

# Question Paper Preview

## Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✖ icon are incorrect.

<b>Question Paper Name :</b>	Civil Engineering 31st Aug 2020 Shift 2
<b>Subject Name :</b>	Civil Engineering
<b>Creation Date :</b>	2020-09-01 11:53:56
<b>Duration :</b>	180
<b>Total Marks :</b>	200
<b>Display Marks:</b>	No
<b>Share Answer Key With Delivery Engine :</b>	Yes
<b>Actual Answer Key :</b>	Yes
<b>Calculator :</b>	None
<b>Magnifying Glass Required? :</b>	No
<b>Ruler Required? :</b>	No
<b>Eraser Required? :</b>	No
<b>Scratch Pad Required? :</b>	No
<b>Rough Sketch/Notepad Required? :</b>	No
<b>Protractor Required? :</b>	No
<b>Show Watermark on Console? :</b>	Yes
<b>Highlighter :</b>	No
<b>Auto Save on Console? :</b>	Yes

## Civil Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	76439054
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	180
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	200
<b>Is this Group for Examiner? :</b>	No

## Mathematics

<b>Section Id :</b>	764390207
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	50
<b>Number of Questions to be attempted :</b>	50
<b>Section Marks :</b>	50
<b>Display Number Panel :</b>	Yes
<b>Group All Questions :</b>	Yes
<b>Mark As Answered Required? :</b>	Yes

Sub-Section Number : 1  
Sub-Section Id : 764390237  
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 76439010625 Question Type : MCQ Option Shuffling : Yes Display Question Number :  
Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Let A, B be two distinct square matrices of same order such that  $AB=A$ ,  $BA=B$ , then

Options :

76439042401. ✓  $A^2 = A, B^2 = B$

76439042402. ✗  $A^2 = A, B^2 \neq B$

76439042403. ✗  $A^2 \neq A, B^2 = B$

76439042404. ✗  $A^2 \neq A, B^2 \neq B$

Question Number : 2 Question Id : 76439010626 Question Type : MCQ Option Shuffling : Yes Display Question Number :  
Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which of the following statements is not correct?

Options :

76439042405. ✗ Every square matrix can be expressed as a sum of a symmetric and a skew-symmetric matrices.

76439042406. ✗ If A is non singular matrix , then so is adj A

76439042407. ✗ If A , B , C are nxn matrices , then  $(AB)C=A(BC)$

76439042408. ✓ Let O denote the nxn null matrix. If A,B are nxn matrices and  $AB=O$ , then  $A=O$  or  $B=O$

Question Number : 3 Question Id : 76439010627 Question Type : MCQ Option Shuffling : Yes Display Question Number :  
Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If A is a square matrix of order 4, then  $|\text{adj}(\text{adj}A^2)| =$

Options :

76439042409. ✖  $|A|^3$

76439042410. ✖  $|A|^6$

76439042411. ✖  $|A|^{27}$

76439042412. ✔  $|A|^{18}$

Question Number : 4 Question Id : 76439010628 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the system of equations  $x = cy + bz, y = az + cx, z = bx + ay$  has a non-zero solution,

then  $a^2 + b^2 + c^2 + 2abc =$

Options :

76439042413. ✖ 0

76439042414. ✖ 2

76439042415. ✔ 1

76439042416. ✖ 3

Question Number : 5 Question Id : 76439010629 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $\frac{x^2+x+1}{x^2+2x+1} = A + \frac{B}{x+1} + \frac{C}{(x+1)^2}$ , then  $(A,B,C) =$

Options :

76439042417. ✔ (1,-1,1)

76439042418. ✖ (1,-1,-1)

76439042419. ✖ (-1,1,-1)

76439042420. ✖ (-1,-1,-1)

Question Number : 6 Question Id : 76439010630 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $x, y, z$  are three distinct positive real numbers and  $\frac{\log x}{y-z} = \frac{\log y}{z-x} = \frac{\log z}{x-y}$ , then  $xyz =$

Options :

76439042421. ✖ 0

76439042422. ✔ 1

76439042423. ✖ 2

76439042424. ✖ 3

Question Number : 7 Question Id : 76439010631 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In  $\triangle ABC$ , if  $\cot \frac{A}{2} = \frac{b+c}{a}$ , then  $\angle A + \angle C =$

Options :

76439042425. ✖  $60^\circ$

76439042426. ✔  $90^\circ$

76439042427. ✖  $120^\circ$

76439042428. ✖  $150^\circ$

Question Number : 8 Question Id : 76439010632 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In  $\triangle ABC$ , if  $\cot \frac{A}{2} : \cot \frac{B}{2} : \cot \frac{C}{2} = 3 : 5 : 7$ , then  $a : b : c =$

Options :

76439042429. ✖ 5:4:6

76439042430. ✔ 6:5:4

76439042431. ✖ 4:6:5

76439042432. ✖ 12:5:4

Question Number : 9 Question Id : 76439010633 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $A-B = \frac{3\pi}{4}$ , then  $(1-\tan A)(1+\tan B) =$

Options :

76439042433. ✖ 0

76439042434. ✖ 1

76439042435. ✔ 2

76439042436. ✖ 3

Question Number : 10 Question Id : 76439010634 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$\sqrt{3} \csc 20^\circ - \sec 20^\circ =$

Options :

76439042437. ✖ 1

76439042438. ✖ 2

76439042439. ✖ 3

76439042440. ✔ 4

Question Number : 11 Question Id : 76439010635 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$\cos A \cos 2A \cos 4A \cos 8A =$

Options :

76439042441. ✔  $\frac{\sin 16A}{16 \sin A}$

76439042442. ✖  $\frac{\sin 32A}{32 \sin A}$

76439042443. ✖  $\frac{\sin 48A}{48 \sin A}$

76439042444. ✖  $\frac{\sin 64A}{64 \sin A}$

Question Number : 12 Question Id : 76439010636 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The general solution set of  $\sin 2x + \sin 4x = 2 \sin 3x$  is

Options :

76439042445. ✔  $\left\{ \frac{n\pi}{3} / n \in \mathbb{Z} \right\}$

76439042446. ✖  $\{2n\pi / n \in \mathbb{Z}\}$

76439042447. ✖  $\{n\pi / n \in \mathbb{Z}\}$

76439042448. ✖  $\left\{ \frac{n\pi}{3} + 2n\pi / n \in \mathbb{Z} \right\}$

Question Number : 13 Question Id : 76439010637 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $x, y, z$  have same sign such that  $xy + yz + zx < 1$  and  $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$ ,

then  $\frac{1}{xy} + \frac{1}{yz} + \frac{1}{zx} =$

Options :

76439042449. ✖  $\frac{1}{xyz}$

76439042450. ✔ 1

76439042451. ✖  $xyz$

76439042452. ✖  $\frac{1}{x^2y^2z^2}$

Question Number : 14 Question Id : 76439010638 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $\sinh x = 5$ , then  $e^x =$

Options :

76439042453. ✖  $5 - \sqrt{26}$

76439042454. ✔  $5 + \sqrt{26}$

76439042455. ✖  $5 \pm \sqrt{26}$

76439042456. ✖  $\sqrt{26} - 5$

Question Number : 15 Question Id : 76439010639 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $\alpha$  and  $\beta$  are two distinct complex numbers such that  $\left| \frac{\beta - \alpha}{1 - \bar{\alpha}\beta} \right| = 1$ , then

Options :

76439042457. ✖  $|\alpha| = 1$

76439042458. ✖  $|\beta| = 1$

76439042459. ✔  $|\alpha| = 1$  or  $|\beta| = 1$

76439042460. ✖  $|\alpha| = 1$  and  $|\beta| = 1$

Question Number : 16 Question Id : 76439010640 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $\left(\frac{1+\sin\theta+i\cos\theta}{1+\sin\theta-i\cos\theta}\right)^n = \cos k\theta + i \sin k\theta$ , then  $k =$

Options :

76439042461. ✖  $\frac{n\pi}{2} - \theta$

76439042462. ✖  $\frac{n\pi}{2} - n\theta$

76439042463. ✖  $n\pi - n\theta$

76439042464. ✔  $\frac{1}{2\theta}(n\pi - 2n\theta)$

Question Number : 17 Question Id : 76439010641 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If the perpendicular distance of the straight line  $\frac{x}{a} + \frac{y}{b} = 1, a > 0, b > 0$  from the origin is  $p$

then

Options :

76439042465. ✖  $\frac{1}{p^2} = \frac{1}{a^2} - \frac{1}{b^2}$

76439042466. ✖  $p^2 = b^2 - a^2$

76439042467. ✔  $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

76439042468. ✖  $p^2 = a^2 + b^2$

Question Number : 18 Question Id : 76439010642 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The line  $lx + my + n = 0$  is a normal to the circle  $x^2 + y^2 - 4x - 6y + 11 = 0$  if

Options :

76439042469. ✔  $2l + 3m + n = 0$



76439042470. ✖  $2l + 3m - n = 0$

76439042471. ✖  $2l - 3m - n = 0$

76439042472. ✖  $2l - 3m + n = 0$

**Question Number : 19 Question Id : 76439010643 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The centre of the circle passing through origin and (0,4) & (4,0) is

**Options :**

76439042473. ✖ (4,4)

76439042474. ✖ (4,2)

76439042475. ✖ (2,4)

76439042476. ✔ (2,2)

**Question Number : 20 Question Id : 76439010644 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{e^{\cos x} - 1}{x - \frac{\pi}{2}} =$$

**Options :**

76439042477. ✖ 0

76439042478. ✖ 1

76439042479. ✔ -1

76439042480. ✖  $\pi/2$

**Question Number : 21 Question Id : 76439010645 Question Type : MCQ Option Shuffling : Yes Display Question Number**

: Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The derivative of  $\log_a x$ , with respect to  $a^x$  is

Options :

76439042481. ✖ 1

76439042482. ✖  $xa^x$

76439042483. ✔  $\frac{1}{xa^x(\log a)^2}$

76439042484. ✖  $\frac{1}{xa^x}$

Question Number : 22 Question Id : 76439010646 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

If  $y = x + \tan x$ , then  $\cos^2 x \frac{d^2 y}{dx^2} + 2x =$

Options :

76439042485. ✖  $2y'$

76439042486. ✔  $2y$

76439042487. ✖  $y'$

76439042488. ✖  $y$

Question Number : 23 Question Id : 76439010647 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The set of all points at which the curve  $y = \sin x$  has horizontal tangents are

Options :

76439042489. ✔  $\left( (2n+1)\frac{\pi}{2}, (-1)^n \right) n \in \mathbb{Z}$

76439042490. ✖  $(n\pi, (-1)^n) \quad n \in \mathbb{Z}$

76439042491. ✖  $(n\frac{\pi}{2}, (-1)^n) \quad n \in \mathbb{Z}$

76439042492. ✖  $((2n+1)\pi, (-1)^n) \quad n \in \mathbb{Z}$

Question Number : 24 Question Id : 76439010648 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The interval in which  $f(x) = x^x, (x > 0)$  is increasing is

Options :

76439042493. ✖  $(0, \frac{1}{e})$

76439042494. ✖  $(0, e)$

76439042495. ✖  $(e, \infty)$

76439042496. ✔  $(\frac{1}{e}, \infty)$

Question Number : 25 Question Id : 76439010649 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The extreme values of  $f(x) = 4x - \frac{x^2}{2}$  on  $[-2, \frac{9}{2}]$  are

Options :

76439042497. ✔ absolute minimum = -10; absolute maximum = 8

76439042498. ✖ absolute minimum = 8; absolute maximum = 12

76439042499. ✖ absolute minimum = -10; absolute maximum = 12

76439042500. ✖ absolute minimum = -2; absolute maximum = 9/2

Question Number : 26 Question Id : 76439010650 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $\sin u = \frac{x+y}{\sqrt{x}+\sqrt{y}}$ , then  $2\left(x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y}\right)\cos u =$

Options :

76439042501. ✔  $\sin u$

76439042502. ✖  $\frac{1}{2}\sin u$

76439042503. ✖  $\tan u$

76439042504. ✖  $\sin 2u$

Question Number : 27 Question Id : 76439010651 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$\int \frac{\sin 2x}{(\sin 5x)(\sin 3x)} dx =$

Options :

76439042505. ✖  $\log|\sin 3x| - \log|\sin 5x| + C$

76439042506. ✖  $\frac{1}{3}\log|\sin 3x| + \frac{1}{5}\log|\sin 5x| + C$

76439042507. ✔  $\frac{1}{3}\log|\sin 3x| - \frac{1}{5}\log|\sin 5x| + C$

$$3 \log |\sin 3x| - 5 \log |\sin 5x| + C$$

76439042508. ✖

Question Number : 28 Question Id : 76439010652 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\int x(\sin x)(\sec^3 x) dx =$$

Options :

$$\frac{1}{2} [\sec^2 x - \tan x] + C$$

76439042509. ✖

$$\frac{1}{2} [x \sec^2 x - \tan x] + C$$

76439042510. ✔

$$\frac{1}{2} [x \sec^2 x + \tan x] + C$$

76439042511. ✖

$$\frac{1}{2} [\sec^2 x + \tan x] + C$$

76439042512. ✖

Question Number : 29 Question Id : 76439010653 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\int \sqrt{e^x - 1} dx =$$

Options :

$$2[\sqrt{e^x - 1} - \tan^{-1} \sqrt{e^x - 1}] + C$$

76439042513. ✔

$$\sqrt{e^x - 1} - \tan^{-1} \sqrt{e^x - 1} + C$$

76439042514. ✖

$$\sqrt{e^x - 1} + \tan^{-1} \sqrt{e^x - 1} + C$$

76439042515. ✖

$$2[\sqrt{e^x - 1} + \tan^{-1}\sqrt{e^x - 1}] + C$$

76439042516. ✖

Question Number : 30 Question Id : 76439010654 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$$\int \frac{\ln(\tan x)}{\sin x \cos x} dx =$$

Options :

76439042517. ✖  $\frac{1}{2} \ln(\tan x) + C$

76439042518. ✖  $\frac{1}{2} \ln(\tan^2 x) + C$

76439042519. ✔  $\frac{1}{2} [\ln(\tan x)]^2 + C$

76439042520. ✖ 0

Question Number : 31 Question Id : 76439010655 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The area of the region ( in square units) bounded by the parabola  $y = x^2 + 1$  and the straight-line  $x + y = 3$  is

Options :

76439042521. ✔  $\frac{9}{2}$

76439042522. ✖ 3

76439042523. ✖  $\frac{9}{4}$

76439042524. ✖ 0

Question Number : 32 Question Id : 76439010656 Question Type : MCQ Option Shuffling : Yes Display Question Number

: Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The values of a function  $f$  at different points are given in the following table.

$x$	-4	-3	-2	-1	0	1	2
$f(x)$	0	4	5	3	10	11	2

The approximate value of  $\int_{-4}^2 f(x)dx$  is

Options :

76439042525. ✖ 32

76439042526. ✔ 34

76439042527. ✖ 26

76439042528. ✖ 40

Question Number : 33 Question Id : 76439010657 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

The degree of the differential equation  $(1+x^2) \left(\frac{dy}{dx}\right)^2 - 2xy \frac{dy}{dx} + (1+y^2) = 0$  is

Options :

76439042529. ✖ 1

76439042530. ✔ 2

76439042531. ✖ 3

76439042532. ✖ 0

Question Number : 34 Question Id : 76439010658 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Solution of  $\frac{dy}{dx} + \frac{1+y^2}{1+x^2} = 0$  is

Options :

$$\sin^{-1} x + \sin^{-1} y = C$$

76439042533. ✖

$$\tan^{-1} x - \tan^{-1} y = C$$

76439042534. ✖

$$\tan^{-1} x + \tan^{-1} y = C$$

76439042535. ✔

$$\sin^{-1} x - \sin^{-1} y = C$$

76439042536. ✖

Question Number : 35 Question Id : 76439010659 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Solution of  $(1+x^2) \frac{dy}{dx} + 2xy = \cos x$  is

Options :

$$(1+x^2)y + \sin x = C$$

76439042537. ✖

$$(1+x^2)y = \cos x + C$$

76439042538. ✖

$$(1+x^2)y = \sin x + C$$

76439042539. ✔

$$(1+x^2)y + \cos x = C$$

76439042540. ✖

Question Number : 36 Question Id : 76439010660 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A particular integral of  $(D^2 - 1) = \cosh x$

Options :

$$\frac{x}{2} \sinh x$$

76439042541. ✔

$$\frac{x}{2} \cosh x$$

76439042542. ✖



76439042543. ✖  $\sinh x$

76439042544. ✖  $\cosh x$

Question Number : 37 Question Id : 76439010661 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A particular integral of  $(D^3 + 4D)y = \sin 2x$  is

Options :

76439042545. ✖  $\frac{x \sin 2x}{2}$

76439042546. ✖  $\frac{x \sin 2x}{4}$

76439042547. ✖  $\frac{x \sin 2x}{8}$

76439042548. ✔  $\frac{-x \sin 2x}{8}$

Question Number : 38 Question Id : 76439010662 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A particular integral of  $(D^2 - 2D + 4)y = x^2$  is

Options :

76439042549. ✖  $\frac{1}{4}(x^2 - x)$

76439042550. ✔  $\frac{1}{4}(x^2 + x)$

76439042551. ✖  $\frac{1}{4}(x^2 + x + 1)$

76439042552. ✖  $\frac{1}{4}(x^2 + x - 1)$

Question Number : 39 Question Id : 76439010663 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A particular integral of  $(D^2 - 4)y = \cos^2 x$  is

Options :

76439042553. ✓  $\frac{-1}{8} - \frac{\cos 2x}{16}$

76439042554. ✗  $\frac{1}{8} - \frac{\cos 2x}{16}$

76439042555. ✗  $\frac{-1}{8} + \frac{\cos 2x}{16}$

76439042556. ✗  $\frac{1}{8} - \frac{\cos 2x}{16}$

Question Number : 40 Question Id : 76439010664 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Complementary function of  $(D^3 - D^2 + D - 1)y = 0$  is

Options :

76439042557. ✗  $y_c = c_1 e^{-x} + c_2 \cos x + c_3 \sin x$

76439042558. ✗  $y_c = c_1 \cos x + c_2 \sin x$

76439042559. ✓  $y_c = c_1 e^x + c_2 \cos x + c_3 \sin x$

76439042560. ✗  $y_c = c_1 e^{2x} + c_2 \cos 2x + c_3 \sin 2x$

Question Number : 41 Question Id : 76439010665 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A differential equation formed by eliminating the constants  $a$  and  $b$  in

$y = ae^{bx}$  is

Options :

76439042561. ✖  $y \frac{d^2 y}{dx^2} = \frac{dy}{dx}$

76439042562. ✖  $y \left( \frac{d^2 y}{dx^2} \right)^2 = \left( \frac{dy}{dx} \right)^2$

76439042563. ✖  $y \frac{dy}{dx} = \left( \frac{d^2 y}{dx^2} \right)^2$

76439042564. ✔  $y \frac{d^2 y}{dx^2} = \left( \frac{dy}{dx} \right)^2$

Question Number : 42 Question Id : 76439010666 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Solution of the differential equation  $x \frac{dy}{dx} = y (\log y - \log x + 1)$  is

Options :

76439042565. ✔  $y = xe^{cx}$

76439042566. ✖  $y = x^2 e^{cx}$

76439042567. ✖  $x = ye^{cy}$

76439042568. ✖  $x = y^2 e^{cy}$

Question Number : 43 Question Id : 76439010667 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $F(s)$  denotes the Laplace transform of  $t \sin t$ , then  $F(2) =$

Options :

76439042569. ✓ 4/25

76439042570. ✗ -4/25

76439042571. ✗ 4/5

76439042572. ✗ -4/5

Question Number : 44 Question Id : 76439010668 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $F(s)$  denotes the Laplace transform of  $\frac{\sin t}{t}$ , then  $F(1) =$

Options :

76439042573. ✗  $\pi/2$

76439042574. ✓  $\pi/4$

76439042575. ✗  $-\pi/2$

76439042576. ✗  $-\pi/4$

Question Number : 45 Question Id : 76439010669 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $F(s)$  denotes the Laplace transform of  $e^{-t} \sin t$ , then  $\lim_{s \rightarrow 0} F(s) =$

Options :

76439042577. ✗ 0

76439042578. ✗ 2

76439042579. ✓ 1/2

76439042580. ✖ -1/2

Question Number : 46 Question Id : 76439010670 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If  $f(t)$  denotes the inverse Laplace transform of  $\left[ \frac{s+2}{(s+1)(s-2)} \right]$ , then  $\lim_{t \rightarrow 0} f(t) =$

Options :

76439042581. ✖ -1

76439042582. ✖ 0

76439042583. ✖ 1/2

76439042584. ✔ 1

Question Number : 47 Question Id : 76439010671 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The inverse Laplace transform of  $\log \frac{s+1}{s-1}$  is

Options :

76439042585. ✖  $\frac{e^t + e^{-t}}{t}$

76439042586. ✖  $\frac{-e^t - e^{-t}}{t}$

76439042587. ✖  $\frac{e^{-t} - e^t}{t}$

76439042588. ✔  $\frac{e^t - e^{-t}}{t}$

Question Number : 48 Question Id : 76439010672 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The inverse Laplace Transform of  $\frac{1}{s^2(s+5)}$  is

Options :

76439042589. ✖  $t * t * e^t$

76439042590. ✔  $1 * 1 * e^{-5t}$

76439042591. ✖  $\int_0^t (1 - e^{-5\sigma}) d\sigma$

76439042592. ✖  $\int_0^t \left( \int_0^\sigma e^{-5\tau} d\tau \right) d\sigma$

Question Number : 49 Question Id : 76439010673 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Assertion (A):  $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots = \frac{\pi^2}{12}$

Reason (R): The Fourier series to represent  $x - x^2$  from  $x = -\pi$  to  $x = \pi$  is

$$-\frac{\pi^2}{3} + 4 \left[ \frac{\cos x}{1^2} - \frac{\cos 2x}{2^2} + \frac{\cos 3x}{3^2} - \dots \right] + 2 \left[ \frac{\sin x}{1} - \frac{\sin 2x}{2} + \frac{\sin 3x}{3} - \dots \right]$$

Options :

76439042593. ✖ Both A and (R) are true and (R) is correct explanation of (A)

76439042594. ✔ Both A and (R) are true but (R) is not correct explanation of (A)

76439042595. ✖ Statement (A) is true , Statement (R) is false

76439042596. ✖ Statement (A) is false , Statement (R) is true

Question Number : 50 Question Id : 76439010674 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The coefficient of  $\cos x$  in the Fourier expansion of  $f(x) = |\cos x|$ ,  $x \in [-\pi, \pi]$  is

Options :

76439042597. ✖  $4/\pi$

76439042598. ✖  $-4/\pi$

76439042599. ✖  $2/\pi$

76439042600. ✔ 0

## Physics

Section Id :	764390208
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	764390238
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 76439010675 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

$ML^2T^{-3}$  is the dimensional formula of

Options :

76439042601. ✖ Energy

76439042602. ✖ Force

76439042603. ✔ Power

76439042604. ✖ Density

Question Number : 52 Question Id : 76439010676 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Distance 'd' covered by a particle in time 't' is given by

$$d = xt + yt^2 + zt^3$$

The dimensions of x, y, z are

Options :

76439042605. ✖  $x=L, y=L, z=LT^{-1}$

76439042606. ✖  $x=L, y=LT^{-1}, z=LT^{-2}$

76439042607. ✖  $x=L, y=LT^2, z=LT^3$

76439042608. ✔  $x=LT^{-1}, y=LT^{-2}, z=LT^{-3}$

Question Number : 53 Question Id : 76439010677 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The work function of Al, K and Pt is 4.38 eV, 2.36 eV and 5.60 eV respectively. Their respective threshold frequencies would be

Options :

76439042609. ✖  $Al>Pt>K$

76439042610. ✖  $K>Al>Pt$

76439042611. ✖  $Al>K>Pt$

76439042612. ✔  $Pt>Al>K$

Question Number : 54 Question Id : 76439010678 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The critical angle of a denser medium of refraction index  $\sqrt{2}$  is

Options :



76439042613. ✖ 60°

76439042614. ✔ 45°

76439042615. ✖ 30°

76439042616. ✖ 0°

Question Number : 55 Question Id : 76439010679 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

During an adiabatic operation the pressure and density ( $P_1, d_1$ ) of a diatomic gas change to ( $P_2,$

$d_2$ ), if  $\frac{d_2}{d_1} = 243$ , then  $\frac{P_2}{P_1}$  is ( $\gamma = \frac{7}{5}$ )

Options :

76439042617. ✔ 2187

76439042618. ✖ 3187

76439042619. ✖ 4187

76439042620. ✖ 1187

Question Number : 56 Question Id : 76439010680 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A gas is heated through 1° C in a closed vessel. Its pressure is increased by 0.4%. The initial temperature of the gas is

Options :

76439042621. ✖ 23° C

76439042622. ✔ -23° C

76439042623. ✖ 33° C

76439042624. ✖ -33° C

Question Number : 57 Question Id : 76439010681 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Find the cross product of the two vectors  $2\mathbf{i} + 3\mathbf{j} + \mathbf{k}$  and  $3\mathbf{i} + 2\mathbf{j} + \mathbf{k}$ .

Options :

76439042625. ✔  $\mathbf{i} + \mathbf{j} - 5\mathbf{k}$

76439042626. ✖  $2\mathbf{i} + 3\mathbf{j} + \mathbf{k}$

76439042627. ✖  $\mathbf{i} + 2\mathbf{j} + \mathbf{k}$

76439042628. ✖  $2\mathbf{i} - \mathbf{j} - 5\mathbf{k}$

Question Number : 58 Question Id : 76439010682 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Find the angle between two vectors  $\vec{A} = 2\mathbf{i} + \mathbf{j} - \mathbf{k}$  and  $\vec{B} = \mathbf{i} - \mathbf{k}$

Options :

76439042629. ✖ 90°

76439042630. ✖ 45°

76439042631. ✖ 60°

76439042632. ✔ 30°

Question Number : 59 Question Id : 76439010683 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A car moving on a straight road accelerates from a speed of 4.1 m/s to a speed of 6.9 m/s in

5.0 s. What was its average acceleration?

Options :

76439042633. ✖  $5.6 \text{ m/s}^2$

76439042634. ✖  $1.2 \text{ m/s}^2$

76439042635. ✔  $0.56 \text{ m/s}^2$

76439042636. ✖  $1.56 \text{ m/s}^2$

**Question Number : 60 Question Id : 76439010684 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A body is projected with an initial velocity  $40 \text{ m/s}$  at  $60^\circ$  to the horizontal. Find its initial velocity vector (given  $g=10\text{m/s}^2$ ).

**Options :**

76439042637. ✖  $20\mathbf{i} - 20\mathbf{j}$

76439042638. ✔  $20\mathbf{i} + 20\sqrt{3}\mathbf{j}$

76439042639. ✖  $20\sqrt{3}\mathbf{i} + 20\mathbf{j}$

76439042640. ✖  $10\mathbf{i} + 10\sqrt{3}\mathbf{j}$

**Question Number : 61 Question Id : 76439010685 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A bomb is dropped from an aircraft travelling horizontally at  $150 \text{ ms}^{-1}$  at a height of  $490 \text{ m}$ . The horizontal distance travelled by the bomb before it hits the ground is

**Options :**

76439042641. ✖  $1800 \text{ m}$

76439042642. ✔  $1500 \text{ m}$

76439042643. ✖ 1200 m

76439042644. ✖ 1000 m

**Question Number : 62 Question Id : 76439010686 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Find the force required to move a body of mass 5 kg on a rough surface with a uniform velocity. If the coefficient of friction is 0.4

**Options :**

76439042645. ✖ 15N

76439042646. ✖ 16.5 N

76439042647. ✖ 18 N

76439042648. ✔ 19.6 N

**Question Number : 63 Question Id : 76439010687 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A body of mass 20 kg moving with a velocity of 4m/s on a horizontal rough surface stops after covering a distance 5 m, the coefficient of friction is

**Options :**

76439042649. ✔ 0.16

76439042650. ✖ 0.32

76439042651. ✖ 1.6

76439042652. ✖ 3.2

**Question Number : 64 Question Id : 76439010688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A machine gun fires 240 bullets per minute with a velocity of 500 m/s. If the mass of each of the bullet is  $5 \times 10^{-2}$  kg. then the power of the gun is

Options :

76439042653. ✖ 30,000 watts

76439042654. ✖ 20,000 watts

76439042655. ✔ 25,000 watts

76439042656. ✖ 35,000 watts

Question Number : 65 Question Id : 76439010689 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A body of mass 200 kg is moving on a horizontal plane with an acceleration  $2 \text{ m/s}^2$ , what is the work done in moving the body through a distance of 50 m.

Options :

76439042657. ✖  $3 \times 10^4 \text{ J}$

76439042658. ✔  $2 \times 10^4 \text{ J}$

76439042659. ✖  $4 \times 10^4 \text{ J}$

76439042660. ✖  $1 \times 10^4 \text{ J}$

Question Number : 66 Question Id : 76439010690 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Find the kinetic energy of a bullet of mas 0.05 kg. if it moves with a velocity of 100 m/s.

Options :

76439042661. ✖ 120 J

76439042662. ✖ 200 J

76439042663. ✓ 250 J

76439042664. ✗ 150 J

Question Number : 67 Question Id : 76439010691 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A particle is executing SHM with an amplitude of 0.2m. At what distance from the mean position the potential energy of the particle will be equal to its kinetic energy

Options :

76439042665. ✗  $\pm 0.34$  meters

76439042666. ✗  $\pm 0.24$  meters

76439042667. ✓  $\pm 0.1414$  meters

76439042668. ✗  $\pm 0.521$  meters

Question Number : 68 Question Id : 76439010692 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A seconds pendulum oscillates with an amplitude of 0.4m. If the mass of the pendulum is 0.2 kg. Then kinetic energy of the pendulum at mean position

Options :

76439042669. ✓ 0.157 J

76439042670. ✗ 2.15 J

76439042671. ✗ 1.5 J

76439042672. ✗ 3 J

Question Number : 69 Question Id : 76439010693 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Velocity of sound wave in air at 0°C is

Options :

76439042673. ✖ 350 m/s

76439042674. ✔ 330 m/s

76439042675. ✖ 360 m/s

76439042676. ✖ 380 m/s

Question Number : 70 Question Id : 76439010694 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The minimum distance to hear an echo at  $0^{\circ}\text{C}$  is

Options :

76439042677. ✖ 15 meters

76439042678. ✔ 16.5 meters

76439042679. ✖ 17 meters

76439042680. ✖ 14 meters

Question Number : 71 Question Id : 76439010695 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Read the following statements about the viscosity, then choose the correct option

A: The viscosity of liquids increases as the temperature increases

B: The viscosity of gases increases as the temperature increases

Options :

76439042681. ✖ Only A is correct

76439042682. ✖ Only B is correct

76439042683. ✓ Both A and B are correct

76439042684. ✘ Both A and B are not correct

Question Number : 72 Question Id : 76439010696 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Copper wire of length 2m is stretched by 2cm then find then the strain on the wire

Options :

76439042685. ✘ 0.02

76439042686. ✘ 0.2

76439042687. ✘ 0.1

76439042688. ✓ 0.01

Question Number : 73 Question Id : 76439010697 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Choose the correct expression for ohm's law

Options :

76439042689. ✓  $I = \frac{V}{R}$

76439042690. ✘  $I = \frac{R}{V}$

76439042691. ✘  $V = \frac{R}{I}$

76439042692. ✘  $V = \frac{I}{R}$

Question Number : 74 Question Id : 76439010698 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0



1A, 2A and 3A currents are flowing a junction then find out how much current will flow out from that junction

Options :

76439042693. ✓ 6A

76439042694. ✘ 3A

76439042695. ✘ 2A

76439042696. ✘ 1A

Question Number : 75 Question Id : 76439010699 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Read the following statements about magnetism,

A: The two poles of a magnet will have equal pole strength

B: Like poles of magnet will attract each other

C: Magnetic poles can be isolated from each other

D: The magnetism in the middle of a bar magnet is minimum

Choose the correct option from the following:

Options :

76439042697. ✘ A and B are correct

76439042698. ✘ A, B and C are correct

76439042699. ✘ A, B, C and D are correct

76439042700. ✓ A and D are correct

## Chemistry

Section Id :

764390209

Section Number :

3

Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	25
Number of Questions to be attempted :	25
Section Marks :	25
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	764390239
Question Shuffling Allowed :	Yes

Question Number : 76 Question Id : 76439010700 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The electronic configuration of  $Na^+$

Options :

76439042701. ✖  $1S^22S^22P^63S^1$

76439042702. ✖  $1S^22S^22P^63S^2$

76439042703. ✔  $1S^22S^22P^63S^0$

76439042704. ✖  $1S^22S^22P^63S^23P^1$

Question Number : 77 Question Id : 76439010701 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Number of sigma ( $\sigma$ ) and Pi ( $\pi$ ) bonds present in Nitrogen molecule

Options :

76439042705. ✖  $1\sigma,1\pi$

76439042706. ✖  $2\sigma,1\pi$

76439042707. ✖  $2\sigma,2\pi$

76439042708. ✔  $1\sigma,2\pi$

Question Number : 78 Question Id : 76439010702 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the oxidation numbers of Mn in  $\text{KMnO}_4$

Options :

76439042709. ✓ +7

76439042710. ✗ +6

76439042711. ✗ -7

76439042712. ✗ -6

Question Number : 79 Question Id : 76439010703 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Find the molarity of the solution which contain 20 g of sodium hydroxide ( $\text{NaOH}$ ) in 100 ml solution

Options :

76439042713. ✓ 5 M

76439042714. ✗ 2 M

76439042715. ✗ 1 M

76439042716. ✗ 0.5 M

Question Number : 80 Question Id : 76439010704 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Equivalent weight of sulphuric acid ( $\text{H}_2\text{SO}_4$ ) is

Options :

76439042717. ✗ 98 g

76439042718. ✓ 49 g

76439042719. ✖ 2 g

76439042720. ✖ 100 g

Question Number : 81 Question Id : 76439010705 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is not a buffer solution?

Options :

76439042721. ✖  $\text{CHCOOH} + \text{CH}_3\text{COONa}$

76439042722. ✖  $\text{NH}_4\text{Cl} + \text{NH}_4\text{OH}$

76439042723. ✔  $\text{NaOH} + \text{NaCl}$

76439042724. ✖  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COOK}$

Question Number : 82 Question Id : 76439010706 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Statement a: Ionic Product of water is  $1 \times 10^{-14}$

Statement b: pH value of neutral Solution is 7

Options :

76439042725. ✖ Both the statements are incorrect

76439042726. ✔ Both the statements are correct

76439042727. ✖ Statement 'a' is correct, 'b' is incorrect

76439042728. ✖ Statement 'a' is incorrect, 'b' is correct

Question Number : 83 Question Id : 76439010707 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the pH of  $10^{-3}$  M HCl Solution?

Options :

76439042729. ✓ 3

76439042730. ✗ 10

76439042731. ✗  $10^{-3}$

76439042732. ✗ -3

Question Number : 84 Question Id : 76439010708 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Statement a: flux +slag = gangue

Statement b: flux + gangue = slag

Options :

76439042733. ✗ Both the statements are incorrect

76439042734. ✗ Both the statements are correct

76439042735. ✗ Statement 'a' is correct, 'b' is incorrect

76439042736. ✓ Statement 'a' is incorrect, 'b' is correct

Question Number : 85 Question Id : 76439010709 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Composition of brass alloy is

Options :

76439042737. ✗ Ni-60%, Al-40%

76439042738. ✗ Cu- 60%, Ni -40%

76439042739. ✓ Cu- 60%, Zn- 40%

76439042740. ✖ Cu- 40%, Zn- 60%

Question Number : 86 Question Id : 76439010710 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The EMF of the following cell  $\text{Pt, H}_2(\text{g}) | \text{HCl}(\text{sol}) || \text{AgCl}(\text{s}) | \text{Ag}(\text{s})$  is

( given that  $E_{\text{AgCl}/\text{Ag}}^{\circ} = +0.222\text{v}$  )

Options :

76439042741. ✔ + 0.222 v

76439042742. ✖ -0.222 v

76439042743. ✖ +0.44 v

76439042744. ✖ -0.44 v

Question Number : 87 Question Id : 76439010711 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Standard reduction potential of Zn is

Options :

76439042745. ✔ -0.76 v

76439042746. ✖ +0.76 v

76439042747. ✖ +0.44 v

76439042748. ✖ + 0.642 v

Question Number : 88 Question Id : 76439010712 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which of the following is a primary factor influencing on rate of corrosion

Options :

76439042749. ✖ pH

76439042750. ✖ Temperature

76439042751. ✖ Polarization of electrode

76439042752. ✔ Nature of the metal

Question Number : 89 Question Id : 76439010713 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Formation of rust on iron is an example of

Options :

76439042753. ✖ Chemical corrosion

76439042754. ✔ Electrochemical corrosion

76439042755. ✖ Liquid metal corrosion

76439042756. ✖ Galvanic corrosion

Question Number : 90 Question Id : 76439010714 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Impressed voltage method is an example of

Options :

76439042757. ✔ Cathodic protection

76439042758. ✖ Anodic protection

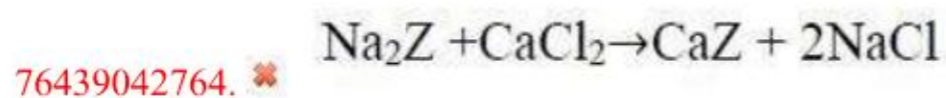
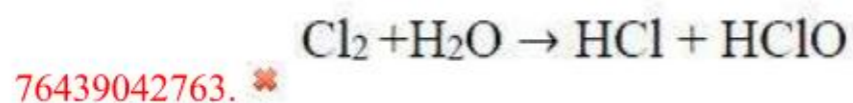
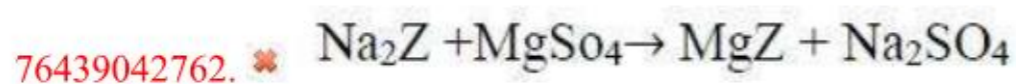
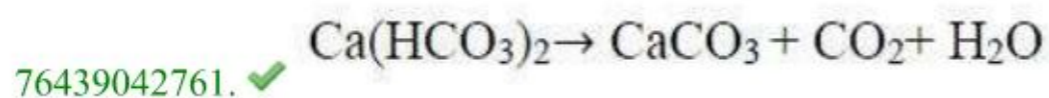
76439042759. ✖ Metal coating

76439042760. ✖ Organic coating

Question Number : 91 Question Id : 76439010715 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Indicate the right chemical equation for the removal of temporary hardness of water?

Options :



Question Number : 92 Question Id : 76439010716 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Indicate the hardness of water in degree French and degree Clark when the degree of hardness of water is 250 ppm?

Options :

76439042765. ✗ 250° Fr & 19.5° Clark

76439042766. ✗ 20.5° Fr & 14.7° Clark

76439042767. ✓ 25° Fr & 17.5° Clark

76439042768. ✗ 20.5° Fr & 17.5° Clark

Question Number : 93 Question Id : 76439010717 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the hardness of a sample of water in ppm (in equivalents of  $\text{CaCO}_3$ ) which contains 29.2 mg of  $\text{Mg}(\text{HCO}_3)_2$  per litre

Options :

76439042769. ✗ 30 mg



19 mg  
76439042770. ✖

25 mg  
76439042771. ✖

20 mg  
76439042772. ✔

Question Number : 94 Question Id : 76439010718 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which of the following statements is false?

Options :

76439042773. ✖

In addition polymerisation, polymer molecular weight rises steadily through the reaction

Addition polymerisation requires the presence of double bond in monomer  
76439042774. ✖

In addition polymerisation, growth of chain is at one active centre  
76439042775. ✔

No by-product is formed in addition polymerisation  
76439042776. ✖

Question Number : 95 Question Id : 76439010719 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which catalyst is used in the preparation of Bakelite

Options :

Benzoyl peroxide  
76439042777. ✖

Isobutylene with  $TiCl_4$   
76439042778. ✖

Acidic /Alkaline  
76439042779. ✔

Metal Chloride  
76439042780. ✖

Question Number : 96 Question Id : 76439010720 Question Type : MCQ Option Shuffling : Yes Display Question Number

: Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which rubber is used for preparing gloves and aprons?

Options :

76439042781. ✘ Buna-S rubber

76439042782. ✔ Neoprene rubber

76439042783. ✘ Butyl rubber

76439042784. ✘ Silicone rubber

Question Number : 97 Question Id : 76439010721 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Which of the following is not character of a good fuel?

Options :

76439042785. ✘ The fuel must burn with a moderate velocity

76439042786. ✔ It should possess low ignition temperature

76439042787. ✘ It should have the highest pyrometric effect

76439042788. ✘ It should possess high calorific value

Question Number : 98 Question Id : 76439010722 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical  
Correct Marks : 1 Wrong Marks : 0

Match the following and choose the right answer

- |                |   |
|----------------|---|
| 1. Atmosphere  | A. It covers sea, rivers, oceans, lakes |
| 2. Hydrosphere | B. It contains life saving oxygen       |
| 3. Lithosphere | C. The domain of living organism        |
| 4. Biosphere   | D. The solid component of the earth     |

Choose the correct option from the following:

Options :

76439042789. ✘ 1-B, 2-D, 3-A, 4-C

76439042790. ✔ 1-B, 2-A, 3-D, 4-C

76439042791. ✘ 1-D, 2-A, 3-B, 4-C

76439042792. ✘ 1-B, 2-C, 3-D, 4-A

Question Number : 99 Question Id : 76439010723 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The permissible level of a poisonous pollutant in atmosphere is known as

Options :

76439042793. ✘ Gaseous Pollutant

76439042794. ✘ Aerosol pollutant

76439042795. ✔ Threshold limit value

76439042796. ✘ Biological contaminant

Question Number : 100 Question Id : 76439010724 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Which pollutants form smog that limits the visibility of roads?

Options :

76439042797. ✘ Carbon monoxide and hydrocarbons

76439042798. ✘ Sulphur oxides and hydrocarbons

76439042799. ✘ Peroxy acetyl nitrates

76439042800. ✔ Nitrogen oxides and hydrocarbons

## Civil Engineering

Section Id :	764390210
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	100
Number of Questions to be attempted :	100
Section Marks :	100
Display Number Panel :	Yes
Group All Questions :	Yes
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	764390240
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 76439010725 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

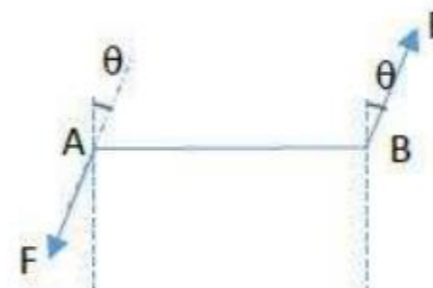
For a two forces in a member to be in equilibrium, the forces have to be

Options :

- 76439042801. ✘ only equal and opposite
- 76439042802. ✘ only colinear and coplanar
- 76439042803. ✘ only equal and collinear
- 76439042804. ✔ Equal, opposite, collinear and coplanar

Question Number : 102 Question Id : 76439010726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In the figure shown, length of AB is 'a'. What is the couple due to both parallel forces of magnitude 'F' ?



Options :

- 76439042805. ✘  $Fa \sin\theta$
- 76439042806. ✘  $Fa \tan\theta$
- 76439042807. ✔  $Fa \cos\theta$

76439042808. ✖ Fa cotθ

Question Number : 103 Question Id : 76439010727 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the location of centroid of an Isosceles triangle of base 60cm and side 50cm from the base ?

Options :

76439042809. ✖ 14.44 cm

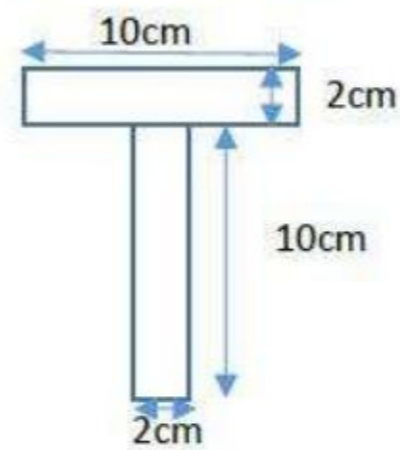
76439042810. ✔ 13.33 cm

76439042811. ✖ 20.00 cm

76439042812. ✖ 26.70 cm

Question Number : 104 Question Id : 76439010728 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the location of centroid from bottom for the T-Section shown below



Options :

76439042813. ✖ 10 cm

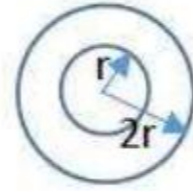
76439042814. ✔ 8 cm

76439042815. ✖ 4 cm

76439042816. ✖ 6 cm

Question Number : 105 Question Id : 76439010729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Polar moment of inertia of a hollow circular section shown in the figure below is



Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

76439042817.  $\frac{3}{8} \pi r^4$

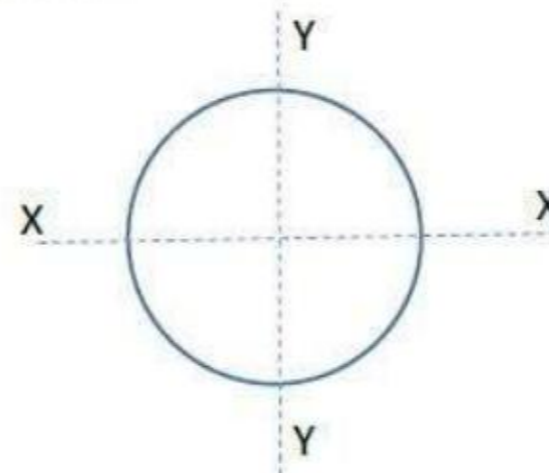
76439042818.  $\frac{3}{2} \pi r^4$

76439042819.  $\frac{3}{4} \pi r^4$

76439042820.  $\frac{3}{16} \pi r^4$

Question Number : 106 Question Id : 76439010730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the formula for theorem of perpendicular axis ?



Options :

76439042821. ✖  $I_{zz} = \sqrt{I_{xx}^2 + I_{yy}^2}$

76439042822. ✖  $I_{zz} = I_{xx} + Ah^2$

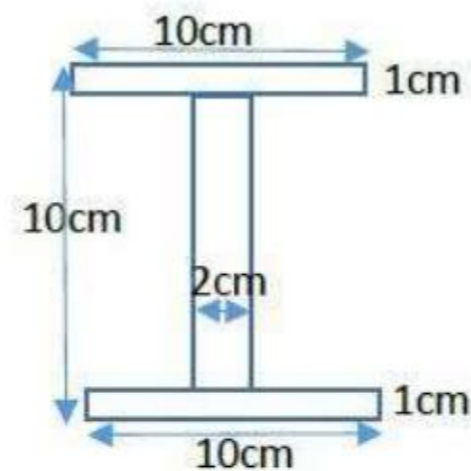
76439042823. ✔  $I_{zz} - I_{xx} = I_{yy}$

76439042824. ✖  $I_{zz} = I_{xx} - I_{yy}$

Question Number : 107 Question Id : 76439010731 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Moment of Inertia of the 'I' section given below about its major axis



Options :

76439042825. ✔ 492 cm<sup>4</sup>

76439042826. ✖ 464 cm<sup>4</sup>

76439042827. ✖ 488 cm<sup>4</sup>

76439042828. ✖ 512 cm<sup>4</sup>

Question Number : 108 Question Id : 76439010732 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Relation between three elastic moduli E (Modulus of elasticity), G (Modulus of rigidity)

and K (Bulk modulus)

Options :

76439042829. ✖  $E = \frac{9KG}{3G+K}$

76439042830. ✔  $E = \frac{9KG}{3K+G}$

76439042831. ✖  $K = \frac{9EG}{3E+G}$

76439042832. ✖ 
$$G = \frac{9EK}{3K+TE}$$

Question Number : 109 Question Id : 76439010733 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Cylindrical wire is stretched by a tensile force, such that the volume of wire is constant. Find Poisson's ratio of material of wire

Options :

76439042833. ✖ 0.25

76439042834. ✖ 0.30

76439042835. ✖ 0.40

76439042836. ✔ 0.5

Question Number : 110 Question Id : 76439010734 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the proof resilience of a square bar of area  $1600\text{mm}^2$  and 300mm long. When a load of 320 kw is applied gradually, Take  $E=2 \times 10^5$  MPa.

Options :

76439042837. ✖ 24 J

76439042838. ✖ 96 J

76439042839. ✔ 48 J

76439042840. ✖ 72 J

Question Number : 111 Question Id : 76439010735 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A simply supported beam of span 'L' is subjected to a uniformly distributed load of w/m over right half of the span. The Bending moment at mid span is

Options :



76439042841. ✖  $\frac{wl^2}{8}$

76439042842. ✔  $\frac{wl^2}{16}$

76439042843. ✖  $\frac{wl^2}{12}$

76439042844. ✖ Zero

**Question Number : 112 Question Id : 76439010736 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Two span continuous beam of each span 8 m subjected to a uniformly distributed load of 20kN/m throughout the length of the beam. The maximum hogging bending moment at the central support

**Options :**

76439042845. ✖ 128 kN-m

76439042846. ✖ 106.7 kN-m

76439042847. ✔ 160 kN-m

76439042848. ✖ 320 kN-m

**Question Number : 113 Question Id : 76439010737 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A simply supported beam AB of span 'L' carries two point loads, W each at points L/3 from A and B. What is the shear force in the Middle one-Third portion of the beam?

**Options :**

76439042849. ✖ W/2

76439042850. ✖ 2W

76439042851. ✖ W

76439042852. ✔ Zero

Question Number : 114 Question Id : 76439010738 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A Prismatic beam ABC is simply supported at point A and B spaced 8m apart and has an overhang of 2m. A uniformly distributed load of 15kN/m is acting over the entire length 'AC' and a concentrated load of 50kN is acting at 'C'. The bending moment at support B is

Options :

76439042853. ✘ 120 kN-m

76439042854. ✘ 140 kN-m

76439042855. ✔ 130 kN-m

76439042856. ✘ 150 kN-m

Question Number : 115 Question Id : 76439010739 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Beam (A) has a width 'b' and depth 'd/2', while Beam (B) has a width 'b/2' and depth (d). If bending moments applied to both beams are the same, maximum bending stresses induced in cases (A) and (B) are related as

Options :

76439042857. ✔  $\sigma_A = 2\sigma_B$

76439042858. ✘  $\sigma_A = \sigma_B/2$

76439042859. ✘  $\sigma_A = 4\sigma_B$

76439042860. ✘  $\sigma_A = \sigma_B/4$

Question Number : 116 Question Id : 76439010740 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A beam is subjected to sagging bending moment, has a cross-section which is an unsymmetrical 'I' section having over all depth of 300mm. The bending stresses in the beam at top and bottom are respectively 100 MPa and 50MPa respectively. The position of neutral axis from the bottom of the section is

Options :

76439042861. ✘ 150 mm

76439042862. ✘ 200 mm

76439042863. ✔ 100 mm

76439042864. ✘ Data is insufficient for the determination of NA

Question Number : 117 Question Id : 76439010741 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Sudden change in shear stress distribution diagram at a cross-section shows

Options :

76439042865. ✘ Sudden change in depth of the section

76439042866. ✔ Sudden change in width of the section

76439042867. ✘ Sudden change in width and depth of the section

76439042868. ✘ Gradual variation of width of section

Question Number : 118 Question Id : 76439010742 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A rectangular beam of 10cm width, is subjected to a maximum shear force of 60kN and the corresponding maximum shear stress is 3MPa, What is the depth of the section?

Options :

76439042869. ✘ 25 cm

76439042870. ✔ 30 cm

76439042871. ✘ 24cm

76439042872. ✖ 18 cm

**Question Number : 119 Question Id : 76439010743 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The diameter of a solid circular shaft is increased from 40 mm to 80 mm, all other conditions remaining unchanged, how many times is its torque carrying capacity increased?

**Options :**

76439042873. ✖ 2 times

76439042874. ✖ 4 times

76439042875. ✔ 8 times

76439042876. ✖ 16 times

**Question Number : 120 Question Id : 76439010744 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In power transmission of shafts, if polar moment of Inertia of a shaft is doubled keeping length same, the torque required to produce the same angle of twist is

**Options :**

76439042877. ✖  $1/4$  of the original value

76439042878. ✖  $1/2$  of the original value

76439042879. ✔ Double the original value

76439042880. ✖ Same as the original value

**Question Number : 121 Question Id : 76439010745 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A solid shaft of diameter 'D' carries a twisting moment that develops maximum shear stress ' $\tau$ '. If the shaft is replaced by a hollow one of outside diameter 'D' and inside diameter 'D/2', then the maximum shear stress will be

**Options :**

76439042881. ✖  $15/16\tau$

76439042882. ✔  $16/15\tau$

76439042883. ✖  $4/3\tau$

76439042884. ✖  $2\tau$

**Question Number : 122 Question Id : 76439010746 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A simply supported beam of span 'L' and uniform 'EI' is subjected to a concentrated load 'P' at the centre. Maximum deflection of the beam is

**Options :**

76439042885. ✖  $PL^3/3EI$

76439042886. ✖  $PL^4/48EI$

76439042887. ✔  $PL^3/48EI$

76439042888. ✖  $PL^3/8EI$

**Question Number : 123 Question Id : 76439010747 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The ratio of the maximum deflection of a cantilever beam of length 'L' with a concentrated load 'W' kN at the free end and that of with a uniformly distributed load 'w' kN/m (where  $w=W/L$ ) over its entire length is

**Options :**

76439042889. ✖  $3/2$

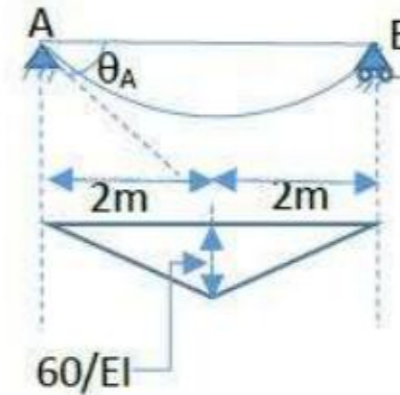
76439042890. ✖  $3/8$

76439042891. ✔  $8/3$

76439042892. ✖  $2/3$

Question Number : 124 Question Id : 76439010748 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

From the given M/EI diagram calculate the maximum slope at 'A'



Options :

76439042893. ✘ 80/EI

76439042894. ✔ 60/EI

76439042895. ✘ 100/EI

76439042896. ✘ 120/EI

Question Number : 125 Question Id : 76439010749 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The differences in slope between any two points A and B on a continuous elastic curve of a beam equal to

Options :

76439042897. ✘ Area under SF/EI curve between the points

76439042898. ✔ Area under M/EI curve between the points

76439042899. ✘ First moment of area of  $\frac{M}{EI}$  diagram between the points A and B from point B

76439042900. ✘ Second moment of M/EI diagram between the points A and B from point B

Question Number : 126 Question Id : 76439010750 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

For a circular column having its ends hinged, the slenderness ratio is '200'. The l/d ratio of the column is

Options :

76439042901. ✖ 100

76439042902. ✔ 50

76439042903. ✖ 25

76439042904. ✖ 75

Question Number : 127 Question Id : 76439010751 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

A cylindrical steel pressure vessel 600 mm in diameter with a wall thickness of 15mm. is subjected to an internal pressure of 4 MPa. Calculate the circumferential stress ( $\sigma_n$ ) and longitudinal stress ( $\sigma_y$ ) in the steel vessel.

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

76439042905.  $\sigma_x = 500$  MPa,  $\sigma_y = 100$  MPa

76439042906.  $\sigma_x = 100$  MPa,  $\sigma_y = 50$  MPa

76439042907.  $\sigma_x = 50$  MPa,  $\sigma_y = 25$  MPa

76439042908.  $\sigma_x = 25$  MPa,  $\sigma_y = 50$  MPa

Question Number : 128 Question Id : 76439010752 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

For a masonry dam of base width 'b', at which location the resultant force should act on the base so as to avoid tension anywhere in the section?

Options :

76439042909. ✔ Middle third

76439042910. ✖ middle fourth

76439042911. ✖ At the toe

76439042912. ✖ At the heel

**Question Number : 129 Question Id : 76439010753 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

As per IS-456, the partial safety factor for concrete is

**Options :**

76439042913. ✖ 1.0

76439042914. ✔ 1.5

76439042915. ✖ 1.15

76439042916. ✖ 1.75

**Question Number : 130 Question Id : 76439010754 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The shear failure can be due to the following

a) shear -tension

b) shear -compression

c) shear -bond

Choose the correct option from the following

**Options :**

76439042917. ✖ Both (a) and (b)

76439042918. ✖ Both (b) and (c)

76439042919. ✖ Both (a) and (c)

76439042920. ✔ (a), (b) and (c)



Question Number : 131 Question Id : 76439010755 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In an under reinforced concrete beam

Options :

76439042921. ✖ Actual depth of neutral axis is less than the critical depth of neutral axis

76439042922. ✖ moment of resistance is less than that of balanced section

76439042923. ✔ Actual depth of neutral axis is less than the critical depth of neutral axis and moment of resistance is less than that of balanced section

76439042924. ✖ Actual depth of neutral axis is more than the critical depth of neutral axis

Question Number : 132 Question Id : 76439010756 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The effective width of flange for a 'T' -beam may be taken as

(Where  $D_f$  – Depth of flange,  $b_w$ - breadth of web,  $l_o$  – distance between points of zero moments)

Options :

76439042925. ✖  $b_f = \frac{l_o}{12} + b_w + 6D_f$

76439042926. ✔  $b_f = \frac{l_o}{6} + b_w + 6D_f$

76439042927. ✖  $b_f = \frac{l_o}{12} + b_w + 3D_f$

76439042928. ✖  $b_f = \frac{l_o}{6} + b_w + 3D_f$

Question Number : 133 Question Id : 76439010757 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According IS:456-2000, HYSD reinforcement in either direction of a slab

shall not be less than

**Options :**

76439042929. ✖ 0.10% of the Gross Cross- sectional area

76439042930. ✔ 0.12% of the Gross Cross- sectional area

76439042931. ✖ 0.15% of the Gross Cross- sectional area

76439042932. ✖ 0.20% of the Gross Cross- sectional area

**Question Number : 134 Question Id : 76439010758 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The final deflection of a beam due to all loads including the effects of temperature, creep and shrinkage should not normally exceed

**Options :**

76439042933. ✖ Span/500

76439042934. ✖ Span/350

76439042935. ✔ Span/250

76439042936. ✖ 20mm

**Question Number : 135 Question Id : 76439010759 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The maximum area of tension reinforcement in a beam shall not exceed

(where  $d$ = effective depth of beam and  $D$ = Overall depth of beam)

**Options :**

76439042937. ✖  $0.04 bd$

76439042938. ✔  $0.04 bD$

76439042939. ✖  $0.06 bd$

76439042940. ✖  $0.06 bD$

Question Number : 136 Question Id : 76439010760 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According to IS:456-2000, the maximum compressive strain in concrete under axial compression is

Options :

76439042941. ✖ 0.0025

76439042942. ✖ 0.0035

76439042943. ✖ 0.0030

76439042944. ✔ 0.0020

Question Number : 137 Question Id : 76439010761 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According to IS:456-2000, a compression member is called as a long column when the ratio of effective length to least lateral dimension

Options :

76439042945. ✖ Exceeds 9

76439042946. ✖ Exceeds 15

76439042947. ✔ Exceeds 12

76439042948. ✖ Exceeds 3

Question Number : 138 Question Id : 76439010762 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

What is the recommended value of effective length as per IS:456-2000 for a compression member effectively held in position at both ends, but not restrained against rotation

Options :

76439042949. ✖  $0.65 l$

76439042950. ✖  $0.80 l$

76439042951. ✓ 1.00 l

76439042952. ✘ 1.20 l

**Question Number : 139 Question Id : 76439010763 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In design of a footing, the critical section for one way shear check is at

**Options :**

76439042953. ✘ the free end of footing

76439042954. ✘ the face of the column

76439042955. ✘ a distance 'd/2' (half of the effective depth) from the face of the column

76439042956. ✓ a Distance 'd' (effective depth) from the face of the column

**Question Number : 140 Question Id : 76439010764 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In design of footing, the minimum percentage of reinforced (HYSD bars) provided should be

**Options :**

76439042957. ✓ 0.12% of over-all cross-sectional area

76439042958. ✘ 0.15% of over-all cross-sectional area

76439042959. ✘ 0.2% of over-all cross-sectional area

76439042960. ✘ 0.10% of over-all cross-sectional area

**Question Number : 141 Question Id : 76439010765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

In working stress method of design, the modular ratio for M30 grade of concrete is

**Options :**

76439042961. ✘ 10.98

76439042962. ✓ 9.33

76439042963. ✖ 11.33

76439042964. ✖ 13.73

**Question Number : 142 Question Id : 76439010766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

What is the permissible tensile stress of HYSD bars of Fe 415 grade in working stress method of design

**Options :**

76439042965. ✖ 200  $N/mm^2$

76439042966. ✖ 140  $N/mm^2$

76439042967. ✓ 230  $N/mm^2$

76439042968. ✖ 190  $N/mm^2$

**Question Number : 143 Question Id : 76439010767 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A 30m long tape is held between supports under a tension of 120 N. If the tape weights 10 N, find the horizontal distance between the supports

**Options :**

76439042969. ✖ 29.9 m

76439042970. ✖ 29.09 m

76439042971. ✖ 29.009 m

76439042972. ✓ 29.991 m

**Question Number : 144 Question Id : 76439010768 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Whole circle bearing of the lines of traverse ABCDA are given below.

Line	AB	BC	CD	DA
Bearing	$70^{\circ}30^1$	$120^{\circ}45^1$	$223^{\circ}30^1$	$320^{\circ}47^1$

Determine the interior angles at A, B, C, and D respectively

Options :

76439042973. ✘  $70^{\circ}17^1$ ,  $129^{\circ}45^1$ ,  $77^{\circ}15^1$  and  $28^{\circ}43^1$

76439042974. ✔  $70^{\circ}17^1$ ,  $129^{\circ}45^1$ ,  $77^{\circ}15^1$  and  $82^{\circ}43^1$

76439042975. ✘  $70^{\circ}30^1$ ,  $120^{\circ}45^1$ ,  $223^{\circ}30^1$  and  $277^{\circ}17^1$

76439042976. ✘  $77^{\circ}30^1$ ,  $129^{\circ}45^1$ ,  $77^{\circ}15^1$  and  $82^{\circ}43^1$

Question Number : 145 Question Id : 76439010769 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Optical plummet is used

Options :

76439042977. ✘ for accurate levelling of the theodolite

76439042978. ✔ for accurate centering of the theodolite over a station

76439042979. ✘ for measuring angles in optic theodolites

76439042980. ✘ for compensating any tilt in the axis of electronic theodolites

Question Number : 146 Question Id : 76439010770 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The series of contour lines spaced widely, closely and equally indicate \_\_\_\_\_ respectively

Options :

76439042981. ✘ Steep, flat , uniform slope

76439042982. ✘ Steep, flat , non-uniform slope

76439042983. ✓ Flat, steep, uniform slope

76439042984. ✗ Flat, steep, non-uniform slope

**Question Number : 147 Question Id : 76439010771 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

For determining the area using Simpson's rule, the ordinates should be

**Options :**

76439042985. ✗ Even number

76439042986. ✗ Odd number

76439042987. ✗ Same length

76439042988. ✓ Any number and any length

**Question Number : 148 Question Id : 76439010772 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

A tacheometer was setup at station 'P' and observations were taken on a staff held at 'Q'. The vertical circle reading being zero. The readings were 1.980m, 1.660 m and 1.340m. Find the distance 'PQ'. Take instrument constants as 100 and 0.5.

**Options :**

76439042989. ✓ 64.5 m

76439042990. ✗ 6.45 m

76439042991. ✗ 645 m

76439042992. ✗ 64.5 cm

**Question Number : 149 Question Id : 76439010773 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Determine the radius of a curve, if it is designated as a  $3^0$  curve for an 30 m arc length.

**Options :**

76439042993. ✓ 573 m

76439042994. ✗ 57.3 m

76439042995. ✗ 573 cm

76439042996. ✗ 573 mm

Question Number : 150 Question Id : 76439010774 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Super elevation is

Options :

76439042997. ✗ Transverse slope provided by rising the Inner edge of the curve

76439042998. ✓ Transverse slope provided by rising the outer edge of the curve

76439042999. ✗ Longitudinal slope provided on the road

76439043000. ✗ Slope provided at the centre of the circular curve

Question Number : 151 Question Id : 76439010775 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

At a certain point in castor oil, the shear stress is  $0.216 \text{ N/m}^2$  and the velocity gradient is  $0.216/\text{s}$ . If the mass density of castor oil is  $959.42 \text{ kg/m}^3$ , find the dynamic viscosity

Options :

76439043001. ✗  $0.1 \text{ Ns/m}^2$

76439043002. ✗  $0.01 \text{ Ns/m}^2$

76439043003. ✓  $1 \text{ Ns/m}^2$

76439043004. ✗  $10 \text{ Ns/m}^2$

Question Number : 152 Question Id : 76439010776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical



Correct Marks : 1 Wrong Marks : 0

Uniform flow occurs

Options :

76439043005. ✘ when  $\frac{\partial v}{\partial t}$  is every where zero

76439043006. ✘ whenever the flow is steady

76439043007. ✔ when  $\frac{\partial v}{\partial s} = 0$

76439043008. ✘ only when the velocity vector at any point remains constant

Question Number : 153 Question Id : 76439010777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Buoyant force is

Options :

76439043009. ✔ the resultant force on a body due to the fluid surrounding it

76439043010. ✘ equal to the volume of liquid displaced

76439043011. ✘ the resultant force acting on a floating body

76439043012. ✘ the force necessary to maintain equilibrium of a submerged body

Question Number : 154 Question Id : 76439010778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Assertion (A): Bernoulli's equation is applicable to any point in the flow field provided the flow is steady and irrotational.

Reason (R): The integration of Euler's equations of motion to derive Bernoulli's equation involves the assumptions that velocity potential exists and the conditions do not change with time at any point.

Choose the correct answer:

**Options :**

76439043013. ✖ Both A and R are true but R is not the correct explanation of A

76439043014. ✔ Both A and R are true and R is the correct explanation of A

76439043015. ✖ A is true but R is false

76439043016. ✖ A is false but R is true

**Question Number : 155 Question Id : 76439010779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Consider the following statements

Statement -I: when a nozzle is fitted at the end of a long pipeline the discharge increases.

Statement-II: The velocity of flow at the nozzle end is more than that in the case of pipe without nozzle, the head in both the cases being same.

**Options :**

76439043017. ✖ Both Statements I and II are correct

76439043018. ✖ Both Statements I and II are incorrect

76439043019. ✖ Only Statement -I is correct

76439043020. ✔ Only Statement -II is correct

**Question Number : 156 Question Id : 76439010780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Coefficient of discharge for a Borda's mouthpiece when running full and running free is

**Options :**

76439043021. ✖ 0.8 and 0.5

76439043022. ✖ 0.606 and 0.5

76439043023. ✖ 0.505 and 0.3

76439043024. ✓ 0.707 and 0.5

**Question Number : 157 Question Id : 76439010781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Assertion (A): A Cipolletti weir may be considered as a rectangular weir without end contractions.

Reason (R ): The side slopes are so provided that the effect of end contraction is compensated.

Choose the correct statement:

**Options :**

76439043025. ✘ Both A and R are true but R is not the correct explanation of A

76439043026. ✓ Both A and R are true and R is the correct explanation of A

76439043027. ✘ A is true but R is false

76439043028. ✘ A is false but R is true

**Question Number : 158 Question Id : 76439010782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

At a sudden expansion in a horizontal pipe

**Options :**

76439043029. ✘ Total energy line increases in the direction of flow

76439043030. ✓ Hydraulic grade line increases in the direction of flow

76439043031. ✘ Total energy line is below hydraulic grade line

76439043032. ✘ Velocity head increases in the direction of flow

**Question Number : 159 Question Id : 76439010783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Loss of head at entrance of a pipe is given by the following formula

Options :

76439043033. ✖  $\frac{v^2}{2g}$

76439043034. ✖  $\frac{v^2}{g}$

76439043035. ✔  $0.5 \frac{v^2}{2g}$

76439043036. ✖  $\frac{0.5v^3}{2g}$

Question Number : 160 Question Id : 76439010784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The critical depth is the depth of flow at which

Options :

76439043037. ✖ The Froude number is less than unity

76439043038. ✖ The specific energy is maximum

76439043039. ✔ The specific energy is minimum

76439043040. ✖ The unit discharge is maximum

Question Number : 161 Question Id : 76439010785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A channel with constant bed slope and the same cross section along its length is known as

Options :

76439043041. ✖ Natural channel

76439043042. ✔ Prismatic channel

76439043043. ✖ Artificial channel

76439043044. ✖ Open channel

Question Number : 162 Question Id : 76439010786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match List -I and List – II and select the correct answer using the codes given below

List – I

List- II

(Turbine)

(Specific Speed)

A. Pelton

a. 25

B. Propeller

b. 75

C. Kaplan

c. 500

D. Francise

d. 800

e. 900

Options :

76439043045. ✔ A-a B-d C-e D-b

76439043046. ✖ A-c B-d C-b D-e

76439043047. ✖ A-d B-a C-e D-c

76439043048. ✖ A-a B-e C-d D-b

Question Number : 163 Question Id : 76439010787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Consider the following statements

- A. Pumps in series operation allow the head to increase
- B. Pumps in series operation increase the flow rate
- C. Pumps in parallel operation increase the flow rate
- D. Pumps in parallel operation allow the head to increase

Which of above statements are correct

Options :

76439043049. ✓ A and C

76439043050. ✗ A and D

76439043051. ✗ B and D

76439043052. ✗ C and D

Question Number : 164 Question Id : 76439010788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match List – I with List -II and select the correct answer using the codes given below

List – I

List- II

- |                     |                             |
|---------------------|-----------------------------|
| A. Flow development | a. Surge tank               |
| B. Pipe network     | b. Entrance length          |
| C. Water hammer     | c. Darcy -Weisbach equation |
| D. Fraction loss    | d. Hardy – Cross method     |

Options :

76439043053. ✓ A-b B-d C-a D-c

76439043054. ✗ A-d B-b C-c D-a

76439043055. ✗ A-b B-d C-c D-a

76439043056. ✗ A-d B-b C-a D-c

Question Number : 165 Question Id : 76439010789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

If wheat requires about 7.5 cm of water after every 28 days , and the base period for wheat is 140 days, find out the delta for wheat.

Options :

76439043057. ✘ 3.75 cm

76439043058. ✘ 375 cm

76439043059. ✔ 37.5 cm

76439043060. ✘ 0.375 cm

Question Number : 166 Question Id : 76439010790 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The drip nozzles are also called as

Options :

76439043061. ✔ Emitters

76439043062. ✘ Mains

76439043063. ✘ Laterals

76439043064. ✘ Submains

Question Number : 167 Question Id : 76439010791 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The purpose of pulviometer is to measure

Options :

76439043065. ✘ Evaporation

76439043066. ✘ Transpiration

76439043067. ✔ Precipitation

76439043068. ✖ Wind speed

Question Number : 168 Question Id : 76439010792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The optimum number of rain gauges (N) is given by the following equation

Where  $C_v$  = coefficient of variation of the rainfall

p = allowable degree of error

Options :

76439043069. ✖  $N = [c_v/p]$

76439043070. ✔  $N = \left[\frac{c_v}{p}\right]^2$

76439043071. ✖  $N = [c_v \times p]$

76439043072. ✖  $N = \left[\frac{-p}{c_v}\right]^2$

Question Number : 169 Question Id : 76439010793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

According to Dicken's formula, the Peak flood discharge is proportional to

Options :

76439043073. ✔ (area)<sup>3/4</sup>

76439043074. ✖ (area)<sup>1/2</sup>

76439043075. ✖ area

76439043076. ✖ (area)<sup>2/3</sup>

Question Number : 170 Question Id : 76439010794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0



The surcharge storage in a dam reservoir is the volume of water stored between

Options :

76439043077. ✖ Minimum and maximum reservoir levels

76439043078. ✖ Minimum and average reservoir levels

76439043079. ✖ Minimum level and flood level

76439043080. ✔ Normal and maximum reservoir levels

Question Number : 171 Question Id : 76439010795 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Silt excluders are constructed

Options :

76439043081. ✖ On the river bed downstream of the head regulator

76439043082. ✔ On the river bed upstream of the head regulator

76439043083. ✖ On the canal bed downstream of the canal head regulator

76439043084. ✖ On the upstream and downstream river bed of the head regulator

Question Number : 172 Question Id : 76439010796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match the sentences of Column A to that in Column B

Column A

- P. For an earthen dam
- Q. For an arch dam
- R. For a solid gravity dam
- S. For a barrage

Column B

- A. The rock in the abutment must be stronger than in the foundation
- B. The foundation may be rock or soil
- C. The foundation should consist of pervious material
- D. The foundation rock should be stronger than in the abutments

Choose the correct option:

Options :

76439043085. ✓ P-B, Q-A, R-D, S-C

76439043086. ✘ P-B, Q-A, R-C, S-D

76439043087. ✘ P-B, Q-C, R-D, S-A

76439043088. ✘ P-B, Q-C, R-A, S-D

Question Number : 173 Question Id : 76439010797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A core wall is provided in

Options :

76439043089. ✓ an earth dam

76439043090. ✘ a canal regulator

76439043091. ✘ an aqueduct

76439043092. ✘ a gravity dam

Question Number : 174 Question Id : 76439010798 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

An elementary triangular concrete gravity dam, supporting 60m height of reservoir water and full uplift, should have a minimum base width equal to ( take  $\sqrt{1.4} = 1.183$ )

Options :

76439043093. ✖ 36 m

76439043094. ✖ 39 m

76439043095. ✔ 51 m

76439043096. ✖ 61 m

Question Number : 175 Question Id : 76439010799 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The discharge passing over an Ogee spillway per unit length its apex line is proportional to

Where, H is the head over the apex of its crest

Options :

76439043097. ✔  $H^{3/2}$

76439043098. ✖  $H^2$

76439043099. ✖  $H^{1/2}$

76439043100. ✖  $H^{3/4}$

Question Number : 176 Question Id : 76439010800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When an irrigation canal is taken over a drainage channel, the crossing is called

Options :

76439043101. ✔ an aqueduct

76439043102. ✖ a super passage

76439043103. ✖ a level crossing

76439043104. ✖ a canal junction

**Question Number : 177 Question Id : 76439010801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

An alluvial irrigation canal is constructed with 1:1 (H:V) side slope in cutting and 2:1 in filling, and the water depth up to FSL is expected to be 'y'. A berm width equal to 'y' is left initially, which with the passage of time, and when canal attains regime conditions is likely to become

**Options :**

76439043105. ✖ 1.1 y

76439043106. ✔ 1.5 y

76439043107. ✖ 1.25 y

76439043108. ✖ 2 y

**Question Number : 178 Question Id : 76439010802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

The wetted perimeter 'P' of a stable channel is proportional to \_\_\_\_\_

**Options :**

76439043109. ✖  $Q$

76439043110. ✖  $Q^2$

76439043111. ✔  $Q^{1/2}$

76439043112. ✖  $Q^{1/3}$

**Question Number : 179 Question Id : 76439010803 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

According to IRC 73 – 1980, the roadway width of double lane National Highway in plain areas will be \_\_\_\_\_ meters

Options :

76439043113. ✓ 12

76439043114. ✗ 9

76439043115. ✗ 7.5

76439043116. ✗ 8.8

Question Number : 180 Question Id : 76439010804 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The following type of soil can be classified as problematic soil

Options :

76439043117. ✗ Silt

76439043118. ✓ Clay

76439043119. ✗ Sand

76439043120. ✗ Silt and Clay

Question Number : 181 Question Id : 76439010805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The advantage of traffic signal can be referred as \_\_\_\_\_

Options :

76439043121. ✗ No rear end collision

76439043122. ✓ Orderly movement of vehicles

76439043123. ✗ Easy segregation of traffic

76439043124. ✗ Quick movement of vehicles

Question Number : 182 Question Id : 76439010806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

In Water Bound Mecadam roads, the following material acts as binding material.

Options :

76439043125. ✘ Cement

76439043126. ✘ Brick bats

76439043127. ✘ Sand

76439043128. ✔ Stone dust

Question Number : 183 Question Id : 76439010807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The Best sleeper material that follows all the requirements of an ideal sleeper

is \_\_\_\_\_

Options :

76439043129. ✔ Wooden Sleeper

76439043130. ✘ Cast Iron Sleeper

76439043131. ✘ R.C.C. Sleeper

76439043132. ✘ Steel Sleeper

Question Number : 184 Question Id : 76439010808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A causeway is a structure constructed

Options :

76439043133. ✘ to accelerate the traffic on the highway

76439043134. ✔ to allow flood water over the road to pass over

76439043135. ✖ a Bridge to enable for passing over a cutting

76439043136. ✖ adopted for Large span bridges

Question Number : 185 Question Id : 76439010809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The approximate one span of R.C.C Slab bridge with clear span 'L' and 'd' is  
total height of pier or abutment is \_\_\_\_\_

Options :

76439043137. ✔  $L = 1.5 d$

76439043138. ✖  $L = 2.5 d$

76439043139. ✖  $L = d$

76439043140. ✖  $L = 2 d$

Question Number : 186 Question Id : 76439010810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

Match List 1 with List 2 with the following suitable options for population projection and suitability features.

(Where 'P' present population; 'P<sub>n</sub>' Projected population; 'i' is growth rate;

'n' is time period)

List - 1

- (a) Annual rate of increase
- (b) Arithmetical progression method
- (c) Geometrical progression method

List - 2

- (i)  $P_n = P + n_i$
- (ii)  $P_n = P(1 + i)^n$
- (iii)  $P_n = P \left(1 + \frac{i}{100}\right)^n$
- (iv) method is good for small towns
- (v) May give high results
- (vi) Results may be approximate

Options :

76439043141. ✖ (a) i& iv (b) ii & vi (c) iii & v

76439043142. ✖ (a) iii & v (b) ii & vi (c) i& iv

76439043143. ✖ (a) ii & v (b) i& iv (c) iii & vi

76439043144. ✔ (a) ii & vi (b) i& iv (c) iii & v

Question Number : 187 Question Id : 76439010811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

The purpose of intake structures is to

Options :

76439043145. ✖ Pump the water for supply

76439043146. ✔ Permit the withdrawal of water

76439043147. ✖ Transport the water

76439043148. ✖ Clean the water

Question Number : 188 Question Id : 76439010812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Match List 1 with List 2 with the following suitable options for water quality and affects

List – 1

List – 2

(a) Turbidity

(i) Causes tooth decay

(b) Fluorides

(ii) Bacteriological test

(c) Lead

(iii) The colour of water may change

(d) E –Coli

(iv) Possibility of Waste water entry

Options :

76439043149. ✔ (a) iii (b) i (c) iv (d) ii



76439043150. ✖ (a) ii (b) iii (c) i (d) iv

76439043151. ✖ (a) iv (b) i (c) ii (d) iii

76439043152. ✖ (a) iii (b) ii (c) iv (d) i

**Question Number : 189 Question Id : 76439010813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

List out the odd option from the give options, when water is supplied to Dead end system

**Options :**

76439043153. ✔ Water can be supplied from two directions

76439043154. ✖ Easy to find discharge and pressure

76439043155. ✖ It is easy to regulate by Valves

76439043156. ✖ It is relatively cheaper

**Question Number : 190 Question Id : 76439010814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Read the statements necessary to provide the sewer ventilating columns and are provided at

- a. Upper ends of Branch sewers
- b. At an interval of 150 m to 300 m
- c. Wherever there is change in size of sewers

Chose correct option

**Options :**

76439043157. ✖ Only (a) and (b) are correct

76439043158. ✖ Only (b) and (c) are correct

76439043159. ✖ Only (a) and (c) are correct

76439043160. ✓ (a), (b) and (c) are correct

Question Number : 191 Question Id : 76439010815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

When a sewage is decomposed and well oxidised condition, contains the following.

- a. Hydrogen Sulphide in excess
- b. Ammonia in excess
- c. Sulphites in excess
- d. Nitrites in excess

Out of the above four statements, the following is correct

Options :

76439043161. ✘ c alone is correct

76439043162. ✘ d alone is correct

76439043163. ✓ c & d correct

76439043164. ✘ a & b correct

Question Number : 192 Question Id : 76439010816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 1 Wrong Marks : 0

Natural method of disposing a sewage is called as

Options :

76439043165. ✓ Sewage Irrigation

76439043166. ✘ Aerated Lagooning

76439043167. ✘ Septic Tank

76439043168. ✘ Composting

Question Number : 193 Question Id : 76439010817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The minimum dissolved oxygen required in a river in ppm for survival of aquatic life is

Options :

76439043169. ✖ 0

76439043170. ✖ 2

76439043171. ✔ 4

76439043172. ✖ 8

Question Number : 194 Question Id : 76439010818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The shape factor for a circular section in the plastic design of a steel structure is

Options :

76439043173. ✔  $\frac{16}{3\pi}$

76439043174. ✖  $\frac{8}{3\pi}$

76439043175. ✖  $\frac{32}{3\pi}$

76439043176. ✖  $\frac{3\pi}{16}$

Question Number : 195 Question Id : 76439010819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The mode of failure in a fillet weld is

Options :

76439043177. ✖ tension

76439043178. ✖ bearing

76439043179. ✖ tearing

76439043180. ✓ shear

Question Number : 196 Question Id : 76439010820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

A plate element of a compression member may buckle before the member fails, in order to prevent this

Options :

76439043181. ✗ length is decreased

76439043182. ✗ length is increased

76439043183. ✓ thickness is decreased in relation to the length

76439043184. ✗ area is increased

Question Number : 197 Question Id : 76439010821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The forces acting on the web splice of a plate girder are

Options :

76439043185. ✓ shear force and bending moment

76439043186. ✗ axial force

76439043187. ✗ bending force and axial force

76439043188. ✗ shear force and axial force

Question Number : 198 Question Id : 76439010822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0

The plastic moment capacity of section is

Options :

76439043189. ✗ Increased by axial force and decreased by shear force

76439043190. ✗ decreased by axial force and increased by shear force

76439043191. ✖ increased by both axial force and shear force

76439043192. ✔ decreased by both axial force and shear force

**Question Number : 199 Question Id : 76439010823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

With respect to the plastic design of steel, the shape of the cross- section which has the maximum shape factor is

**Options :**

76439043193. ✖ rectangular

76439043194. ✖ I-section

76439043195. ✔ Diamond

76439043196. ✖ Solid circular

**Question Number : 200 Question Id : 76439010824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical Correct Marks : 1 Wrong Marks : 0**

Checking the local buckling of webs is not usually required while using rolled steel section because

**Options :**

76439043197. ✖ web depths are small

76439043198. ✔ depth to thickness ratio are adjusted to prevent buckling

76439043199. ✖ web stiffeners are in built in rolled steel sections

76439043200. ✖ of good quality control