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 22nd July 2022 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 :	72254492
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

Question Number : 1 Question Id : 7225444602 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\begin{vmatrix} 2 & x & 3 \\ 4 & 1 & 6 \\ -1 & 2 & 7 \end{vmatrix}=0$ then the value of x is

Options :

1. ✖ 6

2. ✖ 5/3

3. ✔ 1/2

4. ✖ -6

Question Number : 2 Question Id : 7225444603 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $2A + 3B - 4I = \begin{pmatrix} 3 & 15 \\ 20 & 28 \end{pmatrix}$ and $A + B + I = \begin{pmatrix} 4 & 6 \\ 8 & 14 \end{pmatrix}$ then $A =$

Options :

1. ✗ $\begin{pmatrix} 3 & 5 \\ 0 & 8 \end{pmatrix}$

2. ✗ $\begin{pmatrix} 3 & 15 \\ 2 & 8 \end{pmatrix}$

3. ✗ $\begin{pmatrix} 13 & 1 \\ 20 & 2 \end{pmatrix}$

4. ✓ $\begin{pmatrix} 2 & 3 \\ 4 & 7 \end{pmatrix}$

Question Number : 3 Question Id : 7225444604 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The system of the simultaneous linear equations

$$x - y - 2z = 3; \quad 2x + y + z = 5; \quad 4x - y - 2z = 1 \text{ then } z =$$

Options :

1. ✓ -10

2. ✖ 3

3. ✖ 0

4. ✖ -1

Question Number : 4 Question Id : 7225444605 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $A = \begin{pmatrix} 1 & 2 \\ 2 & 4 \end{pmatrix}$ and $B = \begin{pmatrix} -4 & 6 \\ 2 & -3 \end{pmatrix}$ then $AB =$

Options :

1. ✖ 1

2. ✖ -8

3. ✖ -4

4. ✔ 0

Question Number : 5 Question Id : 7225444606 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If A is a square matrix such that $A^T = A$ then A is called _____

Options :

1. ✓ symmetric matrix

2. ✗ skew symmetric matrix

3. ✗ singular matrix

4. ✗ scalar matrix

Question Number : 6 Question Id : 7225444607 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{10-x}{x^2+x-12} = \frac{A}{x+4} + \frac{B}{x-3}$ then $A + B =$

Options :

1. ✓ -1

2. ✗ 1

3. ✗ -2

4. ✗ 5

Question Number : 7 Question Id : 7225444608 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $\frac{4x^2+5x+8}{(x^2+5)(x+2)}=\frac{Ax+B}{x^2+5}+\frac{C}{x+2}$ then $B+C\ =$

Options :

1. ✖ 12/7

2. ✖ -15/9

3. ✔ 15/9

4. ✖ 17/9

Question Number : 8 Question Id : 7225444609 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $sin\theta=\frac{3}{5}$, θ *is acute,* then $2tan\theta+3sec\theta+4sec\theta\ cosec\theta=$

Options :

1. ✖ -1

2. ✔ $\frac{163}{12}$

3. ✖ $\frac{-163}{12}$

4. ✖ $\frac{13}{12}$

Question Number : 9 Question Id : 7225444610 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x = asec\theta\ , y = btan\theta$ then $\frac{x^2}{a^2} - \frac{y^2}{b^2} =$

Options :

1. ✗ $\frac{1}{2}$

2. ✗ $-\frac{1}{2}$

3. ✗ $\frac{1}{4}$

4. ✓ 1

Question Number : 10 Question Id : 7225444611 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 $tan^2 60^0 + 2tan^2 45^0$ is

Options :

1. ✓ 5

2. ✗ 2

3. ✖ -5

4. ✖ -3

Question Number : 11 Question Id : 7225444612 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 $tan20^0\ tan40^0\ tan60^0\ tan80^0$ is

Options :

1. ✖ -2

2. ✖ 2

3. ✖ -3

4. ✔ 3

Question Number : 12 Question Id : 7225444613 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $(1+tanA)(1+tanB)=2$ then $A+B=$

Options :

1. ✖ 65^0

2. ✔ 45^0

3. ✗ 35^0

4. ✗ 25^0

Question Number : 13 Question Id : 7225444614 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 $sin20^0\ sin40^0\ sin60^0\ sin80^0$ is

Options :

1. ✗ $\frac{-3}{16}$

2. ✗ $\frac{23}{16}$

3. ✗ $\frac{31}{16}$

4. ✓ $\frac{3}{16}$

Question Number : 14 Question Id : 7225444615 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If in a triangle ABC , $a = 13, b = 14, c = 15$ then the area of the triangle is

Options :

1. ✗ 35 sq. units

2. ✗ 56 sq. units

3. ✓ 84 sq. units

4. ✗ 94 sq. units

Question Number : 15 Question Id : 7225444616 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 $sin^{-1}\frac{5}{13} + \tan^{-1}\frac{12}{5}$ is

Options :

1. ✗ $-\frac{\pi}{2}$

2. ✗ $\frac{\pi}{4}$

3. ✓ $\frac{\pi}{2}$

4. ✗ $-\frac{\pi}{3}$

Question Number : 16 Question Id : 7225444617 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response

Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of trigonometric equation $sec4\theta - sec2\theta = 2$ is

Options :

1. ✓ $\frac{2n\pi}{5} \pm \frac{\pi}{10}$ or $2n\pi \pm \frac{\pi}{2}$

2. ✗ $\frac{3\pi}{5}$

3. ✗ $\frac{5\pi}{4}$

4. ✗ $\frac{\pi}{4}$

Question Number : 17 Question Id : 7225444618 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 $\tan^{-1}(2sin150^0)$is

Options :

1. ✗ π

2. ✗ 3π

3. ✖ $\frac{\pi}{2}$

4. ✔ $\frac{\pi}{4}$

Question Number : 18 Question Id : 7225444619 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The modulus of $\frac{(1+i)(i-\sqrt{3})i}{1-i}$ is

Options :

1. ✔ 2

2. ✖ 6

3. ✖ -2

4. ✖ 4

Question Number : 19 Question Id : 7225444620 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $1, \omega, \omega^2$ are the cube roots of unity, then $(1-\omega)(1-\omega^2)(1-\omega^4)(1-\omega^5) =$

Options :

1. ✖ 3

2. ✔ 9

3. ✖ 1

4. ✖ 0

Question Number : 20 Question Id : 7225444621 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 tangent from(-3,1) to the circle $3x^2 + 3y^2 - 5x - 6y - 12 = 0$ is

Options :

1. ✖ -3

2. ✔ 3

3. ✖ 4

4. ✖ 9

Question Number : 21 Question Id : 7225444622 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 an equilateral hyperbola is

Options :

1. ✖ 1

2. ✔ $\sqrt{2}$

3. ✖ 3

4. ✖ $\sqrt{3}$

Question Number : 22 Question Id : 7225444623 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 hyperbola $36x^2 - 25y^2 = 900$ is

Options :

1. ✔ $\frac{\sqrt{61}}{5}$

2. ✖ $\frac{9}{2}$

3. ✖ $\frac{3}{2}$

4. ✖ $\frac{5}{2}$

Question Number : 23 Question Id : 7225444624 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 tangent to parabola $y^2 = 16x$ at an end point of latus rectum is

Options :

1. ✗ $2x - 3y - 4 = 0$

2. ✗ $2x + 2y + 4 = 0$

3. ✓ $x - y + 4 = 0$

4. ✗ $x - y - 4 = 0$

Question Number : 24 Question Id : 7225444625 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $y = 4x + k$ is a tangent to the hyperbola $\frac{x^2}{64} - \frac{y^2}{49} = 1$ then the value of k is

Options :

1. ✗ $\pm\sqrt{775}$

2. ✗ $\pm\sqrt{995}$

3. ✗ $\pm\sqrt{275}$

4. ✓ $\pm\sqrt{975}$

Question Number : 25 Question Id : 7225444626 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the line $2x + \sqrt{6}\,y = 2$ touches the hyperbola $x^2 - 2y^2 = 4$ then the point of contact is

Options :

1. ✗ $(4, \sqrt{6})$

2. ✓ $(4, -\sqrt{6})$

3. ✗ $(-4,6)$

4. ✗ $(5,7)$

Question Number : 26 Question Id : 7225444627 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 $\lim\limits_{x\to 2}\left(\frac{x^3-3x-2}{2x^2-5x+2}\right)$ is

Options :

1. ✗ $\frac{1}{3}$

2. ✓ 3

3. ✖ $\frac{1}{5}$

4. ✖ $\frac{1}{2}$

Question Number : 27 Question Id : 7225444628 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $2x^2 - 3xy + 4y^2 = 1$ then $\frac{dy}{dx} =$

Options :

1. ✔ $\frac{4x-3y}{3x-8y}$

2. ✖ $\frac{4x-7y}{3x-8y}$

3. ✖ $\frac{4x-3y}{3x+8y}$

4. ✖ $\frac{4x-3y}{3x-18y}$

Question Number : 28 Question Id : 7225444629 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $x = a\sin^2 t$ and $y = a\cos^2 t$ then $\frac{dy}{dx} =$

Options :

1. ✖ -2

2. ✖ $\tan t$

3. ✖ $\sin t$

4. ✔ -1

Question Number : 29 Question Id : 7225444630 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The curve $xy^2 = 16$ at the point where the ordinate is -2 then the equation of tangent is

Options :

1. ✖ $x + 4y - 12 = 0$

2. ✖ $2x - 4y - 12 = 0$

3. ✔ $x - 4y - 12 = 0$

4. ✖ $x - 5y - 12 = 0$

Question Number : 30 Question Id : 7225444631 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 normal to the curve $y^2 = \frac{x^3}{2a-x}$ at the point (a, a) is

Options :

1. ✓ $x + 2y = 3a$

2. ✗ $x - 2y = 4a$

3. ✗ $2x + y = 2a$

4. ✗ $3x - 4y = 5a$

Question Number : 31 Question Id : 7225444632 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The angle between the curves $xy = 2$ and $y^2 = 4x$ is

Options :

1. ✗ $-\tan^{-1}(3)$

2. ✓ $\tan^{-1}(3)$

3. ✗ $\sin^{-1}(3)$

4. ✗ $\cos^{-1}(3)$

Question Number : 32 Question Id : 7225444633 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum value of xe^{-x} is

Options :

1. ✓ $\frac{1}{e}$

2. ✗ $-\frac{1}{e}$

3. ✗ $2e$

4. ✗ e

Question Number : 33 Question Id : 7225444634 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The height of the right circular cylinder of greatest volume which is inscribed in a sphere of radius a is

Options :

1. ✗ $\frac{-2a}{7}$

2. ✗ $-\frac{a}{2}$

3. ✔ $\frac{2a}{\sqrt{3}}$

4. ✖ $\frac{1}{2}$

Question Number : 34 Question Id : 7225444635 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 a spherical ball is increasing at the rate of 4π cc/s, then the rate of increase of the radius, when the volume is $288\pi\ cc$ is

Options :

1. ✖ 36 cm/sec

2. ✖ 6 cm/sec

3. ✔ $\frac{1}{36} cm/sec$

4. ✖ $\frac{1}{6} cm/sec$

Question Number : 35 Question Id : 7225444636 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $z = e^{(ax+by)} f(ax-by)$ then $b\frac{\partial z}{\partial x} + a\frac{\partial z}{\partial y} =$

Options :

1. ✖ $-2abz$

2. ✖ $3abz$

3. ✔ 2abz

4. ✖ 5abz

Question Number : 36 Question Id : 7225444637 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 $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$ is

Options :

1. ✖ $\log(e^{2x} - 1) - x + c$

2. ✖ $-\log(e^{2x} + 1) - x + c$

3. ✖ $\log(e^{2x} + 7) - x + c$

4. ✔ $log(e^{2x}+1)-x+c$

Question Number : 37 Question Id : 7225444638 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 $\int \frac{dx}{\sqrt{4x^2-4x+2}}$ is

Options :

1. ✖ $-\frac{1}{2}\sinh^{-1}(x-1)+c$

2. ✖ $\frac{1}{2}\sinh^{-1}(2x+1)+c$

3. ✔ $\frac{1}{2}\sinh^{-1}(2x-1)+c$

4. ✖ $\frac{1}{2}\sinh^{-1}(3x-1)+c$

Question Number : 38 Question Id : 7225444639 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 $\int logx\,dx$ is

Options :

1. ✖ $logx-x+c$

2. ✔ $xlogx - x + c$

3. ✖ $2xlogx + x + c$

4. ✖ $-xlogx + x + c$

Question Number : 39 Question Id : 7225444640 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 $\int_0^{\pi/4} \sqrt{1 + sin2x}\, dx$ is

Options :

1. ✔ 1

2. ✖ 2

3. ✖ -1

4. ✖ π

Question Number : 40 Question Id : 7225444641 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The area enclosed between the curves $y^2 = 4x$ and $x^2 = 4y$ is

Options :

1. ✓ $\frac{16}{3}$ square units

2. ✗ $\frac{5}{2}$ square units

3. ✗ $\frac{3}{2}$ square units

4. ✗ $\frac{9}{2}$ square units

Question Number : 41 Question Id : 7225444642 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The mean value of $\frac{1}{4+x^2}$ on $[-2,2]$ is

Options :

1. ✗ $\frac{\pi}{12}$

2. ✗ $-\frac{\pi}{2}$

3. ✗ $\frac{\pi}{2}$

4. ✓ $\frac{\pi}{4}$

Question Number : 42 Question Id : 7225444643 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 $\int \frac{1}{1+4x^2}\,dx$ on R is

Options :

1. ✗ $-\frac{1}{2}tan^{-1}(2x)+c$

2. ✗ $\frac{1}{2}tan^{-1}(5x)+c$

3. ✗ $-\frac{1}{2}tan^{-1}(x)+c$

4. ✓ $\frac{1}{2}tan^{-1}(2x)+c$

Question Number : 43 Question Id : 7225444644 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 $\int_0^1 \frac{x\sin^{-1}x}{\sqrt{1-x^2}}\,dx$ is

Options :

1. ✖ -1

2. ✖ 0

3. ✔ 1

4. ✖ 5

Question Number : 44 Question Id : 7225444645 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The order and degree of the differential equation $\left(\frac{dy}{dx}\right)^2 + 3\left(\frac{dy}{dx}\right) + 2 = 0$ is

Options :

1. ✖ Order=2, degree=2

2. ✖ Order=2, degree=1

3. ✔ order = 1, degree = 2

4. ✖ Order=3, degree=1

Question Number : 45 Question Id : 7225444646 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of the differential equation $\frac{dy}{dx} + ycotx = 4xcosecx$ is

Options :

1. ✖ $ycosx = 2x^2+c$

2. ✔ $ysinx = 2x^2+c$

3. ✖ $ysinx = -2x^2+c$

4. ✖ $ysinx = 3x^2+c$

Question Number : 46 Question Id : 7225444647 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of the linear differential equation $\frac{dy}{dx} - \frac{y}{x+1} = e^{3x}(x+1)$ is

Options :

1. ✖ $y/\sin x = -\frac{e^{4x}}{4} + c$

2. ✔ $\frac{y}{x+1} = \frac{e^{3x}}{3} + c$

3. ✖ $y\,e^{3x}\,x = -\frac{\cos 2x}{4} + ce^{3x}$

4. ✖ $y \sin x = \frac{e^{3x}}{4} + c$

Question Number : 47 Question Id : 7225444648 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The particular integral of the differential equation $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^x$ is

Options :

1. ✖ $-\frac{e^x}{6}$

2. ✖ $\frac{e^x}{16}$

3. ✖ $\frac{e^x}{9}$

4. ✔ $\frac{e^x}{6}$

Question Number : 48 Question Id : 7225444649 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The particular integral for the differential equation $(D^2 + 4D + 3)y = sin3x$ is

Options :

1. ✖ $sinx + 3cos2x$

2. ✖ $cos3x - 2sin4x$

3. ✖ $\frac{2}{30}(2cos2x + sinx)$

4. ✔ $\frac{-1}{30}(2cos3x + sin3x)$

Question Number : 49 Question Id : 7225444650 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✔ $\frac{1}{xy} = -x + c$

2. ✖ $\frac{-1}{xy} = -x + c$

3. ✖ $\frac{2}{xy} = x + c$

4. ✗ $\frac{1}{y} = -x + c$

Question Number : 50 Question Id : 7225444651 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The general solution of the differential equation $(2x + y + 1)dx + (x + 2y + 1)dy = 0$ is

Options :

1. ✗ $x^2 + xy + 3y^2 + 2x + y = c$

2. ✓ $x^2 + xy + y^2 + x + y = c$

3. ✗ $2x^2 + xy + 2y^2 + x + y = c$

4. ✗ $x^2 - xy + 2y^2 + x + y = c$

Physics

Section Id :	72254493
Section Number :	2
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

Question Number : 51 Question Id : 7225444652 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The dimensions of permeability is

Options :

1. ✓ $MLT^{-2}A^{-2}$

2. ✗ $MLT^{-1}A^{-2}$

3. ✗ $MLT^{-2}A^{-1}$

4. ✗ $MLT^{-1}A^{-1}$

Question Number : 52 Question Id : 7225444653 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If velocity (V), force (F) and energy (E) are taken as fundamental units, then dimensional formula for mass will be

Options :

1. ✗ V^0FE^2

2. ✗ $VF^{-2}E^0$

3. ✗ $V^{-2}F^0E$

4. ✓ $V^{-2}F^{0}E$

Question Number : 53 Question Id : 7225444654 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vector A extends from the origin to a point having polar coordinates $(7, 70^0)$ and vector B extends from the origin to a point having polar coordinates $(4, 130^0)$. Find $A \bullet B$

Options :

1. ✗ 28

2. ✓ 14

3. ✗ 0

4. ✗ 7

Question Number : 54 Question Id : 7225444655 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If two vectors $2\hat{\imath} + 3\hat{\jmath} - \hat{k}$ and $-4\hat{\imath} - 6\hat{\jmath} - \lambda\hat{k}$ are parallel to each other then value of λ be

Options :

1. ✗ 2

2. ✓ 4

3. ✖ 0

4. ✖ 6

Question Number : 55 Question Id : 7225444656 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 static friction between contact surfaces of two bodies is 1. The contact surface of one body supports the other till the inclination is less than

Options :

1. ✖ 30^0

2. ✔ 45^0

3. ✖ 60^0

4. ✖ 90^0

Question Number : 56 Question Id : 7225444657 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A smooth block is released from rest on a 45^0 inclined plane and it slides a distance 'd'. The time taken to slide is 'n' times that on a smooth inclined plane. The coefficient of friction is

Options :

1. ✓ $\mu_k = 1 - \frac{1}{n^2}$

2. ✗ $\mu_k = \sqrt{1 - \frac{1}{n^2}}$

3. ✗ $\mu_k = \frac{1}{1-n^2}$

4. ✗ $\mu_k = \sqrt{\frac{1}{1-n^2}}$

Question Number : 57 Question Id : 7225444658 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 projected at an angle other than 90^0 with the horizontal with some velocity. If the time of ascent of the body is 1second, then the maximum height it can reach is (Take $g=10ms^{-2}$)

Options :

1. ✓ 5 m

2. ✗ 10 m

3. ✗ 2.5 m

4. ✖ $75\ m$

Question Number : 58 Question Id : 7225444659 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A bullet fired from a gun falls at a distance half of its maximum range. The angle of projection of the bullet is

Options :

1. ✖ 45^0

2. ✖ 60^0

3. ✖ 30^0

4. ✔ 15^0

Question Number : 59 Question Id : 7225444660 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 thrown vertically upwards with a velocity. Select the incorrect statements from the following

I. Both velocity and acceleration are zero at its highest point.

II. Velocity is maximum and acceleration is zero at the highest point

III. Velocity is maximum and acceleration is 'g' downwards at its highest point

Options :

1. ✓ I,II and III

2. ✗ II and III

3. ✗ I and II

4. ✗ I and III

Question Number : 60 Question Id : 7225444661 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A person standing on a tower of height 60 m throws an object upwards with velocity of 40 m/s at an angle 30^0 to the horizontal. Find the total time taken by the object to gain maximum height and fall on the ground (take g= 10 m/s^2).

Options :

1. ✗ 3 s

2. ✗ 20 s

3. ✓ 6 s

4. ✗ 16 s

Question Number : 61 Question Id : 7225444662 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A bucket full of water is drawn up by a person. In this case the work done by the gravitational force is

Options :

1. ✓ Negative because the force and displacement are in opposite directions

2. ✗ Positive because the force and displacement are in the same direction

3. ✗ Negative because the force and displacement are the same direction

4. ✗ Positive because the force and displacement are in opposite direction

Question Number : 62 Question Id : 7225444663 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a long spring is stretched by x cm, its potential energy is U. If the spring is stretched by Nx cm, the potential energy stored in it will be

Options :

1. ✗ U/N

2. ✗ NU

3. ✓ N^2U

4. ✗ U/N^2

Question Number : 63 Question Id : 7225444664 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 a non-renewable source of energy?

Options :

1. ✔ Coal

2. ✘ Solar

3. ✘ Geothermal

4. ✘ Tidal

Question Number : 64 Question Id : 7225444665 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a class room has dimensions 20x15x5 m^3 and reverberation time 1.5 sec, the total absorption of all surfaces and the average absorption coefficient will be

Options :

1. ✘ 0.7 and 69

2. ✔ 69 and 0.07

3. ✘ 6.9 and 0.7

4. ✖ 0.69 and 0.7

Question Number : 65 Question Id : 7225444666 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A source of sound of frequency 450 cycles/sec is stationary but an observer is moving towards the source with 34 m/sec speed. If the speed of sound is 340 m/sec, the apparent frequency will be

Options :

1. ✖ 410 cycles/sec

2. ✖ 500 cycles/sec

3. ✖ 550 cycles/sec

4. ✔ 495 cycles/sec

Question Number : 66 Question Id : 7225444667 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simple pendulum has a time period T in vacuum. Its time period when it is completely immersed in a liquid of density one-eighth of the density of material of the bob is

Options :

1. ✖ $\sqrt{\frac{7}{8}}T$

2. ✗ $\sqrt{\frac{5}{8}}T$

3. ✗ $\sqrt{\frac{3}{8}}T$

4. ✓ $\sqrt{\frac{8}{7}}T$

Question Number : 67 Question Id : 7225444668 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 simple harmonic motion represented by displacement function as $x(t) = A \sin(\omega t + \phi)$. If the position and velocity of the particle at $t = 0$ s are 2 cm and 2ω cm s^{-1} respectively, then its amplitude is $x\sqrt{2}$ cm where the value of x is

Options :

1. ✓ 2

2. ✗ $2\sqrt{2}$

3. ✗ 4

4. ✗ 1

Question Number : 68 Question Id : 7225444669 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An observer standing between two parallel cliffs emits an intense sound note. If two successive echoes are heard after 5 s and 7 s, then distance between the cliffs is (velocity of sound is 340 m/s)

Options :

1. ✗ 850 m

2. ✗ 1190 m

3. ✓ 2040 m

4. ✗ 340 m

Question Number : 69 Question Id : 7225444670 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

M grams of steam at 100°C is mixed with 200 g of ice at its melting point in a thermally insulated container. If it produced liquid water at 40°C [heat of vaporization of water is 540 cal/g and heat of fusion of ice is 80 cal/g] the value of M is

Options :

1. ✗ 20

2. ✗ 80

3. ✓ 40

4. ✗ 10

Question Number : 70 Question Id : 7225444671 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which type of ideal gas will have the largest value for $C_p - C_v$?

Options :

1. ✗ Polyatomic

2. ✗ Diatomic

3. ✗ Monoatomic

4. ✓ The value will be the same for all

Question Number : 71 Question Id : 7225444672 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In thermodynamics, heat and work are

Options :

1. ✓ Path functions

2. ✗ Intensive thermodynamic state variables

3. ✖ Extensive thermodynamic state variables

4. ✖ Point functions

Question Number : 72 Question Id : 7225444673 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For an adiabatic expansion of an ideal gas, the fractional change in its pressure is equal to (where γ is the ratio of specific heats):

Options :

1. ✖ $-\gamma\frac{V}{dV}$

2. ✔ $-\gamma\frac{dV}{V}$

3. ✖ $-\frac{1}{\gamma}\frac{V}{dV}$

4. ✖ $-\frac{1}{\gamma}\frac{dV}{V}$

Question Number : 73 Question Id : 7225444674 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 processes must violate the first law of thermodynamics?

Options :

1. ✓ $W > 0, Q > 0,$ and $\Delta E_{int} < 0$

2. ✗ $W > 0, Q < 0,$ and $\Delta E_{int} > 0$

3. ✗ $W < 0, Q > 0,$ and $\Delta E_{int} < 0$

4. ✗ $W > 0, Q < 0,$ and $\Delta E_{int} = 0$

Question Number : 74 Question Id : 7225444675 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The critical angle for total internal reflection is maximum for

Options :

1. ✗ Red light

2. ✗ Blue light

3. ✗ Ultraviolet rays

4. ✓ Infrared rays

Question Number : 75 Question Id : 7225444676 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Photon of frequency (f) has a momentum (p) associated with it. If c is the velocity of light, the momentum is

Options :

1. ✓ hf/c

2. ✗ f/c

3. ✗ hfc

4. ✗ hf/c^2

Chemistry

Section Id :	72254494
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

Question Number : 76 Question Id : 7225444677 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bohr's theory can be applied to which of the following ions?

Options :

1. ✗ Na^+

2. ✖ Be^{2+}

3. ✖ Li^{+}

4. ✔ Li^{2+}

Question Number : 77 Question Id : 7225444678 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 correct orbital designation of an electron with the quantum number , n=4, l=3, m=2, s=1/2?

Options :

1. ✖ 3d

2. ✔ 4f

3. ✖ 5p

4. ✖ 6s

Question Number : 78 Question Id : 7225444679 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Two electrons present in an orbital are distinguished by

Options :

1. ✗ Principal Quantum number

2. ✗ Azimuthal Quantum number

3. ✗ Magnetic Quantum number

4. ✓ Spin Quantum number

Question Number : 79 Question Id : 7225444680 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Favorable conditions for the formation of an ionic bond are

Options :

1. ✗ Small cation, large anion, high charge on both the ions.

2. ✓ Large cation, small anion, low charge on both the ions

3. ✗ Large cation, large anion, high charge on both the ions.

Small cation, small anion, high charge on both the ions

4. ✖

Question Number : 80 Question Id : 7225444681 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum covalent character is observed in

Options :

1. ✖ LiCl

2. ✖ $BeCl_2$

3. ✖ LiF

4. ✔ $BeBr_2$

Question Number : 81 Question Id : 7225444682 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a reaction of H_2SO_4 with NaOH, $NaHSO_4$ is formed. Equivalent weight of H_2SO_4 is

Options :

1. ✖ 49 grams

2. ✔ 98 grams

3. ✗ 98 amu

4. ✗ 49 amu

Question Number : 82 Question Id : 7225444683 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If 5.85 grams of NaCl are dissolved in water and the solution is made up to 0.5 litre, the molarity of solution will be:

Options :

1. ✓ 0.2

2. ✗ 0.4

3. ✗ 1.0

4. ✗ 0.1

Question Number : 83 Question Id : 7225444684 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of Mercury with other metals is called

Options :

1. ✗ Saturated solutions

2. ✗ Unsaturated solutions

3. ✓ Amalgam

4. ✗ Supersaturated solutions.

Question Number : 84 Question Id : 7225444685 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A strong acid has a

Options :

1. ✗ Weak conjugate acid

2. ✓ Weak conjugate base

3. ✗ Strong conjugate base

4. ✗ Strong conjugate acid

Question Number : 85 Question Id : 7225444686 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Electron pair donor is

Options :

1. ✗ Lowry- Bronsted base

2. ✗ Lowry- Bronsted acid

3. ✗ Lewis acid

4. ✓ Lewis base

Question Number : 86 Question Id : 7225444687 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The poor conductor of the electricity among the following is:

Options :

1. ✗ Copper

2. ✗ Aluminium

3. ✗ Silver

4. ✓ Pure water

Question Number : 87 Question Id : 7225444688 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The amount of electricity that can deposit 108 g of silver from $AgNO_3$ solution is

Options :

1. ✗ 1 ampere

2. ✗ 1 coulomb

3. ✓ 1 faraday

4. ✗ 1 siemen

Question Number : 88 Question Id : 7225444689 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 false regarding galvanic cells?

Options :

1. ✗ It converts chemical energy into electrical energy

2. ✗ The electrolytes taken in the two beakers are different

3. ✓ The reactions taking place are non-spontaneous

4. ✗ To set up this cell, a salt bridge is required

Question Number : 89 Question Id : 7225444690 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 standard reduction potential of cathode of a galvanic cell if the standard EMF of the cell and standard reduction potential of the anode are 2.71 volts and -2.37 volts respectively?

Options :

1. ✗ 0.68 volts

2. ✗ -0.68 volts

3. ✗ -0.34 volts

4. ✓ 0.34 volts.

Question Number : 90 Question Id : 7225444691 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hardness of water is conventionally expressed in terms of equivalent amount of

Options :

1. ✗ $MgCO_3$

2. ✓ $CaCO_3$

3. ✗ Na_2CO_3

4. ✗ K_2CO_3

Question Number : 91 Question Id : 7225444692 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Zero hardness of water is achieved by

Options :

1. ✗ Using Lime soda process

2. ✗ Excess lime treatment

3. ✗ Using excess alum dosage

4. ✓ Ion-Exchange method

Question Number : 92 Question Id : 7225444693 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 hardness of water in terms of $CaCO_3$ equivalent if water contains 27.6 mg/L of $MgSO_4$

Options :

1. ✓ 23 mg/L

2. ✗ 2.3 mg/L

3. ✗ 28 mg/L

4. ✗ 12 mg/L

Question Number : 93 Question Id : 7225444694 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Electrochemical corrosion in acidic environment is carried with

Options :

1. ✗ Evolution of oxygen

2. ✗ Absorption of oxygen

3. ✓ Evolution of hydrogen

4. ✖ Absorption of hydrogen

Question Number : 94 Question Id : 7225444695 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 metal oxide film is protective from corrosion?

Options :

1. ✖ Porous

2. ✔ Non- porous

3. ✖ Volatile

4. ✖ Unstable

Question Number : 95 Question Id : 7225444696 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 thermosetting plastic?

Options :

1. ✖ PVC

2. ✖ Teflon

3. ✗ Polystyrene

4. ✓ Bakelite

Question Number : 96 Question Id : 7225444697 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ebonite is

Options :

1. ✓ highly vulcanized rubber

2. ✗ PVC

3. ✗ Synthetic rubber

4. ✗ polystyrene

Question Number : 97 Question Id : 7225444698 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Buna-S rubber is made up of the monomers of

Options :

1. ✗ 1,3 butadiene and acrylonitrile

2. ✓ 1,3 butadiene and styrene

3. ✗ 1,3 butadiene and formaldehyde

4. ✗ 1,3 butadiene and phenol

Question Number : 98 Question Id : 7225444699 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Composition of water gas is

Options :

1. ✗ $CO + N_2$

2. ✗ $CO + CH_4$

3. ✓ $CO + H_2$

4. ✗ $CH_4 + N_2$

Question Number : 99 Question Id : 7225444700 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 not a green house gas

Options :

1. ✓ Hydrogen

2. ✗ Carbon monoxide

3. ✗ Methane

4. ✗ Nitrous oxide

Question Number : 100 Question Id : 7225444701 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Photochemical smog is due to the presence of

Options :

1. ✗ Oxide of carbon

2. ✗ Lead

3. ✗ Oxide of sulphur

4. ✓ Oxide of nitrogen

Civil Engineering

Section Id :	72254495
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

Question Number : 101 Question Id : 7225444702 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Modulus of elasticity is defined as the ratio of

Options :

1. ✗ Shear stress to shear strain

2. ✓ Linear stress to linear strain

3. ✗ Linear strain to lateral strain

4. ✗ Lateral strain to linear strain

Question Number : 102 Question Id : 7225444703 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a simply supported beam carrying a uniformly distributed load of w per unit run over the whole span the maximum B.M is equal to

Options :

1. ✗ $\frac{wl^2}{4}$

2. ✗ $\frac{wl^3}{6}$

3. ✓ $\frac{wl^2}{8}$

4. ✗ $\frac{wl^3}{8}$

Question Number : 103 Question Id : 7225444704 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The point of contraflexure is also called

Options :

1. ✗ The point of inflexion

2. ✗ Point of zero shear force

3. ✓ Point of zero torsion

4. ✗ Structural hinge

Question Number : 104 Question Id : 7225444705 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The strength of the beam mainly depends on

Options :

1. ✗ Bending moment

2. ✗ c.g. of the section

3. ✓ section modulus

4. ✗ its weight

Question Number : 105 Question Id : 7225444706 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Circular beams of uniform strength can be made by varying diameter in such a way that

Options :

1. ✔ $\frac{M}{Z}$ is constant

2. ✖ $\frac{\sigma}{y}$ is constant

3. ✖ $\frac{E}{R}$ is constant

4. ✖ $\frac{M}{R}$ is constant

Question Number : 106 Question Id : 7225444707 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shafts are designed on the basis of

Options :

1. ✔ Strength and rigidity

2. ✖ C.G of cross section

3. ✖ Area of cross section

4. ✖ Product of Inertia of cross section

Question Number : 107 Question Id : 7225444708 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Proof resilience is the mechanical property of materials which indicates their capacity to bear

Options :

1. ✗ Static tensile loads

2. ✗ Static compressive loads

3. ✓ Shocks

4. ✗ Shear force

Question Number : 108 Question Id : 7225444709 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The radius of gyration of a circular column of diameter d is

Options :

1. ✓ $d/4$

2. ✗ $d/2$

3. ✗ $d^2/4$

4. ✗ $d^2/16$

Question Number : 109 Question Id : 7225444710 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 bulk modulus to modulus of elasticity for a Poisson's ratio of 0.25 would be

Options :

1. ✓ 2/3

2. ✗ 1/3

3. ✗ 4/3

4. ✗ 1.0

Question Number : 110 Question Id : 7225444711 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The property by virtue of which a metal can be beaten into plates is called

Options :

1. ✗ Ductility

2. ✓ Malleability

3. ✗ Resilience

4. ✗ Plasticity

Question Number : 111 Question Id : 7225444712 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 carries a uniformly distributed load of w kgf per unit length over the whole span (l). the shear force at the centre is

Options :

1. ✗ $\frac{wl}{2}$

2. ✗ $\frac{wl^2}{8}$

3. ✗ $\frac{wl}{4}$

4. ✓ Zero.

Question Number : 112 Question Id : 7225444713 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cantilever of length (l) carries a uniformly distributed load w kgf per unit length for the whole length. The shear force at the free end will be

Options :

1. ✖ wl

2. ✖ $\frac{wl^2}{2}$

3. ✖ $\frac{wl}{2}$

4. ✔ Zero.

Question Number : 113 Question Id : 7225444714 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 equations is correct

Options :

1. ✖ $\frac{1}{R} = \frac{d^2y}{dx^2} = \frac{EI}{M}$

2. ✔ $\frac{1}{R} = \frac{d^2y}{dx^2} = \frac{M}{EI}$

3. ✖ $R = \frac{d^2y}{dx^2} = \frac{M}{EI}$

4. ✖ $R = \frac{d^2y}{dx^2} = \frac{EI}{M}$

Question Number : 114 Question Id : 7225444715 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The torsional rigidity of a shaft is defined as the torque required to produce

Options :

1. ✗ Maximum twist in the shaft

2. ✗ Maximum shear stress in the shaft

3. ✗ Minimum twist in the shaft

4. ✓ A twist of one radian per unit length of the shaft

Question Number : 115 Question Id : 7225444716 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Two shafts, one solid and the other hollow, are made of the same materials and are having same length and weight. The hollow shaft as compared to solid shaft is

Options :

1. ✓ More strong

2. ✗ Less strong

3. ✖ Having same strength

4. ✖ Yielding easily

Question Number : 116 Question Id : 7225444717 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The torque transmitted by a solid shaft of diameter 40 mm if the shear stress is not to exceed 400 kg/cm^2, would be

Options :

1. ✔ $1.6 \times \pi$ kg-m

2. ✖ $16 \times \pi$ kg-m

3. ✖ $0.8 \times \pi$ kg-m

4. ✖ $0.4 \times \pi$ kg-m

Question Number : 117 Question Id : 7225444718 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A steel cube of 8000 cc is subjected to all round stress of 1330 kg/cm^2. The bulk modulus of the material is 1.33×10^6 kg/cm^2. The volumetric change is

Options :

1. ✔ 8 cc

2. ✖ 6 cc

3. ✖ 0.8 cc

4. ✖ 10^{-3}

Question Number : 118 Question Id : 7225444719 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A bar of diameter 30 mm is subjected to a tensile load such that the measured extension on a gauge length of 200 mm is 0.09 mm and the change in diameter is 0.0045 mm. The Poisson's ratio will be

Options :

1. ✖ 1/4

2. ✔ 1/3

3. ✖ 1/5

4. ✖ 1/6

Question Number : 119 Question Id : 7225444720 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the crushing stress in a material of a mild steel column is 3300 kg/cm^2.

Euler's formula for crippling load is applicable for slenderness ratio equal to

greater than

Options :

1. ✗ 40

2. ✗ 50

3. ✗ 60

4. ✓ 80

Question Number : 120 Question Id : 7225444721 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A solid shaft of circular cross-section is subjected to a torque which produces

a maximum shear stress f_s in the shaft. The diameter of the shaft should be

Options :

1. ✗ $\sqrt{(\frac{\pi fs}{16T})}$

2. ✗ $\sqrt[3]{(\frac{\pi fs}{16T})}$

3. ✗ $\sqrt{(\frac{16T}{\pi fs})}$

4. ✓ $\sqrt[3]{(\frac{16T}{\pi fs})}$

Question Number : 121 Question Id : 7225444722 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A ratio of moment carrying capacity of a circular beam of diameter D and square beam of size D is

Options :

1. ✗ $\pi/4$

2. ✗ $3\pi/8$

3. ✗ $\pi/3$

4. ✓ $3\pi/16$

Question Number : 122 Question Id : 7225444723 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 *l* is carrying point load *W* at the mid span.

What is the deflection at the centre of the beam?

Options :

1. ✗ $\frac{wl^2}{48EI}$

2. ✓ $\frac{wl^3}{48EI}$

3. ✗ $\frac{5wl^3}{348EI}$

4. ✗ $\frac{11wl^3}{120EI}$

Question Number : 123 Question Id : 7225444724 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Euler's buckling formula is applicable for columns

Options :

1. ✗ Subjected to eccentric loads

2. ✗ Having initial curvature

3. ✓ Initially straight and subjected to only axial loads

4. ✗ Subjected to bending moment

Question Number : 124 Question Id : 7225444725 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Rankine formula takes into account which of the following?

Options :

1. ✓ The effect of slenderness ratio and direct compressive strength

2. ✗ The initial curvature of the column

3. ✗ The effect of direct compressive strength.

4. ✗ The effect of shear strength

Question Number : 125 Question Id : 7225444726 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 of rectangular section. It carries a uniformly distributed load over the whole span. The deflection at the centre is y. if the depth of the beam is doubled, the deflection at the centre would be

Options :

1. ✗ 2y

2. ✗ 4y

3. ✗ $\frac{y}{2}$

4. ✓ $\frac{y}{8}$

Question Number : 126 Question Id : 7225444727 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 crippling load, for a column of length (l) with both ends fixed to the crippling load of the same column with one end fixed and other end is hinged, is equal to

Options :

1. ✓ 2.0

2. ✗ 4.0

3. ✗ 8.0

4. ✗ 16.0

Question Number : 127 Question Id : 7225444728 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The equivalent length is equal to actual length divided by $\sqrt{2}$ for a column Width

Options :

1. ✖ One end fixed and other end free

2. ✖ Both ends fixed

3. ✔ One end is fixed and other end hinged

4. ✖ Both ends hinged

Question Number : 128 Question Id : 7225444729 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Rankine's constant (a) in Rankine's formula is equal to

Options :

1. ✖ $\frac{\pi^2 E}{f_c}$

2. ✖ $\frac{\pi^2}{\mathrm{E}f_c}$

3. ✖ $\frac{Ef_c}{\pi^2}$

4. ✔ $\frac{f_c}{\pi^2 E}$

Question Number : 129 Question Id : 7225444730 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 l fixed at both ends, carries a point load W at its centre. If EI is the flexural rigidity of the beam, the maximum deflection in the beam is

Options :

1. ✖ $Wl^3/48EI$

2. ✔ $Wl^3/192EI$

3. ✖ $Wl^3/96EI$

4. ✖ $Wl^3/24EI$

Question Number : 130 Question Id : 7225444731 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 l is fixed at the both ends carries a uniformly distributed load of w per unit length throughout the span. The bending moments at the end is

Options :

1. ✖ $wl^2/8$

2. ✔ $wl^2/12$

3. ✖ $wl^3/12$

4. ✖ $wl^2/24$

Question Number : 131 Question Id : 7225444732 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 6 m carries a point load 120 kN at its centre. The beam is fixed at both ends. The fixed end moment at the ends is

Options :

1. ✖ 40 kNm

2. ✔ 90 kNm

3. ✖ 120 kNm

4. ✖ 150 kNm

Question Number : 132 Question Id : 7225444733 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A beam fixed at both the ends carries a uniformly distributed load of 20 kN/m over the entire span of 6m. the bending moment at the centre of the beam is

Options :

1. ✖ 10 kNm

2. ✓ 30 kNm

3. ✗ 60 kNm

4. ✗ 90 kNm

Question Number : 133 Question Id : 7225444734 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A continuous beam 12 m long, supported over two spans 6 m each, carries a concentrated load of 40 kN each at the centre of each span. The bending at the centre of the support is

Options :

1. ✗ 30 kNm

2. ✓ 45 kNm

3. ✗ 90 kNm

4. ✗ 150 kNm

Question Number : 134 Question Id : 7225444735 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A member under compression only is called

Options :

1. ✖ Tie

2. ✔ Strut

3. ✖ Strut-tie

4. ✖ Shaft

Question Number : 135 Question Id : 7225444736 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A frame in which the number of members is less than (2j – 3) is known as

Options :

1. ✖ Redundant frame

2. ✔ Deficient frame

3. ✖ Perfect frame

4. ✖ Stable frame

Question Number : 136 Question Id : 7225444737 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 l carries a uniformly distributed load of w per unit run over its entire span. The value of prop reaction to keep the beam horizontal is

Options :

1. ✗ $wl/3$

2. ✓ $3wl/8$

3. ✗ $wl/2$

4. ✗ $5wl/8$

Question Number : 137 Question Id : 7225444738 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 ABC of length l carries a concentrated load P at an intermediate point B. If slope at A is 0.75 times the slope at C, then length of portion AB is equal to

Options :

1. ✗ $\frac{3}{4}l$

2. ✗ $\frac{4}{7}l$

3. ✓ $\frac{5}{7}l$

4. ✗ $\frac{2}{7}l$

Question Number : 138 Question Id : 7225444739 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the deflection at the free end of a uniformly loaded cantilever beam of length 1 m is equal to 7.5 mm, then the slope at the free end is

Options :

1. ✓ 0.01 radian

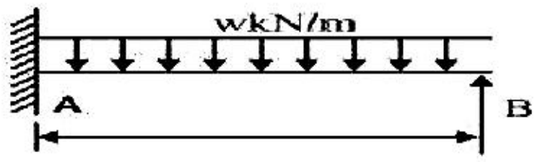
2. ✗ 0.015 radian

3. ✗ 0.02 radian

4. ✗ 0.001 radian

Question Number : 139 Question Id : 7225444740 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 A of the propped cantilever shown in fig is



Options :

1. ✓ $wl^2/8$

2. ✗ $wl^2/12$

3. ✗ $wl^2/6$

4. ✗ $wl/2$

Question Number : 140 Question Id : 7225444741 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 with rectangular cross-section is subjected to central concentrated load. If the width and depth of the beam are doubled, then the deflection at the centre of the beam will be reduced to

Options :

1. ✗ 50%

2. ✗ 25%

3. ✗ 12.5%

4. ✓ 6.25%

Question Number : 141 Question Id : 7225444742 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The partial safety factor specified in the Indian standard code for the combination of live, dead and wind loads is

Options :

1. ✗ 1.5

2. ✗ 1.6

3. ✓ 1.2

4. ✗ 1.0

Question Number : 142 Question Id : 7225444743 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The partial safety factor used for material strength of steel at the limit state of collapse is

Options :

1. ✖ 1.5

2. ✔ 1.15

3. ✖ 1.10

4. ✖ 1.6

Question Number : 143 Question Id : 7225444744 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per IS: 456 – 2000, to prevent brittle failure, the IS code prescribes that the failure strain in steel should be more

Options :

1. ✖ $\frac{0.87 f_y}{E_s} + 0.0015$

2. ✖ $\frac{0.87 f_y}{E_s} + 0.0005$

3. ✔ $\frac{0.87 f_y}{E_s} + 0.002$

4. ✗ $\frac{0.87 f_y}{E_s} + 0.0035$

Question Number : 144 Question Id : 7225444745 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per IS: 456 – 2000, the ultimate strain in concrete at the limit state of collapse in flexure is

Options :

1. ✗ 0.0025

2. ✓ 0.0035

3. ✗ 0.0045

4. ✗ 0.002

Question Number : 145 Question Id : 7225444746 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the neutral axis depth is less than the flange thickness while computing the flexural strength of flanged sections, then the flanged section can be considered as a rectangular section having a width equal to

Options :

1. ✗ Width of the rib

2. ✗ Width of the flange minus width of the rib

3. ✓ Width of flange

4. ✗ Half of flange width

Question Number : 146 Question Id : 7225444747 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, 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 short span

4. ✗ Independent of Continuity

Question Number : 147 Question Id : 7225444748 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The critical section for shear in a reinforced concrete beam is located at

Options :

1. ✗ Quarter span

2. ✗ Mid span

3. ✓ A distance equal to the effective depth from the support

4. ✗ A distance equal to two times the effective depth from support

Question Number : 148 Question Id : 7225444749 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum spacing of shear reinforcement used as vertical stirrups expressed as a percentage of the effective depth should not exceed the value

Options :

1. ✗ 0.95

2. ✗ 0.65

3. ✓ 0.75

4. ✗ 0.85

Question Number : 149 Question Id : 7225444750 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shear strength of concrete in RCC beam depends upon

Options :

1. ✗ Overall depth of the beam

2. ✓ Percentage reinforcement and grade of concrete

3. ✗ Span of the beam

4. ✗ Grade of steel

Question Number : 150 Question Id : 7225444751 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A T-beam roof section has the following particulars:

Thickness of slab	: 100mm
Width of rib	: 300 mm
Depth of beam	: 500 mm
Centre to centre distance of beams	: 3.0 m
Effective span of beams	: 6.0 m
Distance between points of contraflexure	: 3.60 m

The effective width of flange of the beam is

Options :

1. ✗ 3000 mm

2. ✗ 1900 mm

3. ✗ 1600 mm

4. ✓ 1500 mm

Question Number : 151 Question Id : 7225444752 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Maximum permissible final deflection of a reinforced concrete beam including all the effects of loads, creep and shrinkage should not exceed

Options :

1. ✗ Span/350

2. ✓ Span/250

3. ✗ Span/480

4. ✗ Span/320

Question Number : 152 Question Id : 7225444753 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The deflection of a reinforced concrete beam due to shrinkage depends upon

Options :

1. ✗ Loads on the beam

2. ✓ Shrinkage strain

3. ✗ Creep coefficient

4. ✗ Grade of steel

Question Number : 153 Question Id : 7225444754 Display Question Number : Yes Is Question Mandatory : No Calculator : None
Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The limits of percentage 'p' of the longitudinal reinforcement in a column is

Options :

1. ✗ 0.15 % to 2%

2. ✗ 0.8% to 4%

3. ✓ 0.8% to 6%

4. ✗ 0.8% to 8%

Question Number : 154 Question Id : 7225444755 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

L-beam should be designed for

Options :

1. ✗ Flexure

2. ✗ Torsion

3. ✓ Flexure, torsion and shear

4. ✗ Flexure and torsion only

Question Number : 155 Question Id : 7225444756 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 cantilever beams, the main reinforcements to resist tension are generally provided at the

Options :

1. ✓ Top of the member

2. ✗ Soffit of the member

3. ✗ Middle of the member

4. ✗ The neutral axis

Question Number : 156 Question Id : 7225444757 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The diameter of main reinforcements in a column should not be less than

Options :

1. ✗ 25 mm

2. ✗ 16 mm

3. ✓ 12 mm

4. ✗ 8 mm

Question Number : 157 Question Id : 7225444758 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum cover to reinforcements in columns should no be less than

Options :

1. ✗ 25 mm

2. ✗ 30 mm

3. ✓ 40 mm

4. ✗ 32mm

Question Number : 158 Question Id : 7225444759 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Corner columns in a multistorey framed building should be designed for

Options :

1. ✗ Axial loads only

2. ✗ Combined axial loads and uniaxial bending moment only

3. ✓ Combined axial load and biaxial bending moment

4. ✗ Biaxial bending moment only

Question Number : 159 Question Id : 7225444760 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Reinforced concrete columns should be designed for a minimum eccentricity of

Options :

1. ✗ 25 mm

2. ✗ 0.05 times the lateral dimension

3. ✓ 20 mm

4. ✗ 16 mm

Question Number : 160 Question Id : 7225444761 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Shear span is defined as the zone where

Options :

1. ✗ Bending moment is zero

2. ✗ Shear force is zero

3. ✓ Shear force is constant

4. ✗ Bending moment is constant

Question Number : 161 Question Id : 7225444762 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 30m chain was found to be 20 cm too long after chaining 1500 m. The correct length of the total distance chained will be

Options :

1. ✗ 1495 m

2. ✗ 1500 m

3. ✗ 1505 m

4. ✓ 1490 m

Question Number : 162 Question Id : 7225444763 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The main difference between optical square and prism square is

Options :

1. ✓ No adjustment is required in a prism square as the angle between the reflecting mirrors is fixed

2. ✗ Optical square is more accurate

3. ✗ Principal of working is different

4. ✗ Optical square and prism square are equally accurate

Question Number : 163 Question Id : 7225444764 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Isogonic lines are lines passing through

Options :

1. ✓ Points having same declination at a given point

2. ✗ Point of zero declination

3. ✗ Point having same dip

4. ✗ Point having zero dip

Question Number : 164 Question Id : 7225444765 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Survey stations set up during traversing with compass should be such that

Options :

1. ✗ They are visible from each other

2. ✗ Chaining between them is easy

3. ✓ The lines joining them are near the objects to be located

4. ✗ They are as long as possible

Question Number : 165 Question Id : 7225444766 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 10cm theodolite means that

Options :

1. ✗ Length of its telescope is 10cm

2. ✗ Height of the telescope is 10cm

3. ✓ Diameter of the graduated circle of its lower plate is 10cm

4. ✗ Diameter of the graduated circle of its vertical circle is 10cm

Question Number : 166 Question Id : 7225444767 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Image of the objective formed should lie

Options :

1. ✗ At the eyepiece

2. ✓ In the plane of cross hairs

3. ✗ At the centre of the eyepiece

4. ✗ At the optical centre of the eye piece

Question Number : 167 Question Id : 7225444768 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In levelling height of instrument is

Options :

1. ✗ Height of telescope above the ground at the time of observation

2. ✗ Height of levelling staff

3. ✓ Elevation of line of collimation

4. ✗ Sum of the reduced level of B.M and foresight

Question Number : 168 Question Id : 7225444769 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Permanent adjustments are carried out to

Options :

1. ✗ Set up of the level

2. ✓ Establish a fixed relationship between its fundamental axes

3. ✗ Focus the eyepiece

4. ✗ Focus the object glass

Question Number : 169 Question Id : 7225444770 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The contour interval depends upon

Options :

1. ✓ Nature of the ground

2. ✗ Type of the soil

3. ✗ Type of surveying

4. ✗ Type of instruments used

Question Number : 170 Question Id : 7225444771 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Size of theodolite is specified by

Options :

1. ✓ Diameter of lower plate

2. ✗ Diameter of upper plate

3. ✗ Length of telescope

4. ✗ Diameter of vertical circle

Question Number : 171 Question Id : 7225444772 Display Question Number : Yes Is Question Mandatory : No Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The trunnion axis or transverse axis is

Options :

1. ✓ The axis about which telescope can be rotated in a vertical plane

2. ✗ The axis about which telescope can be rotated in a horizontal plane

3. ✗ Also called line of collimation

4. ✗ Axis of plate level

Question Number : 172 Question Id : 7225444773 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

'SPIRE TEST' is used in permanent adjustment of theodolite for adjusting the

Options :

1. ✗ Plate levels

2. ✗ Line of sight

3. ✗ Vertical axis

4. ✓ Horizontal axis

Question Number : 173 Question Id : 7225444774 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The included angles of a theodolite traverse, are generally measured

Options :

1. ✓ Clockwise from the back station

2. ✗ Clockwise from the forward station

3. ✗ Anticlockwise from the forward station

4. ✗ Anticlockwise from the back station

Question Number : 174 Question Id : 7225444775 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bowditch rule is applied to

Options :

1. ✗ An open traverse for graphical adjustment

2. ✗ Determine effect of local attraction

3. ✓ A closed transverse for adjustment of closing error

4. ✗ Check angular measurements

Question Number : 175 Question Id : 7225444776 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Subtense bar is an instrument used for measurement of horizontal distance in

Options :

1. ✗ Undulated areas

2. ✗ Flat areas

3. ✓ Mountains

4. ✗ Along the coast

Question Number : 176 Question Id : 7225444777 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The variation in the volume of a liquid with the variation of pressure is called its

Options :

1. ✗ Surface tension

2. ✓ Compressibility

3. ✗ Capillarity

4. ✗ Viscosity

Question Number : 177 Question Id : 7225444778 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Kinematic viscosity is defined as equal to

Options :

1. ✓ Dynamic viscosity/density

2. ✖ Dynamic viscosity x density

3. ✖ Dynamic viscosity x pressure

4. ✖ Pressure x density

Question Number : 178 Question Id : 7225444779 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An ideal fluid is defined as the fluid which

Options :

1. ✖ is incompressible

2. ✖ is compressible

3. ✖ has negligible surface tension

4. ✔ is incompressible and non – viscous(inviscid)

Question Number : 179 Question Id : 7225444780 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A steady flow occurs

Options :

1. ✖ When the velocity does not change from place to place

2. ✔ When the velocity at a given point does not change with time

3. ✖ When the fluid particles move in an orderly manner

4. ✖ When the velocity is linearly increasing

Question Number : 180 Question Id : 7225444781 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Vorticity is

Options :

1. ✔ Two times the rotation

2. ✖ 1.5 times the rotation

3. ✖ Three times rotation

4. ✖ Equal to rotation

Question Number : 181 Question Id : 7225444782 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The continuity equation $\frac{\partial u}{\partial x}+\frac{\partial v}{\partial y}+\frac{\partial w}{\partial z}=0$

Options :

1. ✗ Is not valid for unsteady, incompressible fluids

2. ✓ Is valid for incompressible fluids whether the flow is steady

3. ✗ Is valid for steady flow, whether compressible or incompressible

4. ✗ Is valid for ideal fluid flow only

Question Number : 182 Question Id : 7225444783 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In order to measure the flow with a venturimeter, it is installed in _____

Options :

1. ✗ Vertical line

2. ✗ Inclined line with flow upwards

3. ✓ horizontal Line in any direction and in any location

4. ✗ Inclined line with flow downwards

Question Number : 183 Question Id : 7225444784 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bernoulli's theorem deals with the law of conversation of

Options :

1. ✗ Mass

2. ✗ Momentum

3. ✓ Energy

4. ✗ Power

Question Number : 184 Question Id : 7225444785 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An orifice is known as large orifice when the head of the liquid from the center of an orifice is

Options :

1. ✗ More than 10 times the depth of an orifice

2. ✗ Less than 10 times the depth of an orifice

3. ✓ Less than 5 times the depth of an orifice

4. ✗ More than 5 times the depth of an orifice

Question Number : 185 Question Id : 7225444786 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 of an orifice is 0.96. The head loss at the orifice while discharging under a head of 2.5 m is

Options :

1. ✗ 0.1

2. ✗ 0.104

3. ✓ 0.196

4. ✗ 0.213

Question Number : 186 Question Id : 7225444787 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a triangular notch, there is an error of 4% in observing the head. The error in the computed discharge is

Options :

1. ✗ 4%

2. ✓ 10%

3. ✗ 6%

4. ✗ 2.5%

Question Number : 187 Question Id : 7225444788 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A separate arrangement for the aeration of nappe is desired in

Options :

1. ✗ Triangular notch

2. ✓ Trapezoidal notch

3. ✗ Contracted rectangular notch

4. ✗ Circular notch

Question Number : 188 Question Id : 7225444789 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hydraulic mean depth for a circular pipe of diameter d is

Options :

1. ✖ $d/6$

2. ✔ $d/4$

3. ✖ $d/2$

4. ✖ d

Question Number : 189 Question Id : 7225444790 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

To avoid an interruption in the flow of a syphon, an air vessel is provided

Options :

1. ✖ At the inlet

2. ✖ At the outlet

3. ✔ At the summit

4. ✖ At any point between inlet and outlet

Question Number : 190 Question Id : 7225444791 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a centrifugal pump, the liquid enters the pump

Options :

1. ✔ At the center

2. ✘ At the bottom

3. ✘ At the top

4. ✘ from sides

Question Number : 191 Question Id : 7225444792 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The duty of a crop is 432 hectares/cumec, when the base period of the crop is 100 days. Delta for the crop will be---------- cm

Options :

1. ✘ 132

2. ✔ 200

3. ✘ 464

4. ✘ 864

Question Number : 192 Question Id : 7225444793 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Most accurate method for estimating mean rainfall over a catchment, is

Options :

1. ✗ Arithmetic mean method

2. ✗ Thiessen's polygon method

3. ✓ Isohyetal method

4. ✗ Unit hydrograph method

Question Number : 193 Question Id : 7225444794 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The base width of an elementary profile of a gravity dam, when pressure is neglected, is given by_____ Where H is depth of water, Ø is specific gravity of dam material and μ is coefficient of friction

Options :

1. ✗ $\frac{H}{\emptyset}$

2. ✓ $\frac{H}{\sqrt{\emptyset}}$

3. ✖ Greater of $\frac{H}{\sqrt{\phi}}$ and $\frac{H}{\mu\phi}$

4. ✖ Lesser of $\frac{H}{\sqrt{\phi}}$ and $\frac{H}{\mu\phi}$

Question Number : 194 Question Id : 7225444795 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In gravity dam, the main overturning force is

Options :

1. ✖ Self-weight of the dam

2. ✖ Wind pressure

3. ✔ Water pressure

4. ✖ Uplift pressure

Question Number : 195 Question Id : 7225444796 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For economical design of a gravity dam, the shear friction factor should be

Options :

1. ✔ 1.50 to 4.0

2. ✖ 1

3. ✖ Between 1 and 2

4. ✖ 0.65

Question Number : 196 Question Id : 7225444797 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If base period for a particular crop is 50 days and the duty of the canal is 500 hectares for per cumec, then depth of water will be

Options :

1. ✖ 0.864 cm

2. ✖ 8.64 cm

3. ✔ 86.4 cm

4. ✖ 864 cm

Question Number : 197 Question Id : 7225444798 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a stream carrying a discharge of 4 cumecs per meter width is having a silt factor 2.0, then the lacey scour depth will be

Options :

1. ✗ 3.4 m

2. ✗ 5.4 m

3. ✓ 2.7 m

4. ✗ 1.35 m

Question Number : 198 Question Id : 7225444799 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A balancing reservoir

Options :

1. ✗ Balances peak and minimum flows

2. ✗ Balances the distribution

3. ✓ Balances flow rates of supply and demand

4. ✖ Stores water for emergencies

Question Number : 199 Question Id : 7225444800 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If duty (D) is 1428 hectares/cumec and base period (B) is 120 days for an irrigated crop, then delta in meters is given by

Options :

1. ✖ 102.8

2. ✔ 0.73

3. ✖ 1.38

4. ✖ 0.01

Question Number : 200 Question Id : 7225444801 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A sprinkler irrigation system is suitable when

Options :

1. ✔ The land gradient is steep and the soil is easily erodible

2. ✖ The soil is having low permeability

3. ✖ The water table is low

4. ✖ The crops to be grown have deep roots