrac{wl^4}{12\ EI}$

4. ✖ $\dfrac{wl^4}{24\ EI}$

Question Number : 137 Question Id : 41809918339 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum slope of a cantilever of span l carrying a u.d.l. of intensity w per unit length is

Options :

1. ✖ $\dfrac{Wl^3}{EI}$

2. ✖ $\dfrac{Wl^3}{2\ EI}$

3. ✖ $\dfrac{Wl^3}{3\ EI}$

4. ✔ $\dfrac{Wl^3}{6\ EI}$

Question Number : 138 Question Id : 41809918340 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An elastic prop is one where

Options :

1. ✖ the deflection is zero

2. ✔ the deflection is known

3. ✖ the bending moment is zero

4. ✖ the shear force is zero.

Question Number : 139 Question Id : 41809918341 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum deflection of a fixed beam of span l carrying a concentrated load W at the

centre is

Options :

1. ✖ $\dfrac{Wl^3}{48\ EI}$

2. ✖ $\dfrac{Wl^3}{96\ EI}$

3. ✔ $\dfrac{Wl^3}{192\ EI}$

4. ✖ $\dfrac{Wl^3}{384\ EI}$

Question Number : 140 Question Id : 41809918342 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum deflection of a fixed beam of span l carrying a u.d.l. of intensity w per unit

length is

Options :

1. ✖ $\dfrac{5\ Wl^4}{384\ EI}$

2. ✗ $\dfrac{5\,Wl^4}{48\,EI}$

3. ✗ $\dfrac{5\,Wl^4}{12\,EI}$

4. ✓ $\dfrac{Wl^4}{384\,EI}$

Question Number : 141 Question Id : 41809918343 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A doubly reinforced beam is considered less economical than a singly reinforced beam because

Options :

1. ✗ tensile steel required is more than that for a balanced section

2. ✗ shear reinforced is more

3. ✗ concrete is not stressed to its full value

4. ✓ compressive steel is under-stressed

Question Number : 142 Question Id : 41809918344 Display Question Number : Yes Is Question

lateral ties in RC columns are provided to resist

Options :

bending moment

1. ✖

shear

2. ✖

buckling of longitudinal steel bars

3. ✔

both bending moment and shear

4. ✖

Question Number : 143 Question Id : 41809918345 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Partial safety factor for concrete and steel are 1.5 and 1.15 respectively, because

Options :

concrete is heterogeneous while steel is homogeneous

1. ✖

the control on the quality of concrete is not as good as that of steel

2. ✔

concrete is weak in tension

3. ✖

voids in concrete are 0.5% while those in steel are 0.15%

4. ✖

Question Number : 144 Question Id : 41809918346 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum permissible shear stress $T_{c\,max}$ given in BIS 456-2000 is based on

Options :

1. ✖ diagonal tension failure

2. ✔ diagonal compression failure

3. ✖ flexural tension failure

4. ✖ flexural compression failure

Question Number : 145 Question Id : 41809918347 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The chances of diagonal tension cracks in R.C.C. member reduce when

Options :

axial compression and shear force act simultaneously

1. ✔

axial tension and shear force act simultaneously

2. ✖

only shear force act

3. ✖

flexural and shear force act

4. ✖

Question Number : 146 Question Id : 41809918348 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A rectangular beam of width 100 mm is subjected to a maximum shear force of 60 kN. The

corresponding maximum shear stress in the cross-section is 4 N/mm². The depth of the beam

should be

Options :

150 mm

1. ✔

225 mm

2. ✖

200 mm

3. ✖

4. ✖

100 mm

Question Number : 147 Question Id : 41809918349 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum deflection of simply supported beam occurs at zero

Options :

1. ✖ bending moment location

2. ✖ shear force location

3. ✔ slope location

4. ✖ shear force location and also zero bending moment location

Question Number : 148 Question Id : 41809918350 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In case of two-way slab, the deflection of the slab is

Options :

1. ✖ Primarily a function of the long span

2. ✔ Primarily a function of the short span

3. ✘ Independent of the span, long or short

4. ✘ Mostly long span but sometimes short span

Question Number : 149 Question Id : 41809918351 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A reinforced concrete beam of 10 m effective span and 1 m effective depth is supported on 500 mm x 500 mm columns. If the total uniformly distributed load on the beam is 10 MN/m, the design shear force for the beam is

Options :

1. ✔ 50 MN

2. ✘ 47.5 MN

3. ✘ 37.5 MN

4. ✘ 43 MN

Question Number : 150 Question Id : 41809918352 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Stress-strain curve of concrete is

Options :

1. ✖ A perfect straight line up to failure

2. ✖ Straight line up to 0.002% strain value and then parabolic up to failure

3. ✔ Parabolic up to 0.002% strain value and then a straight line up to failure

4. ✖ Hyperbolic up to 0.002% strain value and then a straight line up to failure

Question Number : 151 Question Id : 41809918353 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The distance between theoretical cut-off point and actual cut-off point in respect of the curtailment of reinforcement of reinforced concrete beams should not be less than

Options :

1. ✖ Development length.

2. ✔ 12 x dia of bar or effective depth whichever is greater.

24 x dia of bar or effective depth whichever is greater.

3. ✖

30 x dia of bar or effective depth whichever is greater.

4. ✖

Question Number : 152 Question Id : 41809918354 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An axially loaded column is of 300 x 300 mm size. Effective length of column is 3 m. What is

the minimum eccentricity of the axial load for the column?

Options :

0

1. ✖

10 mm

2. ✖

16 mm

3. ✖

20 mm

4. ✔

Question Number : 153 Question Id : 41809918355 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

How can shear strength be ensured in a beam?

Options :

1. ✖ By providing binding wire on main bars

2. ✖ By providing HYSD bars instead of mild steel bars

3. ✖ By providing rounded aggregate

4. ✔ By providing stirrups

Question Number : 154 Question Id : 41809918356 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a singly reinforced beam, the tensile steel reaches its maximum allowable stress earlier than concrete. What is such a section known as?

Options :

1. ✔ Under-reinforced section

2. ✖ Over-reinforced section

3. ✖ Balanced section

4. ✖

Economic section

Question Number : 155 Question Id : 41809918357 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Why is the design of a R.C. section as over-reinforced undesirable?

Options :

1. ✖ It consumes more concrete

2. ✖ It undergoes high strains

3. ✔ It fails suddenly

4. ✖ Its appearance is not good

Question Number : 156 Question Id : 41809918358 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the assumption in the steel beam theory of doubly reinforced beams?

Options :

1. ✖ Only steel bars will resist tension

Only concrete will resist tension

2. ✖

Stress in tension steel equals the stress in compression steel

3. ✔

Both concrete and steel will resist compressional

4. ✖

Question Number : 157 Question Id : 41809918359 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the ratio of flexural strength (fcr) to the characteristic compressive strength of concrete

(fck) for M25 grade concrete?

Options :

0.08

1. ✖

0.11

2. ✖

0.14

3. ✔

0.17

4. ✖

Question Number : 158 Question Id : 41809918360 Display Question Number : Yes Is Question

How is the deflection in RC beams controlled as per IS : 456?

Options :

1. ✖ By using large aspect ratio

2. ✖ By using small modular ratio

3. ✔ By controlling span/depth ratio

4. ✖ By moderating water-cement ratio

Question Number : 159 Question Id : 41809918361 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

At what stress does the first flexural crack appear in RCC beams made of M25 grade concrete?

Options :

1. ✖ 3.0 MPa

2. ✔ 3.5 MPa

3. ✖ 4.0 MPa

4.5 MPa

4. ✖

Question Number : 160 Question Id : 41809918362 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the adoptable maximum spacing between vertical stirrups in an RCC beam of rectangular cross-section having an effective depth of 300 mm?

Options :

300 mm

1. ✖

275 mm

2. ✖

250 mm

3. ✖

225 mm

4. ✔

Question Number : 161 Question Id : 41809918363 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As depth of immersion of a vertical plane surface increases, the location of centre of pressure

Options :

comes closer to the centre of gravity of the area

1. ✔

2. ✖ moves apart from the centre of gravity of the area

3. ✖ ultimately coincides with the centre of gravity of the area

4. ✖ remains unaffected

Question Number : 162 Question Id : 41809918364 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Though Manning's formula is dimensionally non-homogeneous, it is commonly used in practice because

Options :

1. ✔ it is in simple form

2. ✖ it was derived from extensive field data

3. ✖ it can be made dimensionally homogeneous

4. ✖ it can be related to Chezy's coefficient or Darcy-Weisbach's friction factor

Question Number : 163 Question Id : 41809918365 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following pressure units represents the LEAST pressure?

Options :

1. ✔   millibar

2. ✖   mm of Hg

3. ✖   N/mm²

4. ✖   kgf/cm²

Question Number : 164 Question Id : 41809918366 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For laminar flow in a pipe carrying a given discharge, the height of surface roughness is doubled. In such a case, Darcy-Weisbach friction factor will

Options :

1. ✔   remain unchanged

2. ✖   be halved

3. ✖   be doubled

4. ✖   increase fourfold

Question Number : 165 Question Id : 41809918367 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The surface tension of water at 20°C is 75 x 10^{-3} N/m. The difference in the water surfaces

within and outside an open-ended capillary tube of 1 mm internal bore, inserted at the water

surface would nearly be

Options :

1. ✖   5 mm

2. ✖   10 mm

3. ✔   15 mm

4. ✖   20 mm

Question Number : 166 Question Id : 41809918368 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coefficient of velocity for an orifice is given by (using usual notations)

Options :

1. ✔ $\dfrac{x}{2\sqrt{yH}}$

2. ✖ $\dfrac{2x}{\sqrt{yH}}$

3. ✖ $\dfrac{x}{\sqrt{yH}}$

4. ✖ $\sqrt{\dfrac{x^2}{2yH}}$

Question Number : 167 Question Id : 41809918369 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A rectangular open channel carries a discharge of 15 m³/s when the depth of flow is 1.5 m and the bed slope is 1:1440. What will be the discharge through the channel at the same depth if the slope would have been 1:1000?

Options :

1. ✖ 21.6 m³/s

2. ✔ 18 m³/s

14.4 m³/s

3. ✖

12.5 m³/s

4. ✖

Question Number : 168 Question Id : 41809918370 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Chezy's coefficient C is related to Darcy-Weisbach friction factor 'f' as

Options :

1. ✖
$$C = \sqrt{\left(\frac{g}{8f}\right)}$$

2. ✖
$$C = \sqrt{(8g/f^{1/4})}$$

3. ✔
$$C = \sqrt{\left(\frac{8g}{f}\right)}$$

4. ✖
$$C = \sqrt{\left(\frac{f}{8g}\right)}$$

Question Number : 169 Question Id : 41809918371 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

What is the normal depth in a wide rectangular channel carrying 0.5 m²/s discharge at a bed

slope of 0.0004 and Manning's n = 0.01?

Options :

1. ✗   0.13 m

2. ✗   0.32 m

3. ✓ 0.43 m

4. ✗   0.50 m

Question Number : 170 Question Id : 41809918372 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Poise has the unit of

Options :

1. ✗   Dyne-cm/s²

2. ✗   Dyne-cm/s

3. ✗   Dyne-s/cm

4. ✓   Dyne-s/cm²

Question Number : 171 Question Id : 41809918373 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Best side slope for most economical trapezoidal section in open channel flow, wherein side

slopes are defined by: X horizontal to 1 vertical, is when X equals

Options :

1. ✖ 0.404

2. ✖ 0.500

3. ✔ 0.577

4. ✖ 0.673

Question Number : 172 Question Id : 41809918374 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The unit of kinematic viscosity is

Options :

1. ✖ $Cm\text{-}sec^2$

2. ✖ Sec/cm^2

Cm-sec

3. ✖

Cm²/sec.

4. ✔

Question Number : 173 Question Id : 41809918375 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Equation of continuity is based on the principle of conservation of

Options :

Mass

1. ✔

Energy

2. ✖

Momentum

3. ✖

Velocity

4. ✖

Question Number : 174 Question Id : 41809918376 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Notch is a device used for measuring

Options :

Rate of flow through pipes

1. ✖

Rate of flow through a small channel

2. ✔

Velocity through a tank

3. ✖

Velocity through an open long channel

4. ✖

Question Number : 175 Question Id : 41809918377 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The range for co-efficient of discharge (Cd) for a venturi meter is

Options :

0.5 to 0.6

1. ✖

0.6 to 0.7

2. ✖

0.7 to 0.8

3. ✖

0.95 to 0.99.

4. ✔

Question Number : 176 Question Id : 41809918378 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Given that the base period is 100 days and the duty of the canal is 1000 hectares per cumecs,

the depth of water will be

Options :

1. ✖ 0.864 cm

2. ✖ 8.64 cm

3. ✔ 86.4 cm

4. ✖ 864 cm

Question Number : 177 Question Id : 41809918379 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For medium silt whose average grain size is 0.16 mm, Lacey's silt factor is likely to be

Options :

1. ✖ 0.30

2. ✖ 0.45

3. ✔   0.70

4. ✖   1.32

Question Number : 178 Question Id : 41809918380 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the depth is 8.64 cm on a field over a base period of 10 days, then the duty is

Options :

1. ✖   10 hectares per cum/s

2. ✖   100 hectares per cum/s

3. ✖   864 hectares per cum/s

4. ✔   1000 hectares per cum/s

Question Number : 179 Question Id : 41809918381 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A canal fall is a control structure

Options :

1. ✗ located at a place where the country slope is flatter than the canal bed slope

2. ✓ located where design bed slope and natural ground slope is mismatched

3. ✗ the location of which is independent of the command to be served

4. ✗ designed to secure raising of water surface on its upstream

Question Number : 180 Question Id : 41809918382 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In Lacey's regime theory, the velocity of flow is proportional to

Options :

1. ✗ Qf^2

2. ✗ Q/f^2

3. ✓ $(Qf^2)^{1/6}$

4. ✗ $(Q/f^2)^{1/6}$

Question Number : 181 Question Id : 41809918383 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What type of cross drainage work is provided when the canal runs below the drain, with FSL

of canal well below the bed of the drain?

Options :

1. ✖   Aqueduct

2. ✔   Super passage

3. ✖   Level crossing

4. ✖   Siphon aqueduct

Question Number : 182 Question Id : 41809918384 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The elementary profile of a dam is

Options :

1. ✖   A rectangle

2. ✖   A trapezoidal

3. ✖

A parallel gram

4. ✔ A right angled triangle.

Question Number : 183 Question Id : 41809918385 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The contraction joints in a gravity dam are provided

Options :

1. ✖ To ensure proper transfer of stresses

2. ✖ To eliminate stress concentrations

3. ✔ To prevent cracks in the dam that may develop due to temperature changes

4. ✖ to eliminate strain concentration

Question Number : 184 Question Id : 41809918386 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The crest level of a barrage is generally kept

Options :

1. ✔ Almost at the river bed level

2. ✘ Above the river bed level

3. ✘ Below the river bed level

4. ✘ Not connected to bed level

Question Number : 185 Question Id : 41809918387 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the height of earthen dam, the top width should not be less than

Options :

1. ✘ 1 m

2. ✔ 3 m

3. ✘ 5 m

4. ✘ 7 m

Question Number : 186 Question Id : 41809918388 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 30 m metric chain is found to be 0.1 m too short throughout the measurement. If the

distance measured is recorded as 300 m, then the actual distance measured will be

Options :

1. ✖ 300.1 m

2. ✖ 301.0m

3. ✔ 299.0 m

4. ✖ 310.0m

Question Number : 187 Question Id : 41809918389 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In chain surveying, Offsets are

Options :

1. ✔ lateral measurements made with respect to main survey lines

2. ✖ only perpendiculars erected from chain lines

3. ✖

taken to avoid unnecessary walking between stations

4. ✖ measurements which are not made at right angles to the chain line

Question Number : 188 Question Id : 41809918390 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If fore bearing of a line is S49°52'E (assuming there is no local attraction), the back bearing

of the line will be

Options :

1. ✖ S 52° 49' E

2. ✖ S 49° 52' E

3. ✖ N 49° 08′ E

4. ✔ N 49° 52' W

Question Number : 189 Question Id : 41809918391 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a closed traverse, the sum of south latitudes exceeds the sum of north latitudes and the sum

of east departures exceeds the sum of west departures. The closing line will lie in the

Options :

1. ✖ N-W quadrant

2. ✖ N-E quadrant

3. ✔ S-E quadrant

4. ✖ S-W quadrant

Question Number : 190 Question Id : 41809918392 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The true length of a line is known to be 200m. When this is measured with a 20 m tape, the length is 200.80 m. The correct length of the 20 m tape is

Options :

1. ✔ 19.92 m

2. ✖ 19.98 m

3. ✖ 20.04 m

4. ✖ 20.08 m

Question Number : 191 Question Id : 41809918393 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A lighthouse is visible just above the horizon at a certain station at the sea level. The distance

between the station and the lighthouse is 40 km. The height of the lighthouse is approximately

Options :

1. ✖   187 m

2. ✖   137.7 m

3. ✔   107.7 m

4. ✖   87.3 m

Question Number : 192 Question Id : 41809918394 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The sensitiveness of a bubble tube in a level would decrease if

Options :

1. ✖   the radius of curvature of the internal surface of the tube is increased

2. ✖   the diameter of the tube is increased

3. ✖   the length of the vapour bubble is increased

4. ✔ the viscosity of the liquid is increased

Question Number : 193 Question Id : 41809918395 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The magnetic needle in a prismatic compass is placed

Options :

1. ✔ at the bottom of the graduated aluminium ring

2. ✖ above the graduated aluminium ring

3. ✖ below the brass box

4. ✖ below the needle lifter, but above the bottom inside the compass

Question Number : 194 Question Id : 41809918396 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the angle of intersection of a contour and a ridge line?

Options :

1. ✖ $30°$

2. ✗   0°

3. ✗   180°

4. ✓   90°

Question Number : 195 Question Id : 41809918397 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The whole circle bearings of lines AB and BC are 30° 15' and 120° 30'. What is the included

angle ABC between the lines AB and BC?

Options :

1. ✗   229° 45'

2. ✓   89° 45'

3. ✗   269° 45'

4. ✗   90° 15'

Question Number : 196 Question Id : 41809918398 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The overfall of a spillway in the shape of a double or s curve which is convex at the top and concave at the bottom, is called as

Options :

1. ✖   Zig zag

2. ✖   Oval spillway

3. ✔   Ogee

4. ✖   S- spillway

Question Number : 197 Question Id : 41809918399 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In theodolite surveying, a plumb line is

Options :

1. ✖   A vertical line

2. ✖   A line parallel to a vertical line

3. ✔   A line perpendicular to level line

4. ✖   A line perpendicular to the horizontal line.

Question Number : 198 Question Id : 41809918400 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A Bench mark, in levelling (surveying), is a

Options :

1. ✖   Reference point

2. ✖   The very first station

3. ✖   The last station where the survey closes

4. ✔   Point of known elevation.

Question Number : 199 Question Id : 41809918401 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A leveling station is a place where:

Options :

1. ✖   The level is set up

2.

✔ The level staff is held

3. ✖   Both B.S. and F.S. are taken

4. ✖   Temporary adjustments are done.

Question Number : 200 Question Id : 41809918402 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Contour lines look to cross each other in case of

Options :

1. ✔   An overhanging cliff

2. ✖   A dam of vertical face

3. ✖   A steep hill

4. ✖   A deep Valley