Question Paper Preview

Question Paper Name:	Civil Engineering 30th April 2019 Shift 1
Subject Name:	Civil Engineering
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Mathematics

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

Question Number : 1 Question Id : 67809438257 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The adjoint of $A = \begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{pmatrix}$ is

Options :

1. $\begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{pmatrix}$

2. $\begin{pmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{pmatrix}$

3. $\begin{pmatrix} 3 & 0 & 6 \\ 6 & 3 & 0 \\ 9 & 6 & 3 \end{pmatrix}$

4. $\begin{pmatrix} 3 & 2 & 1 \\ 4 & 1 & -1 \\ 0 & 3 & 4 \end{pmatrix}$

Question Number : 2 Question Id : 67809438258 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If A is a square matrix of order 3 then (adj A).A=

Options :

1. A. (adj A)

2. A× (adj A)

3. A- (adj A)

4. A+ (adj A)

Question Number : 3 Question Id : 67809438259 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The inverse of $A=\begin{pmatrix}2 & 3\\ 2 & 5\end{pmatrix}$ is

Options :

1. $\begin{pmatrix}5/4 & -3/4\\ 1/2 & 1/2\end{pmatrix}$

2. $\begin{pmatrix}5/4 & 3/4\\ -1/2 & 1/2\end{pmatrix}$

3. $\begin{pmatrix}5/4 & -5/4\\ -1/2 & 1/2\end{pmatrix}$

4. $\begin{pmatrix}5/4 & -3/4\\ -1/2 & 1/2\end{pmatrix}$

Question Number : 4 Question Id : 67809438260 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $A=\begin{pmatrix}3 & 2 & x\\ 4 & 1 & -1\\ 0 & 3 & 4\end{pmatrix}$ is a singular matrix then the value of x is

Options :

1. $11/12$

2. $-11/12$

3. $13/12$

4. $5/4$

Question Number : 5 Question Id : 67809438261 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If A=$\begin{pmatrix} 3 & 1 \\ -1 & 2 \end{pmatrix}$ then $A^2 - 5A + 7I$ is

Options :

1. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

2. $\begin{pmatrix} 0 & 3 \\ 2 & 0 \end{pmatrix}$

3. $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

4. $\begin{pmatrix} 2 & 3 \\ 2 & 5 \end{pmatrix}$

Question Number : 6 Question Id : 67809438262 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Resolve $\frac{3x+7}{(x-1)(x-2)}$ into partial fractions

Options :

1. $\frac{12}{(x-2)} - \frac{10}{(x-1)}$

2. $\frac{13}{(x-2)} - \frac{10}{(x-1)}$

3. $\frac{13}{(x-5)} - \frac{10}{(x-1)}$

4. $\frac{13}{(x-2)} - \frac{10}{(x-7)}$

Question Number : 7 Question Id : 67809438263 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Resolve $\frac{5x^2+1}{x^3-1}$ into partial fractions

Options :

1. $\frac{12}{(x-2)} - \frac{10}{(x-1)}$

2. $\frac{13}{(x-2)} - \frac{10}{(x-1)}$

3. $\frac{13}{(x-5)} - \frac{10}{(x-1)}$

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

Question Number : 8 Question Id : 67809438264 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $tan^2\theta + sec\theta = 5$ then the value of $\cos\theta$ is

Options :

1. $-1/3$ *or* $1/2$

2. $-11/12$ *or* $1/2$

3. $13/12$ or $-1/3$

4. $5/4$ *or* $1/2$

Question Number : 9 Question Id : 67809438265 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $16sin^3\theta + 8cos^3\theta$ is

Options :

1. 3

2. 1

3. -3

4. 0

Question Number : 10 Question Id : 67809438266 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $sin\alpha = {}^{15}/_{17}$, $cos\beta = {}^{12}/_{13}$ then the value of $sin(\alpha + \beta)$ is

Options :

1. ${}^{110}/_{105}$

2. $-{}^{121}/_{152}$

3. ${}^{220}/_{221}$

4. ${}^{5}/_{4}$

Question Number : 11 Question Id : 67809438267 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $cos20^0 cos40^0 cos60^0 cos80^0$ is

Options :

1. ${}^{11}/_{12}$

2. ${}^{1}/_{16}$

3. ${}^{13}/_{12}$

4. ${}^{5}/_{4}$

Question Number : 12 Question Id : 67809438268 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\frac{\cos 17^0 + \sin 17^0}{\cos 17^0 - \sin 17^0}$ is

Options :

1. $\cos 20^0$

2. $\tan 65^0$

3. $\tan 60^0$

4. $\tan 62^0$

Question Number : 13 Question Id : 67809438269 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\sin\frac{\pi}{5}\sin\frac{2\pi}{5}\sin\frac{3\pi}{5}\sin\frac{4\pi}{5} =$

Options :

1. $\frac{4}{15}$

2. $\frac{5}{16}$

3. $\frac{-5}{16}$

4. $\frac{7}{15}$

Question Number : 14 Question Id : 67809438270 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \frac{\pi}{2}$ then the value of $xy + yz + zx$ is

Options :

1. -1

2. 3

3. 5

4. 1

Question Number : 15 Question Id : 67809438271 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The general solution of $4\cos^2 x - 3 = 0$ is

Options :

1. $2n\pi \pm \frac{\pi}{6}$

2. $2n\pi \pm \frac{7\pi}{6}$

3. $3n\pi \pm \frac{5\pi}{6}$

4. $2n\pi \pm \frac{11\pi}{6}$

Question Number : 16 Question Id : 67809438272 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The modulus of a complex number $\sqrt{3}+i$ is

Options :

1. -2

2. 3

3. 2

4. 5

Question Number : 17 Question Id : 67809438273 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $(a-b)^2 cos^2\left(\frac{C}{2}\right)+(a+b)^2 sin^2\left(\frac{C}{2}\right)$ is

Options :

1. C^3

2. C

3. C^5

4. C^2

Question Number : 18 Question Id : 67809438274 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $x+\frac{1}{x}=2\cos\theta$ then the value of $x^n+\frac{1}{x^n}$ is

Options :

1. $2\cos n\theta$

2. $-2\cos n\theta$

3. $3\cos\theta$

4. $2\sin n\theta$

Question Number : 19 Question Id : 67809438275 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $2tan^{-1}\left(\frac{1}{3}\right)+tan^{-1}\left(\frac{1}{7}\right)$ is

Options :

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

2. $-\frac{\pi}{4}$

3. $\frac{\pi}{6}$

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

Question Number : 20 Question Id : 67809438276 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The length of the major axis of the ellipse: $4x^2+3y^2=48$ is

Options :

1. 10

2. 11

3. 12

4. 13

Question Number : 21 Question Id : 67809438277 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Centre of the ellipse: $9x^2+25y^2-18x+100y-116=0$ is

Options :

1. $(2,-1)$

2. $(-1,-2)$

3. $(1,-2)$

4. $(1,2)$

Question Number : 22 Question Id : 67809438278 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The equation of the parabola with vertex $(2,-1)$ and focus $(2,-3)$ is

Options :

1. $x^2-4x+8y+12=0$

2. $x^2-4x-8y-12=0$

3. $x^2+4x-8y-12=0$

4. $x^2+5x-8y-11=0$

Question Number : 23 Question Id : 67809438279 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The length of the latus rectum of the hyperbola: $\frac{x^2}{9}-\frac{y^2}{16}=1$ is

Options :

1. 9 units

2. 5 units

3. 6 units

4. 13 units

Question Number : 24 Question Id : 67809438280 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the length of latus rectum is $\frac{9}{2}$ and the distance between its foci is 10 then the equation of hyperbola is

Options :

1. $\frac{x^2}{16}+\frac{y^2}{9}=1$

2. $\frac{x^2}{18}-\frac{y^2}{9}=1$

3. $\frac{x^2}{16}-\frac{y^2}{6}=1$

4. $\frac{x^2}{16}-\frac{y^2}{9}=1$

Question Number : 25 Question Id : 67809438281 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The equation of the parabola with focus at (-3.2) and vertex (-2.2) is

Options :

1. $x^2-4x+8y+12=0$

2. $x^2+5x-8y-11=0$

3. $y^2+4x-4y+12=0$

4. $x^2-4x-8y-12=0$

Question Number : 26 Question Id : 67809438282 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $y=\frac{a+bx}{b-ax}$ then the derivative of y with respect to x is

Options :

1. $\frac{a^2+b^2}{(b-ax)^2}$

2. $\frac{a^2+b^2}{(b+ax)^2}$

3. $\frac{a^2-b^2}{(b-ax)^2}$

4. $\frac{a+b}{(b-ax)^2}$

Question Number : 27 Question Id : 67809438283 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $y = \frac{2+3\sinh x}{3+2\sinh x}$ then the derivative of y with respect to x is

Options :

1. $\frac{5\cosh x}{(3+2\sinh x)^2}$

2. $\frac{5\sinh x}{(3+2\sinh x)^2}$

3. $\frac{5\sin x}{(3-2\cosh x)^2}$

4. $\frac{sinh^2 x}{(2-3\sinh x)^2}$

Question Number : 28 Question Id : 67809438284 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The range of x for which the function $x^3 - 3x^2 - 45x + 2$ is increasing with x is

Options :

1. $(3, -5)$

2. $(-3, -5)$

3. $(3,5)$

4. $(-3,5)$

Question Number : 29 Question Id : 67809438285 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If u is a homogeneous function of x and y with degree n then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} =$

Options :

1. $-nu$

2. n^2u

3. nu

4. $nu^2 + u$

Question Number : 30 Question Id : 67809438286 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The angle between the curves $y = x^2 + 3x - 7$ and $y^2 = 2x + 5$ at $(2,3)$ is

Options :

1. $\tan\theta = 2$

2. $\sec\theta = 2$

3. $\cos\theta = 1$

4. $\sin\theta = 3$

Question Number : 31 Question Id : 67809438287 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The maximum value of the function $2x^3 - 12x^2 + 18x + 5$ is

Options :

1. 13

2. 12

3. 10

4. 15

Question Number : 32 Question Id : 67809438288 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The three sides of a trapezium are equal each being 6" long then the area of the trapezium when it is maximum is

Options :

1. 27 square units

2. 33 square units

3. $27\sqrt{3}$ square units

4. $29\sqrt{3}$ square units

Question Number : 33 Question Id : 67809438289 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The interval in which the function $f(x) = x^2 logx$ is an increasing function is

Options :

1. $(1\ ,\ e^{-1/2}\ )$

2. $(2\ ,\ e^{-1/2}\ )$

3. $(0\ ,\ e^{1/2}\ )$

4. $(0\ ,\ e^{-1/2}\ )$

Question Number : 34 Question Id : 67809438290 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The stationary points and the corresponding values of the function $f(x) = x^3 - 9x^2 + 15x - 1$ is

Options :

1. 6,-26

2. 3,-26

3. 6,26

4. -6,-26

Question Number : 35 Question Id : 67809438291 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If $u = \log\left(\frac{x^2+y^2}{x+y}\right)$ then $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}$ =

Options :

1. 2

2. 4

3. 5

4. 1

Question Number : 36 Question Id : 67809438292 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int \log x \, dx$ is

Options :

1. $x \log x + x + c$

2. $x^2 \log x - x + c$

3. $x \log x - x + c$

4. $x \log x - \frac{x^2}{2} + c$

Question Number : 37 Question Id : 67809438293 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\lim_{n\to\infty} \left[\frac{1}{n+1} + \frac{1}{n+2} + \cdots .. + \frac{1}{n+n}\right]$ is

Options :

1. $\log 2$

2. $\log 3$

3. $-\log 2$

4. $\log n$

Question Number : 38 Question Id : 67809438294 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int \frac{\cos\sqrt{x}}{\sqrt{x}} dx$ is

Options :

1. $2 \sin \sqrt{x} + c$

2. $3 \sin \sqrt{x} + c$

3. $2 \sin x + c$

4. $\sin\sqrt{x}+c$

Question Number : 39 Question Id : 67809438295 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The area enclosed between the curve $y^2 = 4ax$ and the line $x = 2y$ is

Options :

1. $\frac{64}{5}$ sq. units

2. $\frac{64}{3}$ sq. units

3. $\frac{65}{4}$ sq. units

4. $\frac{63}{4}$ sq. units

Question Number : 40 Question Id : 67809438296 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_1^{\frac{\pi}{2}} sin^2x\,dx$ is

Options :

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

2. $-\frac{\pi}{4}$

3. $\frac{\pi}{6}$

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

Question Number : 41 Question Id : 67809438297 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_1^4 \left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)dx$ is

Options :

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

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

3. $\frac{10}{3}$

4. $\frac{15}{3}$

Question Number : 42 Question Id : 67809438298 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_0^{\pi/4} \sqrt{1+sin2x}\, dx =$

Options :

1. -1

2. -3

3. 3

4. 1

Question Number : 43 Question Id : 67809438299 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The value of $\int_0^{\pi/2} \frac{sinx}{1+cos^2x}\, dx =$

Options :

1. $\pi/4$

2. $-\pi/4$

3. $\pi/3$

4. $\pi/2$

Question Number : 44 Question Id : 67809438300 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The particular integral of $(D^2+5D+6)y = e^x$ is

Options :

1. $\frac{-e^{-x}}{12}$

2. $\frac{e^{2x}}{12}$

3. $\frac{e^{x}}{12}$

4. $\frac{e^{x}}{6}$

Question Number : 45 Question Id : 67809438301 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Form the differential equation by eliminating the arbitrary constant a from $ay^2 = x^3$

Options :

1. $\frac{dy}{dx} = \frac{3y}{2x}$

2. $\frac{dy}{dx} = \frac{2x}{3y}$

3. $\frac{dy}{dx} = \frac{x}{y}$

4. $\frac{dy}{dx} = \frac{2y}{x}$

Question Number : 46 Question Id : 67809438302 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The solution of $\frac{dy}{dx} + y = e^{-x}$ is

Options :

1. $(x + c)e^{-x}$

2. $(x - c)e^{x}$

3. $(x + c)e^{x}$

4. $(x + c)e^{-2x}$

Question Number : 47 Question Id : 67809438303 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The complementary function of $(D^2 + 3D + 2)y = 8sin5x$ is

Options :

1. $c_1e^{-x} + c_2e^{-2x}$

2. $c_1e^{x} + c_2e^{2x}$

3. $c_1e^{-x} + c_2e^{2x}$

4. $c_1e^{2x} + c_2e^{3x}$

Question Number : 48 Question Id : 67809438304 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The solution of exact differential equation $2xy\,dx + x^2dy = 0$ is

Options :

1. $x^2y^2 = c$

2. $x^2y = c$

3. $x^3y = c$

4. $x^2y^3 = c$

Question Number : 49 Question Id : 67809438305 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Form the differential equation representing the family of curves $x^2 = 4ay$, where a is any arbitrary constant

Options :

1. $x\frac{dy}{dx} - 2y = 0$

2. $x\frac{dy}{dx} + 2y = 0$

3. $x\frac{dy}{dx} - 6y = 0$

4. $x\frac{dy}{dx} - y = 0$

Question Number : 50 Question Id : 67809438306 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The solution of $\frac{dy}{dx} + y\cot x = \cos x$ is

Options :

1. $y\sin x = \frac{-\cos 2x}{4} + c$

2. $y\sin x = \frac{\cos 2x}{4} + c$

3. $y\sin x = \frac{-\cos 5x}{4} + c$

4. $y\cos x = \frac{-\cos 2x}{4} + c$

Physics

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

Question Number : 51 Question Id : 67809438307 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the equation $\frac{\alpha}{t^2} = Fv + \frac{\beta}{x^2}$ the dimensional formula for [α], [β] is (here t = time, F= force, v = velocity, x = distance)

Options :

1. $MLT^{-1},\ MLT^{-3}$

2. $ML^2T,\ ML^4T^2$

3. $ML^2T^{-1},\ ML^4T^{-3}$

4. $ML^3T^{-1},\ MLT^{-3}$

Question Number : 52 Question Id : 67809438308 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following quantities has not been expressed in proper units?

Options :

1. Young's modulus=N/m^2

2. Surface tension=N/m

3. Pressure = N/m^2

4. Energy=kg m/s

Question Number : 53 Question Id : 67809438309 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three vectors A, B and C satisfy the relation A.B=0 and A.C=0. The vector A is parallel to

Options :

1. B

2. C

3. B.C

4. BxC

Question Number : 54 Question Id : 67809438310 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If three vectors A, B and C are 12, 5 and 13 in magnitude such that C=A+B, then the angle between A and B is

Options :

1. 60^0

2. 90^0

3. 120^0

4. 30^0

Question Number : 55 Question Id : 67809438311 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A stone dropped from a certain height, can reach the ground in 5s. It is stopped after 3 seconds of its fall and then allowed to fall again. The time taken by the stone to reach the ground for the remaining distance is

Options :

1. 2 s

2. 6 s

3. 4 s

4. 1 s

Question Number : 56 Question Id : 67809438312 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The range of projectile fired at an angle of 15^0 is 50m. If it is fired with the same speed at an angle of 45^0, its range will be

Options :

1. 25 m

2. 37 m

3. 50 m

4. 100 m

Question Number : 57 Question Id : 67809438313 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A freely falling body acquires a velocity 'v' m/s in falling through a distance of 80m. How much further distance should it fall, so as to acquire a velocity of '2v' m/s?(Take g=10 m/s^2)

Options :

1. 240 m

2. 200 m

3. 400 m

4. 280 m

Question Number : 58 Question Id : 67809438314 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A block is projected along a rough horizontal road with a speed of 10 m/s. If the coefficient of kinetic friction is 0.10, how far will it travel before coming to rest ?

Options :

1. 50 m

2. 60 m

3. 40 m

4. 10 m

Question Number : 59 Question Id : 67809438315 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

What force is required to push a 200 N body up a 30^0 smooth incline with an acceleration of 2 m/s^2? The force is to be applied along the plane is (Take g=10 m/s^2)

Options :

1. 40 N

2. 60 N

3. 80 N

4. 140 N

Question Number : 60 Question Id : 67809438316 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A block of mass 2 kg rests on a rough inclined plane making an angle of 30^0 with the horizontal. The coefficient of static friction between the block and the plane is 0.7. The frictional force on the block is

Options :

1. 9.8N

2. 0.78 x 9.8 N

3. 9.8 x $\sqrt{3}$ N

4. 0.7 x 9.8$\sqrt{3}$ N

Question Number : 61 Question Id : 67809438317 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A man moves on a straight horizontal road with a block of mass 2 kg in his hand. If he covers a distance of 40 m with an acceleration of 0.5 m/s^2, the work done by the man on the block during the motion is (Take g=10 m/s^2)

Options :

1. 40 J

2. 1 J

3. 80 J

4. 20 J

Question Number : 62 Question Id : 67809438318 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a factory it is desired to lift 2000 kg of metal through a distance of 12 m in 1 minute. The minimum horse power of the engine to be used is

Options :

1. 3.5

2. 5.3

3. 4.3

4. 5.8

Question Number : 63 Question Id : 67809438319 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Energy harnessed from flowing water is called --------- energy

Options :

1. Hydel

2. Solar

3. Tidal

4. Geothermal

Question Number : 64 Question Id : 67809438320 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When a particle executing simple harmonic motion passes through the mean position, it has

Options :

1. minimum K.E and maximum P.E.

2. maximum K.E and maximum P.E.

3. maximum K.E and minimum P.E.

4. mimimum K.E. and mimimum P.E.

Question Number : 65 Question Id : 67809438321 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A particle of mass 200 g executes a simple harmonic motion. The restoring force is provided by a spring of spring constant 80 N/m. The time period is

Options :

1. 0.2 s

2. 0.41 s

3. 0.31 s

4. 0.5 s

Question Number : 66 Question Id : 67809438322 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The temperature at which the speed of sound will be double of its value at 0^0C is

Options :

1. 819^0 C

2. 850^0C

3. 919^0C

4. 900^0C

Question Number : 67 Question Id : 67809438323 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the source of sound moves towards an observer, then

Options :

1. The frequency of the source is increased

2. The velocity of sound in the medium is increased

3. The wavelength of sound in the medium towards the observer is decreased

4. The amplitude of vibration of the particles is increased.

Question Number : 68 Question Id : 67809438324 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A cinema hall has a volume of 7500 m^3. The total absorption in the hall if the reverberation time of 1.5 s is to be maintained is

Options :

1. 800 OWU

2. 925 OWU

3. 950 OWU

4. 825 OWU

Question Number : 69 Question Id : 67809438325 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

One mole of oxygen is heated at constant pressure starting at 0^0C. The heat energy that must be supplied to the gas to double its volume is

Options :

1. 2.5 x 273 x R

2. 3.5 x 273 x R

3. 2.5 x 546 x R

4. 3.5 x 546 x R

Question Number : 70 Question Id : 67809438326 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A vessel contains a gas at a temperature of 27^0C and a pressure of 20 atm. If one half of the gas is released and the temperature of the remaining gas is raised by 50^0C, the new pressure will be

Options :

1. 12.24 atm

2. 11.67 atm

3. 13.79 atm

4. 11 atm

Question Number : 71 Question Id : 67809438327 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The temperature of 5 gm of air is raised from 0^0 C to 1^0 C. The increase in the internal energy of air is (C_v = 0.172 cal/gm/ ^{0} C and J = 4.18 x 10^7 erg/cal)

Options :

1. 3.595 x 10^7 erg

2. 3 x 10^7 erg

3. 4.5 x 10^7 erg

4. 2.595 x 10^7 erg

Question Number : 72 Question Id : 67809438328 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In all reversible processes entropy of the system

Options :

1. decreases

2. increases

3. remains constant

4. remains zero

Question Number : 73 Question Id : 67809438329 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If one mole of a monoatomic gas ('Y'=5/3) is mixed with one mole of a diatomic gas ('Y'=7/5), the value of 'Y' for the mixture is

Options :

1. 1.40

2. 1.50

3. 1.53

4. 3.07

Question Number : 74 Question Id : 67809438330 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Electrons are emitted with zero velocity from a certain metal surface when it is exposed to radiations of wavelength 7000 A^0. The work function of the metal is

Options :

1. 1 eV

2. 1.52 eV

3. 2.52 eV

4. 1.77 eV

Question Number : 75 Question Id : 67809438331 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A superconducting material exhibits

Options :

1. zero conductivity and complete diamagnetism

2. zero resistivity and complete paramagnetism

3. infinite conductivity and complete paramagnetism

4. zero resistivity and complete diamagnetism

Display Number Panel: Yes
Group All Questions: No

Question Number : 76 Question Id : 67809438332 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The splitting of spectral lines in a strong magnetic field is called

Options :

1. Stark effect

2. Pauli Exclusion Principle

3. Zeeman effect

4. Aufbau Principle

Question Number : 77 Question Id : 67809438333 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Bohr's model can explain

Options :

1. The spectrum of hydrogen atom only

2. The spectrum of hydrogen molecule

3. The solar spectrum

4. Spectrum of an atom or ion containing one electron only

Question Number : 78 Question Id : 67809438334 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The maximum number of electrons that a d-orbital can accommodate is

Options :

1. 2

2. 6

3. 10

4. 14

Question Number : 79 Question Id : 67809438335 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Magnesium Atomic number is 12, which of the following is the electronic configuration

Options :

1. $1S^2\ 2S^1\ 2P^6\ 3S^2$

2. $1S^2\ 2S^2\ 2P^5\ 3S^2$

3. $1S^2\ 2S^2\ 2P^6\ 3S^2$

4. $1S^2\ 2S^2\ 2P^6\ 3S^1 3d^1$

Question Number : 80 Question Id : 67809438336 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

N_2 molecule contains

Options :

1. Covalent bond

2. Ionic bond

3. Hydrogen bond

4. Metalic bond

Question Number : 81 Question Id : 67809438337 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

One mole of any of the particles contains

Options :

1. $6.023X\ 10^{-23}$

2. $6.022X\ 10^{23}$

3. $60.23X\ 10^{23}$

4. $6.023X\ 10^{25}$

Question Number : 82 Question Id : 67809438338 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The normality of the solution obtained by dissolving 4 gm of NaOH in 1Litre is

Options :

1. 1N

2. 0.1N

3. 0.5N

4. 0.02N

Question Number : 83 Question Id : 67809438339 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Molecular weight of H_2SO_4 is

Options :

1. 92

2. 96

3. 98

4. 99

Question Number : 84 Question Id : 67809438340 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A Lewis acid is a substance which

Options :

1. Accept protons

2. Accept a lone pair of electrons

3. Donate protons

4. Donate a lone pair of electrons

Question Number : 85 Question Id : 67809438341 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

P^H of a solution is 9.5, the solution is

Options :

1. Basic

2. Acidic

3. Neutral

4. Amphoteric

Question Number : 86 Question Id : 67809438342 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Laws of electrolysis were given by

Options :

1. Ostwald

2. Faraday

3. Arrhenius

4. Volta

Question Number : 87 Question Id : 67809438343 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Common electrolyte used in the salt bridge is

Options :

1. NaOH

2. $NaCO_3$

3. KCl

4. KOH

Question Number : 88 Question Id : 67809438344 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Standard Reduction Potential of an element is equal to

Options :

1. 1 X Its reduction potential

2. -1 X Its standard oxidation potential

3. -1 X Its reduction potential

4. 1 X Its standard oxidation potential

Question Number : 89 Question Id : 67809438345 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The standard emf for the cell reaction, $Zn+Cu^{+2} \rightarrow Cu + Zn^{2+}$ is 1.10 V at 25°C. The emf of the cell reaction when 0.1 M Cu^{+2} and 0.1 M Zn^{+2} solutions are used at 25°C is

Options :

1. 1.10V
2. 0.11V
3. -1.10V
4. -0.11V

Question Number : 90 Question Id : 67809438346 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which chemical is responsible for permanent hardness of water?

Options :

1. KCl
2. $MgCl_2$
3. NaCl
4. AgCl

Question Number : 91 Question Id : 67809438347 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Permutit is chemically

Options :

1. Sodium Silicate
2. Aluminium Silicate
3. Hydrated Sodium alumino silicate
4. Calicium silicate

Question Number : 92 Question Id : 67809438348 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The cation exchange resin possesses

Options :

1. Acidic group

2. Basic group

3. Amphoteric group

4. Benzo group

Question Number : 93 Question Id : 67809438349 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Chemically the rust is

Options :

1. Fe_2O_3

2. Fe_2O_3. FeO

3. $Fe_2O_3.XH_2O$

4. Fe_2O_3 . NH_3

Question Number : 94 Question Id : 67809438350 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Galvanizing is the process of coating iron with

Options :

1. Mg

2. Cu

3. Au

4. Zn

Question Number : 95 Question Id : 67809438351 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is not a thermoplastic ?

Options :

1. Bakelite

2. Polystyrene

3. Polythene

4. Nylon

Question Number : 96 Question Id : 67809438352 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Isoprene is a monomer of

Options :

1. Starch

2. Cellulose

3. Natural rubber

4. Lignin

Question Number : 97 Question Id : 67809438353 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Buna-S is a copolymer of

Options :

1. Butadiene and Styrene

2. Butadiene and Acrylonitrile

3. Butadiene and Isoprene

4. Formaldehyde and Styrene

Question Number : 98 Question Id : 67809438354 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Main constituent of natural gas is

Options :

1. Ethane

2. Methane

3. Butane

4. Carbon Monoxide

Question Number : 99 Question Id : 67809438355 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Ozone layer is present at

Options :

1. Staratosphere

2. Inosphere

3. Thermosphere

4. Atmosphere

Question Number : 100 Question Id : 67809438356 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The amount of DO required to aerobically decompose biodegradable organic matter of a given volume of water is

Options :

1. Biochemical Oxygen Demand

2. Biological Oxygen Demand

3. Chemical Oxygen demand

4. Biomagnification

Civil Engineering

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

Question Number : 101 Question Id : 67809438357 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A material having the same properties throughout the volume is called

Options :

1. Isotropic

2. Homogeneous

3. Orthotropic

4. Elastic

Question Number : 102 Question Id : 67809438358 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If A_0 is the cross sectional area of the steel specimen undergoing tension test, then the gauge length is equal to

Options :

1. $4.65\sqrt{A_0}$

2. $4.65A_0$

3. $5.65A_0$

4. $5.65\sqrt{A_0}$

Question Number : 103 Question Id : 67809438359 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For the material having Poisson's ratio (μ) equal to zero, the relationship between modulus of Elasticity (E) and bulk modulus (K) is

Options :

1. $E = 2K$

2. $K = 3E$

3. $K = \frac{E}{3}$

4. $E = 3K + 2$

Question Number : 104 Question Id : 67809438360 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A square bar having cross section 10 mm × 10 mm and length 200 mm is subjected to a longitudinal tensile stress of 200 N/mm^2 due to applied load. If the modulus of elasticity and Poison's ratio of the material are 100 GPa and 0.25 respectively, then the volumetric strain is

Options :

1. 0.001

2. 0.01

3. 0.015

4. 0.0015

Question Number : 105 Question Id : 67809438361 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A circular tapering bar of length 400 mm having end diameters 20 mm and 40 mm is subjected to a tensile force of 100π kN. If the modulus of elasticity of the material is 2× 10^5 N/mm^2, then the elongation of bar is

Options :

1. 0.01 mm

2. 0.1 mm

3. 1 mm

4. 10 mm

Question Number : 106 Question Id : 67809438362 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The elongation of bar of length 800 mm and cross section 20 mm × 20 mm is subjected to an axial tensile force is 0.8 mm. If the modulus of elasticity is 1×10^5 N/mm^2, then the stress induced in the bar is

Options :

1. 100 N/mm^2

2. 200 N/mm^2

3. 800 N/mm^2

4. 1000 N/mm^2

Question Number : 107 Question Id : 67809438363 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A bar of cross sectional area A and length L is subjected to axial pull of P induced the tensile stress of σ. If the modulus of elasticity is E, then the strain energy stored in the bar is

Options :

1. $U = \frac{\sigma^2}{4E}.AL$

2. $U = \frac{\sigma^2}{2E}.AL$

3. $U = \frac{\sigma^2}{E}.AL$

4. $U = \frac{\sigma^2}{2AE}.L$

Question Number : 108 Question Id : 67809438364 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An overhang beam ABC of length 8 m is provided with a hinge support at left end A and roller support at B which is 6 m from the support A. It is subjected to a uniformly distributed load of 8 kN/m between the supports A and B and a concentrated load of 72 kN at the free end. The reaction of support A is

Options :

1. 0

2. 36 kN (upward)

3. 36 kN (downward)

4. 72 kN (upward)

Question Number : 109 Question Id : 67809438365 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A cantilever of length 4 m is fixed at A and free at B is subjected to a uniformly distributed load of 24 kN/m over the entire span and a concentrated load of 36 kN at the free end. The maximum bending moment induced in the beam is

Options :

1. 144 kNm

2. 236 kNm

3. 240 kNm

4. 336 kNm

Question Number : 110 Question Id : 67809438366 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A simply supported beam of span L is subjected to two concentrated loads of W each acting at a distance of $\frac{L}{3}$ from either supports. The maximum bending induced in the beam is

Options :

1. WL

2. $\frac{WL}{2}$

3. $\frac{WL}{3}$

4. $\frac{WL}{4}$

Question Number : 111 Question Id : 67809438367 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The section modulus of a beam for a square cross section of side a is

Options :

1. $\frac{a^3}{12}$

2. $\frac{a^3}{6}$

3. $\frac{a^4}{12}$

4. $\frac{a^4}{6}$

Question Number : 112 Question Id : 67809438368 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A beam of span L, cross sectional area A, moment of Inertia I is subjected to a bending moment M induced the bending stress σ. If the modulus of elasticity of the material of the beam is E, then the curvature of the beam is

Options :

1. $\frac{ME}{I}$

2. $\frac{Ey}{\sigma}$

3. $\frac{EI}{M}$

4. $\frac{M}{EI}$

Question Number : 113 Question Id : 67809438369 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

At a section of a rectangular beam of depth 600 mm is subjected to a compressive stress of 80 N/mm^2 at both top and bottom. The position of neutral axis from the bottom is

Options :

1. 240 mm

2. 360 mm

3. 300 mm

4. 400 mm

Question Number : 114 Question Id : 67809438370 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a beam of circular cross section, the ratio of average shear stress to maximum shear stress is

Options :

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

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

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

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

Question Number : 115 Question Id : 67809438371 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

When a shaft is subjected to a torque, the maximum shear stress induced across the cross section at

Options :

1. the centre

2. the extreme fiber

3. middle third

4. one fourth of diameter from the centre

Question Number : 116 Question Id : 67809438372 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A circular shaft of diameter D and length L is subjected to a torque T. If the modulus of rigidity is G and polar moment of Inertia is J, then the angle of twist (θ) of shaft is

Options :

1. $\theta = \frac{GL}{TJ}$

2. $\theta = \frac{TG}{JL}$

3. $\theta = \frac{TL}{GJ}$

4. $\theta = \frac{TD}{GJ}$

Question Number : 117 Question Id : 67809438373 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The torque induced in a shaft to transmit 50 kW power at an angular speed of 150 rpm is

Options :

1. 10 kNm

2. 10π kNm

3. $\frac{10}{\pi}$ kNm

4. $\frac{10,000}{\pi}$ kNm

Question Number : 118 Question Id : 67809438374 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rectangular beam of width 100 mm and depth 200 mm is subjected to a shear force of 100 kN. The maximum shear stress induced in the beam is

Options :

1. 5 N/mm^2

2. 7.5 N/mm^2

3. 10 N/mm^2

4. 15 N/mm^2

Question Number : 119 Question Id : 67809438375 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The moment of resistance of a rectangular beam of width 100 mm and depth 200 mm subjected to the maximum bending stress of 120 N/mm^2 is

Options :

1. 40 kNm

2. 60 kNm

3. 80 kNm

4. 100 kNm

Question Number : 120 Question Id : 67809438376 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The polar modulus of a solid circular shaft of diameter D is

Options :

1. $\frac{\pi D^2}{16}$

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

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

4. $\frac{\pi D^3}{32}$

Question Number : 121 Question Id : 67809438377 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A cantilever beam of length 4 m is subjected to a uniformly distributed load of 24 kN/m over the entire span. If the flexural rigidity is 24000 kNm^2, the deflection at the free end is

Options :

1. 3.2 mm

2. 8 mm

3. 16 mm

4. 32 mm

Question Number : 122 Question Id : 67809438378 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A beam of length L having flexural rigidity EI is subjected to a pure bending moment M bent into a circular arc of radius R. The maximum deflection is given by

Options :

1. $\frac{ML^2}{EI}$

2. $\frac{ML^2}{3EI}$

3. $\frac{L^2}{8R}$

4. $\frac{L^2}{16R}$

Question Number : 123 Question Id : 67809438379 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A simply supported beam AB of span 6 m is subjected to a concentrated load of 48 kN at a distance of 2 m from the left end A. The maximum slope occurs

Options :

1. at left support

2. at Right support

3. at mid span

4. under the concentrated load

Question Number : 124 Question Id : 67809438380 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the depth of a simply supported rectangular beam subjected to concentrated load at mid span is doubled, the maximum deflection at the mid span will be

Options :

1. increased by 12.5%

2. decreased by 12.5%

3. decreased by 87.5%

4. decreased by 50%

Question Number : 125 Question Id : 67809438381 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a simply supported beam subjected to transverse loading, the maximum deflection occurs at

Options :

1. the point where slope is equal to zero

2. the point of maximum bending moment

3. the point of contraflexure

4. the point where slope is maximum

Question Number : 126 Question Id : 67809438382 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A fixed beam of span L is subjected to a uniformly distributed load of w per m length throughout the span. The bending moment at mid span of the beam is

Options :

1. $\frac{wL^2}{24}$

2. $\frac{wL^2}{16}$

3. $\frac{wL^2}{12}$

4. $\frac{wL^2}{8}$

Question Number : 127 Question Id : 67809438383 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A propped cantilever AB of span 6 m is fixed at A and supported by a prop at B is subjected to a uniformly distributed load of 24 kN/m over the entire span. The reaction of the prop is

Options :

1. 48 kN

2. 54 kN

3. 72 kN

4. 90 kN

Question Number : 128 Question Id : 67809438384 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A two span continuous beam supported at A, B and C each of length L is subjected to a uniformly distributed load of w per m through the length. The reaction of the middle support B is

Options :

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

2. $\frac{4}{5}wL$

3. wL

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

Question Number : 129 Question Id : 67809438385 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A propped cantilever beam AB of span L is fixed at A and supported by a prop at B is subjected to a concentrated load of W at mid span C. The point of contraflexure occurs

Options :

1. under the concentrated load

2. between A and C

3. between B and C

4. at the fixed end A

Question Number : 130 Question Id : 67809438386 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Euler's buckling load for a long column of length L and flexural rigidity EI fixed at the base and hinged at the top, is

Options :

1. $\frac{\pi^2 EI}{4L^2}$

2. $\frac{\pi^2 EI}{L^2}$

3. $\frac{2\pi^2 EI}{L^2}$

4. $\frac{4\pi^2 EI}{L^2}$

Question Number : 131 Question Id : 67809438387 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The radius of gyration of solid circular column of diameter D is

Options :

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

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

3. $\frac{D}{3}$

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

Question Number : 132 Question Id : 67809438388 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the diameter of the long circular column is increased by 10%, the percentage increase in Euler's buckling load for the same condition is

Options :

1. 10

2. 20

3. 46.41

4. 53.59

Question Number : 133 Question Id : 67809438389 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A steel column of length L fixed at both the ends has a buckling load of 400 kN. If the same column is fixed at bottom and free at top, the buckling load carrying capacity is

Options :

1. 400 kN

2. 282.8 kN

3. 200 kN

4. 100 kN

Question Number : 134 Question Id : 67809438390 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The ratio of effective length of a column to its least radius of gyration is known as

Options :

1. buckling factor

2. crippling factor

3. slenderness ratio

4. column factor

Question Number : 135 Question Id : 67809438391 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a pin jointed plane truss having 3 reaction components at supports and 8 joints, the minimum number of members to be arranged systematically for the stable condition is

Options :

1. 13

2. 12

3. 11

4. 8

Question Number : 136 Question Id : 67809438392 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The forces induced in the members of a pin jointed truss subjected to loading at the joints are

Options :

1. Axial forces only

2. Bending moment only

3. Axial force and bending moment

4. Axial force, shear force and bending moment.

Question Number : 137 Question Id : 67809438393 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If ϕ: Angle of repose of soil, the coefficient of active earth pressure is

Options :

1. $\left(\frac{1-\sin\phi}{1+\sin\phi}\right)^2$

2. $\left(\frac{1+\sin\phi}{1-\sin\phi}\right)^2$

3. $\frac{1-\sin\phi}{1+\sin\phi}$

4. $\frac{1+\sin\phi}{1-\sin\phi}$

Question Number : 138 Question Id : 67809438394 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A dam of height h and base width b having a self weight of W per unit length of dam is used for storing water. If the resultant of all forces acting on the dam strikes the base at an eccentricity of $\frac{b}{6}$, the maximum compressive stress induced at the toe is

Options :

1. $\frac{W}{h}$

2. $\frac{2W}{h}$

3. $\frac{W}{b}$

4. $\frac{2W}{b}$

Question Number : 139 Question Id : 67809438395 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A retaining wall of height 4 m retains the soil horizontal to the top. Angle of repose of soil is 30° and unit weight of soil is 18 kN/m^3. The intensity of active earth pressure at the base is

Options :

1. 24 kN/m^2

2. 36 kN/m^2

3. 48 kN/m^2

4. 72 kN/m^2

Question Number : 140 Question Id : 67809438396 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For the same span and cross section, the ratio of mid span deflection of a simply supported beam to that of a fixed beam subjected to a uniformly distributed load of w per m run throughout, is

Options :

1. 4

2. 5

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

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

Question Number : 141 Question Id : 67809438397 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Characteristic strength of concrete is defined as that compressive strength

Options :

1. below which not less than 5% of the test results expected to fall

2. below which not more than 5% of the test results expected to fall

3. above which not more than 5% of the test results expected fall

4. above which not more than 10% of the test results expected to fall

Question Number : 142 Question Id : 67809438398 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As per IS: 456-2000, the modulus of elasticity for M 25 grade of concrete in N/mm^2 is

Options :

1. 36,000

2. 28,500

3. 25,000

4. 3,000

Question Number : 143 Question Id : 67809438399 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As per IS:456-2000, for the limit state design of a flexural member, the strain in reinforcing bars under tension at ultimate state should not be less than

Options :

1. $\frac{f_y}{1.15E_s}+0.0035$

2. $\frac{f_y}{1.15E_s}+0.002$

3. $\frac{f_y}{E_s}+0.0035$

4. $\frac{f_y}{E_s}+0.002$

Question Number : 144 Question Id : 67809438400 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If f_{ck} is the characteristic compressive strength of concrete, the stress in concrete at collapse in flexure as per IS: 456-2000 is

Options :

1. $0.138 f_{ck}$

2. $0.446 f_{ck}$

3. $0.576 f_{ck}$

4. $0.67 f_{ck}$

Question Number : 145 Question Id : 67809438401 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For M 25 grade of concrete, the ratio of flexural strength to the characteristic compressive strength of concrete is

Options :

1. 0.36

2. 0.17

3. 0.14

4. 0.11

Question Number : 146 Question Id : 67809438402 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Grade of steel is designated as Fe 500, if the

Options :

1. lower yield stress of steel is 500 N/mm^2

2. upper yield stress of steel is 500 N/mm^2

3. ultimate stress of steel is 500 N/mm^2

4. the characteristic tensile strength is 500 N/mm^2

Question Number : 147 Question Id : 67809438403 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a reinforced concrete beam design, the distance of the centroid of the area of tension reinforcement from the extreme compression fiber is known as

Options :

1. depth of neutral axis

2. lever arm

3. effective depth

4. overall depth

Question Number : 148 Question Id : 67809438404 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The minimum percentage area of tension reinforcement in a beam shall be greater than

Options :

1. $\frac{85}{f_y}$

2. $\frac{0.85}{f_y}$

3. $\frac{0.4}{f_y}$

4. $\frac{40}{f_y}$

Question Number : 149 Question Id : 67809438405 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The main reinforcement to be provided for a cantilever beam carrying gravity load is

Options :

1. at the neutral axis

2. above the neutral axis

3. below the neutral axis

4. in the form of vertical stirrups

Question Number : 150 Question Id : 67809438406 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As per IS 456:2000,in a reinforced concrete beam, the permissible shear stress depends on

Options :

1. shear reinforcement in the beam

2. compression reinforcement in the beam

3. tension reinforcement in the beam

4. the reinforcement at neutral axis

Question Number : 151 Question Id : 67809438407 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The computation of limiting deflection of the two way slab as per IS 456:2000 is dependent on

Options :

1. Both short and long spans

2. long span

3. short span

4. Not dependent on both short and long spans

Question Number : 152 Question Id : 67809438408 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As per IS:456:2000, the clear cover to the main steel bar in column is

Options :

1. 40 mm

2. 25 mm

3. 20 mm

4. 15 mm

Question Number : 153 Question Id : 67809438409 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The minimum eccentricity for a column of size 300 mm × 300 mm and unsupported length of 3.0 m as per IS:456 is

Options :

1. 6 mm

2. 10 mm

3. 16 mm

4. 20 mm

Question Number : 154 Question Id : 67809438410 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The maximum size of reinforcement that can be used for a reinforced concrete slab of 75 mm thick is

Options :

1. 6 mm

2. 8 mm

3. 10 mm

4. 12 mm

Question Number : 155 Question Id : 67809438411 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For the design of footing, the critical section for two way shear is at

Options :

1. the face of the column

2. a distance of $\frac{d}{2}$ from the face of the column

3. a distance of d from the face of the column

4. a distance of $2d$ from the face of the column

Question Number : 156 Question Id : 67809438412 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The live load to be considered in the design of staircase for public building liable for overcrowding is

Options :

1. 2 kN/m^2

2. 2.5 kN/m^2

3. 4 kN/m^2

4. 5 kN/m^2

Question Number : 157 Question Id : 67809438413 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In working stress method of design, the moment carrying capacity of an under reinforced rectangular RCC beam is

Options :

1. Rbd^2

2. $\sigma_{St}.A_{st}.\left(d-\frac{x}{3}\right)$

3. $\frac{1}{2}.\sigma_{cbc}.b.x\left(d-\frac{x}{3}\right)$

4. $\sigma_{St}.A_{st}.jd$

Question Number : 158 Question Id : 67809438414 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a given RC beam, the critical depth for neutral axis depends on

Options :

1. the permissible tensile stress in steel reinforcement (σ_{st})

2. the permissible stress in concrete in bending compression (σ_{cbc})

3. the modular ratio (m)

4. σ_{St}, σ_{cbc} and m

Question Number : 159 Question Id : 67809438415 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For a given size of RC beam, as the percentage of steel reinforcement increases, the depth of neutral axis

Options :

1. remains unchanged

2. increases

3. decreases

4. first decreases and then increases

Question Number : 160 Question Id : 67809438416 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In working stress method of design, the depth of neutral axis for a singly reinforced beam of width 230 mm and effective depth 400 mm is 180 mm. The lever arm for the section is

Options :

1. 200 mm

2. 310 mm

3. 340 mm

4. 360 mm

Question Number : 161 Question Id : 67809438417 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A 30 m chain is found to be 0.1 m too short throughout the measurement of a line AB and recorded as 300 m. The actual length of the line AB is

Options :

1. 299.0 m

2. 300.1 m

3. 301.0 m

4. 310.0 m

Question Number : 162 Question Id : 67809438418 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The side of a square land was measured as 300 m and is in error by 0.05 m. The error in computing the area of land is

Options :

1. 40 m^2

2. 30 m^2

3. 20 m^2

4. 10 m^2

Question Number : 163 Question Id : 67809438419 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a closed traverse, the sum of north latitudes exceeds the sum of south latitudes and the sum of the west departures exceeds the sum of east departures. The closing line will be in the

Options :

1. North-East quadrant

2. North-West quadrant

3. South-East quadrant

4. South-West quadrant

Question Number : 164 Question Id : 67809438420 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A line AB in an old map has magnetic bearing of $45^0 30'$ when local magnetic declination was $2^0 30'$ east. If the magnetic declination is now is $2^0 00'$ west, then the magnetic bearing of the line AB now is

Options :

1. $50^0 00'$

2. $46^0 00'$

3. $45^0 00'$

4. $41^0 00'$

Question Number : 165 Question Id : 67809438421 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The following bearings were observed while traversing with a compass

Line	FB	BB
AB	$225^0 30'$	$45^0 15'$
BC	$315^0 45'$	$135^0 45'$
CD	$45^0 45'$	$225^0 45'$
DA	$135^0 0'$	$45^0 0'$

The station affected by local attraction is

Options :

1. A

2. B

3. C

4. D

Question Number : 166 Question Id : 67809438422 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The sensitivity of a bubble tube can be increased by

Options :

1. using a liquid of greater surface tension

2. decreasing the diameter of the tube

3. decreasing the length of the tube

4. increasing the length of the tube

Question Number : 167 Question Id : 67809438423 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In a leveling survey, the summation of all back sights and the summation of all fore sights are 8.675 m and 8.595 m respectively. The reduced level of the initial bench make is 100.000 m. The reduced level of the last point where the staff is held will be

Options :

1. 108.675 m

2. 108.595 m

3. 100.080 m

4. 99.920 m

Question Number : 168 Question Id : 67809438424 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Which of the following is correct about the characteristics of contours?

Options :

1. closed contour lines with higher values inside indicate pond

2. closely spaced contours indicate plain area

3. contour lines intersect each other at right angles

4. contour lines always form closed circuit within or outside the limits of the map

Question Number : 169 Question Id : 67809438425 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Remote sensing technique makes use of the properties of

Options :

1. Electric waves

2. Sound waves

3. Wind waves

4. Electromagnetic waves

Question Number : 170 Question Id : 67809438426 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The most widely used antenna in Global Positioning System (GPS) is

Options :

1. Microstrip antenna

2. Parabolic antenna

3. Horn antenna

4. Slotted antenna

Question Number : 171 Question Id : 67809438427 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The data associated with Geographical Information System (GIS) is

Options :

1. Binary data

2. Spatial data

3. Numeric data

4. Complex data

Question Number : 172 Question Id : 67809438428 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An imaginary line joining the point of intersection of the cross hairs of the diaphragm and an optical centre of object glass and its continuation is called as

Options :

1. Line of collimation

2. Axis of the telescope

3. Horizontal axis

4. Turnion axis

Question Number : 173 Question Id : 67809438429 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Turning of the theodolite telescope in vertical plane by 180° about the horizontal axis is known as

Options :

1. swinging

2. transiting

3. centering

4. setting

Question Number : 174 Question Id : 67809438430 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The length and fore bearing of a line AB are 100 m and 30° respectively. The latitude and departure of line AB respectively are

Options :

1. 86.6 m and 86.6 m

2. 50 m and 50 m

3. 50 m and 86.6 m

4. 86.6 m and 50 m

Question Number : 175 Question Id : 67809438431 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In stadia Tachometer, the ratio of focal length of objective to the stadia intercept is known as

Options :

1. Multiplicative constant

2. Additive constant

3. Stadia constant

4. Intercept constant

Question Number : 176 Question Id : 67809438432 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The dimension of surface tension is

Options :

1. J/m

2. J/m^2

3. W/m

4. N/m^2

Question Number : 177 Question Id : 67809438433 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The pressure at a point in water column is 4 N/cm^2. If the unit weight of water is 10 kN/m^3, the corresponding height of water is

Options :

1. 2 m

2. 4 m

3. 6 m

4. 8 m

Question Number : 178 Question Id : 67809438434 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A streamline is a line

Options :

1. which is along path of the particle

2. which is always parallel to the main direction of flow

3. along which there is no flow

4. on which tangent drawn at any point gives the direction of velocity

Question Number : 179 Question Id : 67809438435 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The stream function is given by $\psi = 2xy$, then the velocity at the point $(4,3)$ is

Options :

1. 6

2. 8

3. 9

4. 10

Question Number : 180 Question Id : 67809438436 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The piezometric head is the summation of

Options :

1. velocity head and pressure head

2. pressure head and elevation head

3. elevation head and velocity head

4. velocity head, pressure head and elevation head

Question Number : 181 Question Id : 67809438437 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Bernoulli's equation is applicable between any two points located in

Options :

1. Rotational flow of an incompressible fluid

2. Irrotational flow of a compressible or incompressible fluid

3. Steady, rotational flow of an incompressible fluid

4. Steady, irrotational flow of an incompressible fluid

Question Number : 182 Question Id : 67809438438 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rectangular plate of width b and height h is immersed vertically in water such that the top edge is at the surface of the liquid. The centre of pressure is at a depth of

Options :

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

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

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

4. $\frac{2}{3}h$

Question Number : 183 Question Id : 67809438439 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The relation between the coefficient of discharge C_d, coefficient of velocity C_v and coefficient of contraction C_c for an orifice is given by

Options :

1. $C_v = C_c C_d$

2. $C_c = C_v C_d$

3. $C_d = C_c C_v$

4. $C_c C_v C_d = 1$

Question Number : 184 Question Id : 67809438440 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For laminar flow through a circular pipe, the shear stress

Options :

1. Remains constant over the cross-section

2. Varies linearly with the radial distance

3. Must be zero at all the points

4. Varies parabolically with the radial distance

Question Number : 185 Question Id : 67809438441 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The friction factor for laminar flow through pipe in terms of Reynolds number (R_e) is

Options :

1. $\frac{64}{R_e}$

2. $\frac{R_e}{64}$

3. $64 R_e$

4. $\frac{0.316}{R_e^{1/4}}$

Question Number : 186 Question Id : 67809438442 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The best hydraulic channel cross-section is defined as the section

Options :

1. with minimum roughness coefficient

2. that has a maximum area of a given flow

3. that has a minimum wetted perimeter

4. that has maximum wetted area

Question Number : 187 Question Id : 67809438443 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For an open channel with cross sectional area A and wetted perimeter P, the hydraulic mean depth R is given by

Options :

1. $\frac{P}{A}$

2. $\frac{A}{P}$

3. $\sqrt{\frac{A}{P}}$

4. $\sqrt{\frac{P}{A}}$

Question Number : 188 Question Id : 67809438444 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the error in measurement of height of water surface above the crest of a rectangular notch is 2%, then the percentage error in computing the discharge is

Options :

1. 2%

2. 3%

3. 4%

4. 6%

Question Number : 189 Question Id : 67809438445 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The specific speed of a pump is defined as the unit of such a size that it

Options :

1. Delivers unit discharge at unit head

2. Requires unit power to develop unit head

3. Delivers unit discharge at unit power

4. Produces unit power with unit head available

Question Number : 190 Question Id : 67809438446 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The specific speed of a hydraulic turbine depends on

Options :

1. speed and power developed only

2. speed and water head only

3. discharge and power developed only

4. speed, head and power developed

Question Number : 191 Question Id : 67809438447 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

According to Dicken's formula, the peak flood discharge for the catchment area A (in sq.m) is proportional to

Options :

1. A

2. $A^{1/2}$

3. $A^{2/3}$

4. $A^{3/4}$

Question Number : 192 Question Id : 67809438448 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Duty of irrigation water is large

Options :

1. at the head of main canal

2. at the head of branch canal

3. at the head of water course

4. on the field

Question Number : 193 Question Id : 67809438449 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Hydrograph is the graph drawn between

Options :

1. Runoff and time

2. Base flow and Time

3. Ground water and time

4. Rainfall and time

Question Number : 194 Question Id : 67809438450 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The water stored in the reservoir below the minimum pool level is

Options :

1. Useful storage

2. Valley storage

3. Dead storage

4. Surcharge storage

Question Number : 195 Question Id : 67809438451 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A solid construction put across the river to raise its water level and divert the water into canal is

Options :

1. Marginal bund

2. Barrage

3. Weir

4. Dam

Question Number : 196 Question Id : 67809438452 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The Non-recording type rain gauge is

Options :

1. Tipping bucket type rain gauge

2. Simon's rain gauge

3. Weighing type rain gauge

4. Floating type rain gauge

Question Number : 197 Question Id : 67809438453 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If m is the mean particle diameter of silt in mm, the Lacey's silt factor (f) is given by

Options :

1. $f = 1.76\ m^{1/2}$

2. $f = 1.76\ m^{2}$

3. $f = 1.76\ m^{3/2}$

4. $f = 1.76\ m^{5/2}$

Question Number : 198 Question Id : 67809438454 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

For the upstream face of an earthen dam, the most adverse condition for stability of slope is

Options :

1. sloughing of slope

2. during construction

3. steady seepage

4. sudden drawdown

Question Number : 199 Question Id : 67809438455 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

If the R.L's of canal bed level and high flood level of drainage are 212.0 m and 210.0 m respectively, then the suitable cross drainage work will be

Options :

1. super passage

2. Aqueduct

3. Level crossing

4. Canal siphon

Question Number : 200 Question Id : 67809438456 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The method of irrigation used for Orchard's is

Options :

1. Border flooding

2. Free flood

3. Basin flooding

4. Check flooding

APECET 2019 FINAL KEY
Subject: CIVIL ENGINEERING

Q.No.	Answer	Q.No.	Answer	Q.No.	Answer	Q.No.	Answer
1	3	51	3	101	2	151	3
2	1	52	4	102	4	152	1
3	4	53	4	103	3	153	4
4	1	54	2	104	1	154	2
5	3	55	3	105	3	155	2
6	2	56	4	106	1	156	4
7	4	57	1	107	2	157	2
8	1	58	1	108	1	158	1
9	*	59	4	109	4	159	2
10	3	60	1	110	3	160	3
11	2	61	1	111	2	161	1
12	4	62	2	112	4	162	2
13	2	63	1	113	3	163	3
14	4	64	3	114	4	164	1
15	1	65	3	115	2	165	1
16	3	66	1	116	3	166	4
17	4	67	3	117	3	167	3
18	1	68	4	118	2	168	4
19	1	69	2	119	3	169	4
20	*	70	2	120	3	170	1
21	3	71	1	121	4	171	2
22	1	72	3	122	3	172	1
23	*	73	2	123	1	173	2
24	4	74	4	124	3	174	4
25	3	75	4	125	1	175	1
26	1	76	3	126	1	176	2
27	1	77	4	127	2	177	2
28	*	78	3	128	4	178	4
29	3	79	3	129	2	179	4
30	1	80	1	130	3	180	2
31	1	81	2	131	2	181	4
32	3	82	2	132	3	182	4
33	4	83	3	133	*	183	3
34	1	84	2	134	3	184	2
35	4	85	1	135	1	185	1
36	3	86	2	136	1	186	3
37	1	87	3	137	3	187	2
38	1	88	2	138	4	188	2
39	2	89	1	139	1	189	1
40	4	90	2	140	2	190	4
41	1	91	3	141	2	191	4
42	4	92	1	142	3	192	4
43	1	93	3	143	2	193	1
44	3	94	4	144	2	194	3
45	1	95	1	145	3	195	3
46	1	96	3	146	4	196	2
47	1	97	1	147	3	197	1
48	2	98	2	148	1	198	4
49	1	99	1	149	2	199	2
50	1	100	2	150	3	200	3

***Indicates that there is no correct option. All students will be given marks.**