# Andhra Pradesh State Council of Higher Education

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## Civil Engineering (CE)

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|---|---|
| **Group Number :** | 1 |
| **Group Id :** | 29996533 |
| **Group Maximum Duration :** | 0 |
| **Group Minimum Duration :** | 120 |
| **Show Attended Group? :** | No |
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| **Group Marks :** | 120 |
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## Civil Engineering (CE)

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| **Section Id :** | 29996533 |
| **Section Number :** | 1 |
| **Mandatory or Optional :** | Mandatory |
| **Number of Questions :** | 120 |
| **Section Marks :** | 120 |
| **Display Number Panel :** | Yes |
| **Group All Questions :** | Yes |
| **Mark As Answered Required? :** | Yes |
| **Sub-Section Number :** | 1 |
| **Sub-Section Id :** | 29996533 |
| **Question Shuffling Allowed :** | Yes |

**Question Number : 1 Question Id : 2999653841 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Suppose if $A$ is a real $3 \times 3$ orthogonal matrix, then pick the only correct statement from the following.

**Options :**

1. $det(A) = 2$

2. $det(A) = \pm 1$

3. $det(A) = \pm i$

4. $det(A) = 0$

**Question Number : 2 Question Id : 2999653842 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The maximum value of $f(x) = \frac{x}{x^2+1}$ on $[-5,\ 5]$ is _____.

**Options :**

1. 1/2

2. 5/26

3. 0

4. 1

**Question Number : 3 Question Id : 2999653843 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If one percent error is made in measuring the major and minor axes of an ellipse, the percentage error in the area of the ellipse is _____.

**Options :**

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

2. 3%

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

4. 2%



**Question Number : 4 Question Id : 2999653844 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A solution of the differential equation $\frac{d^2x}{dt^2} + 6\frac{dx}{dt} + 9x = 0$ is _____.

**Options :**

1. $x = (c_1 + c_2\, t)\, e^{-3t}$

2. $x = (c_1 + c_2\, t)\, e^{3t}$

3. $x = (c_1 + c_2\, t)\, e^{-2t}$

4. $x = (c_1 + c_2\, t)\, e^{2t}$

**Question Number : 5 Question Id : 2999653845 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The partial differential equation $\frac{\partial f}{\partial t} = \frac{\partial^2 f}{\partial x^2}$ is _____.

**Options :**

1. parabolic

2. elliptic

3. hyperbolic

4. non- linear

**Question Number : 6 Question Id : 2999653846 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If C is any path joining the points (–1, 1, 0) and (1, 2, 1), then

$$\int_C (4x^3dx + 3y^2z^2dy + 2y^3z\, dz) = \_\_\_\_\_.$$

**Options :**

1. –8

2. 8

3. 4

4. 0

**Question Number : 7 Question Id : 2999653847 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A variable $X$ has the probability distribution

| $x$ | -2 | 3 | 5 |
|---|---|---|---|
| $P(X = x)$ | 1/4 | 1/4 | 1/2 |

Then $E(X+1)^2$ is _____.

**Options :**

1. 79/4

2. 89/4

3. 99/4

4. 69/4

**Question Number : 8 Question Id : 2999653848 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The probability that a candidate P passes a test is $\frac{2}{3}$ and the probability that Q passes the same test is $\frac{3}{5}$. The probability that only one of them passes is_____.

**Options :**

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

2. $\frac{8}{15}$

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

4. $\frac{5}{9}$

**Question Number : 9 Question Id : 2999653849 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Find the solution $y(1.2)$ of the initial value problem

$$\frac{dy}{dx} = y^2 + x^2, \quad y(1) = 2, \quad h = 0.2$$

using Euler method.

**Options :**

1. 3.5

2. 3.0

3. 2.5

4. 4.0

**Question Number : 10 Question Id : 2999653850 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

f(x) is given by the following table.

| x | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| f(x) | 3 | 5 | 6 | 7 |

By the Trapezoidal rule, what is the value of $\int_2^8 f(x)\,dx$ ?

**Options :**

1. 16

2. 25

3. 18

4. 32

**Question Number : 11 Question Id : 2999653851 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If the depth of moist sand in a cylinder is 15 cm and the depth of the sand when fully inundated with water is 12 cm, the bulking of the moist sand, is _____.

**Options :**

1. 10%

2. 15%

3. 20%

4. 25%

**Question Number : 12 Question Id : 2999653852 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The best arrangement to provide unified behaviour in built up steel columns is by

**Options :**

1. Battening

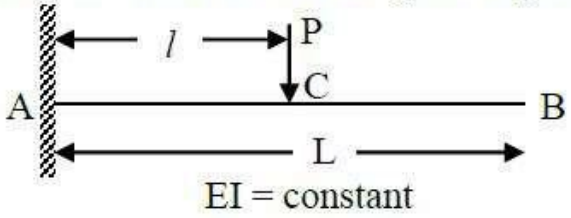
2. Lacing

3. Tie plates

4. Perforated cover plates

**Question Number : 13 Question Id : 2999653853 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A cantilever carries a load at C as shown in the given figure. The deflection at B is



**Options :**

1. $\frac{Pl^2}{2EI}(L+l)$

2. $\frac{Pl^2}{2EI}(L-l)$

3. $\frac{Pl^2}{2EI}(L+l/3)$

4. $\frac{Pl^2}{2EI}(L-l/3)$

**Question Number : 14 Question Id : 2999653854 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The difference in the strength indicated by a cube test and the strength of concrete in actual concrete (shape effect) is taken care by introducing a factor of _____.

**Options :**

1. 0.50

2. 0.45

3. 0.67

4. 1.15

**Question Number : 15 Question Id : 2999653855 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The number of independent elastic constants for a linear elastic, isotropic and homogeneous material is_____.

**Options :**

1. 4

2. 3

3. 2

4. $\frac{l}{}$

**Question Number : 16 Question Id : 2999653856 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a roof truss, the component which may be subjected to unsymmetrical bending is_____.

**Options :**

1. Principal rafters

2. Struts

3. Ties

4. Purlin

**Question Number : 17 Question Id : 2999653857 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Side face reinforcement shall be provided in the beam when depth of the web in beam exceeds_____.

**Options :**

1. 50 cm

2. 75 cm

3. 100 cm

4. 120 cm

**Question Number : 18 Question Id : 2999653858 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The elongation of a prismatic circular bar of length 'L' and cross-sectional area 'A' under its own weight, if the modulus of elasticity of the bar material is 'E' and its density is 'ρ', is _____.

**Options :**

1. $\frac{\rho L^2 g}{E}$

2. $2\frac{\rho L^2 g}{AE}$

3. $\frac{\rho L^2 g}{4AE}$

4. $\frac{\rho L^2 g}{2AE}$

**Question Number : 19 Question Id : 2999653859 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

As per IS: 456-2000, the minimum grade of concrete recommended for reinforced concrete construction under severe exposure condition is _____.

**Options :**

1. M 40

2. M35

3. M30

4. M25

**Question Number : 20 Question Id : 2999653860 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The sections at the supports of RCC continuous beams are generally designed as _____.

**Options :**

1. T-beam

2. L-beam

3. Over reinforced beam

4. Rectangular beam

**Question Number : 21 Question Id : 2999653861 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

An angle tension member ISA 75 mm ×75 mm ×10 mm with a lug angle is subjected to a design axial force of 200 kN. The strength of the bolts connecting the lug angle and the main member shall be at least _____.

**Options :**

1. 50 kN

2. 100 kN

3. 120 kN

4. 140 kN

**Question Number : 22 Question Id : 2999653862 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Tension field method is used to find _____.

**Options :**

1. Shear buckling strength of web

2. Buckling strength of flange

3. Buckling strength of column

4. Strength of tension member

**Question Number : 23 Question Id : 2999653863 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The balanced percentage of steel reinforcement of a rectangular reinforced concrete section with M30 concrete and Fe 500 steel is_____.

**Options :**

1. 0.44

2. 0.46

3. 0.62

4. 1.0

**Question Number : 24 Question Id : 2999653864 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

To find the basic wind speed at any place as per IS 875, India is divided into _____.

**Options :**

1. 3 Zones

2. 4 Zones

3. 5 Zones

4. 6 Zones

**Question Number : 25 Question Id : 2999653865 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Maximum slenderness ratio of a tension member under reversal of stress is_____.

**Options :**

1. 170

2. 160

3. 187

4. 180

**Question Number : 26 Question Id : 2999653866 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If a steel wire of diameter 0.5 mm and modulus of elasticity 200 GPa, is coiled around a pulley of diameter 400 mm, the maximum bending stress set up in the wire is_____.

**Options :**

1. 165 MPa

2. 250 MPa

3. 300 MPa

4. 500 MPa

**Question Number : 27 Question Id : 2999653867 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The splicing of the reinforcement bars in R.C.C. beams can be done at a section where _____.

**Options :**

1. shear force is zero

2. bending moment is zero

3. bending moment is less than half of the maximum bending moment on the beam

4. bending moment is more than half of the maximum bending moment on the beam

**Question Number : 28 Question Id : 2999653868 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A parabolic arched rib of span 30 m is hinged at the springing and crown and is having a central rise of 5 m. If the coefficient of thermal expansion for the arch material is $12 \times 10^{-6}$ per °C, the effect of a temperature rise of 30°C is_____.

**Options :**

1. to cause thermal stresses

2. to cause thermal stresses as well as a central rise of 18 mm

3. to cause a central rise of 18 mm

4. to cause no effect on the structure

**Question Number : 29 Question Id : 2999653869 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The stiffness matrix of a beam element is given by $\frac{2EI}{L}\begin{bmatrix}2 & 1\\ 1 & 2\end{bmatrix}$. Then the flexibility matrix is _____.

**Options :**

1. $\frac{L}{2EI}\begin{bmatrix}2 & 1\\ 1 & 2\end{bmatrix}$

2. $\frac{L}{5EI}\begin{bmatrix}2 & -1\\ -1 & 2\end{bmatrix}$

3. $\frac{L}{3EI}\begin{bmatrix}2 & -1\\ -1 & 2\end{bmatrix}$

4. $\frac{L}{6EI}\begin{bmatrix}2 & -1\\ -1 & 2\end{bmatrix}$

**Question Number : 30 Question Id : 2999653870 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The ratio of the shape factors for beam cross sections having rectangular, circular and triangular shapes and of same areas is _____.

**Options :**

1. 1.00 : 0.73 : 0.64

2. 1.00 : 0.88 : 1.38

3. 1.00 : 1.13 : 1.56

4. 1.00 : 1.56 : 1.13



**Question Number : 31 Question Id : 2999653871 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The least permissible clear dimension of the web of thickness t in the panel of a plate girder, is restricted to_____.

**Options :**

1. 180 t

2. 150 t

3. 160 t

4. 170 t

**Question Number : 32 Question Id : 2999653872 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In reinforced concrete column design, the percentage of the gross cross sectional area used as longitudinal reinforcement shall not be more than_____.

**Options :**

1. 0.8%

2. 1%

3. 3%

4. 6%

**Question Number : 33 Question Id : 2999653873 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Superplasticizers are_____.

**Options :**

1. additives applied to bitumen to improve its low melting point

2. water- reducing admixtures for concrete

3. additives applied to bitumen to improve its viscosity

4. accelerating admixtures

**Question Number : 34 Question Id : 2999653874 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A fixed beam of span 'L' is subjected to uniformly distributed load of 'w' kN/m over its entire span. The distance of points of contraflexure from the supports is_____.

**Options :**

1. 0.212 L

2. 0.25 L

3. 0.5 L

4. 0.1 L

**Question Number : 35 Question Id : 2999653875 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Shape factor of circular section is

**Options :**

1. 1.897

2. 1.500

3. 1.697

4. 2.898

**Question Number : 36 Question Id : 2999653876 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The maximum strain in Fe 500 grade tension reinforcement at failure for the limit state of collapse in flexure shall be _____.

**Options :**

1. not less than $4.175\times10^{-3}$

2. not more than $2.175\times10^{-3}$

3. not more than 0.002

4. not more than $4.175 \times 10^{-3}$

**Question Number : 37 Question Id : 2999653877 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

As per IS 800:2007, the maximum bearing pressure of M30 grade concrete pedestal of a slab base is _____.

**Options :**

1. $30\ N/mm^2$

2. $25\ N/mm^2$

3. $20\ N/mm^2$

4. $18\ N/mm^2$

**Question Number : 38 Question Id : 2999653878 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Only transverse stiffeners are required in a plate girder when_____.

**Options :**

1. $d/t_w \leq 67$

2. $200 \geq d/t_w > 67$

3. $d/t_w > 200$

4. $d/t_w \leq 85$

**Question Number : 39 Question Id : 2999653879 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The polar moment of inertia of a sphere of mass M and radius R is_____.

**Options :**

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

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

3. $\frac{4}{5}MR^2$

4. $\frac{3}{5}MR^2$

**Question Number : 40 Question Id : 2999653880 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The loss of prestress due to creep of stress in steel when the initial prestress is 50% of its characteristic ultimate tensile strength of prestressing of steel is_____.

**Options :**

1. 0 MPa

2. 35 MPa

3. 70 MPa

4. 90 MPa

**Question Number : 41 Question Id : 2999653881 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The appropriate field test to determine the in-situ undrained shear strength of very soft clay is_____.

**Options :**

1. Standard Penetration Test (SPT)

2. Plate Load Test

3. Static Cone Penetration Test (SCPT)

4. Vane Shear Test

**Question Number : 42 Question Id : 2999653882 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The actual bearing pressure distribution under a rigid footing resting on clay is_____.

**Options :**

1. less at the edges as compared to that at the middle

2. unpredictable

3. more at the edges as compared to that at the middle

4. uniform throughout

**Question Number : 43 Question Id : 2999653883 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Undisturbed soil samples are required for conducting_____.

**Options :**

1. Hydrometer test

2. Plastic limit test

3. Consolidation test

4. Specific gravity test

**Question Number : 44 Question Id : 2999653884 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The shape factor of a flow net with 28 equipotential drops and 7 flow channels is _____.

**Options :**

1. 4

2. 0.25

3. 2

4. 0.5

**Question Number : 45 Question Id : 2999653885 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If a soil has a discharge velocity of $6 \times 10^{-7}$ m/s at a void ratio of 0.5, then its seepage velocity is _____.

**Options :**

1. $18 \times 10^{-7}$ m/s

2. $12 \times 10^{-7}$ m/s

3. $6 \times 10^{-7}$ m/s

4. $3 \times 10^{-7}$ m/s

**Question Number : 46 Question Id : 2999653886 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following is not correct in respect of direct shear test?

**Options :**

1. Applicable for cohesionless soils.

2. Failure plane is predefined.

3. Shearing of soil is affected by the metallic walls of the shear box.

4. All tests such as UU, CU and CD tests can be effectively performed.

**Question Number : 47 Question Id : 2999653887 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A saturated clay deposit 4 m thick took 4 hours to achieve 90% consolidation under single drainage condition. For the same soil, time required to achieve 90% consolidation under double drainage condition is_____.

**Options :**

1. 16 hours

2. 8 hours

3. 4 hours

4. 1 hour

**Question Number : 48 Question Id : 2999653888 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The roller best suitable for compaction of clayey soils is_____.

**Options :**

1. Sheep's foot roller

2. Vibratory roller

3. Grid roller

4. Smooth steel roller

**Question Number : 49 Question Id : 2999653889 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The Westergaard analysis is used for_____.

**Options :**

1. Cohesive soils

2. Sandy soils

3. Homogenous soils

4. Stratified soils

**Question Number : 50 Question Id : 2999653890 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The particle size distribution with a hump is obtained for a_____.

**Options :**

1. Well graded soil

2. Poorly graded soil

3. Gap graded soil

4. Uniform soil

**Question Number : 51 Question Id : 2999653891 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The reduction factor to the bearing capacity of a soil due to the water table at a depth equal to or greater that the width of the footing below the footing base is_____.

**Options :**

1. 0.25

2. 0.75

3. 1.0

4. 0.5

**Question Number : 52 Question Id : 2999653892 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A pile is driven with a single acting steam hammer of weight 25 kN with a free fall of 900 mm, the average set value per blow is 2.5 mm. The allowable pile load capacity according to Engineering News Record Formula is _____. [F = 6; Full efficiency is considered.]

**Options :**

1. 278 kN

2. 429 kN

3. 571 kN

4. 750 kN

**Question Number : 53 Question Id : 2999653893 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Cohesion in soil_____.

**Options :**

1. increases active pressure and decreases passive resistance

2. decreases both active pressure and passive resistance

3. decreases active pressure and increases passive resistance

4. increases both active pressure and passive resistance

**Question Number : 54 Question Id : 2999653894 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A Standard Penetration Test is conducted in fine sand below water table and a value of 35 is obtained for N after applying overburden correction. Then the corrected final value of N is _____.

**Options :**

1. 15

2. 35

3. 25

4. 40

**Question Number : 55 Question Id : 2999653895 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The minimum number of bored cast-in-situ piles to be used to support a column is_____.

**Options :**

1. 3

2. 1

3. 2

4. 4

**Question Number : 56 Question Id : 2999653896 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Proportioning of footings in granular soils is generally governed by_____.

**Options :**

1. Shear failure criterion

2. Settlement criterion

3. Both shear and settlement criteria

4. Sliding criterion

**Question Number : 57 Question Id : 2999653897 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The negative skin friction on a pile develops if_____.

**Options :**

1. the soil surrounding pile is recently filled up

2. the water table rises

3. if the soil surrounding pile is dense sand

4. the soil surrounding pile is stiff clay

**Question Number : 58 Question Id : 2999653898 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If the settlement of a 0.3 m × 0.3 m test plate under a load of 200 kN/m$^2$ in saturated clay is 6 mm, what will be the settlement of a 1.5 m × 1.5 m square footing under the same load intensity?

**Options :**

1. 6 mm

2. 30 mm

3. 12 mm

4. 16.7 mm

**Question Number : 59 Question Id : 2999653899 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following methods shall be used for stability analysis of slopes of larger heights?

**Options :**

1. Swedish circle method

2. Bishop's method

3. Rankine's method

4. Taylor's method

**Question Number : 60 Question Id : 2999653900 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The inclination of failure plane with vertical in a cohesive soil (Cu = 40 $kN/m^2$, $\Phi$ = 20°) specimen in unconfined compression test will be_____.

**Options :**

1. 45°

2. 35°

3. 32.5°

4. 65°

**Question Number : 61 Question Id : 2999653901 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The depth of centre of pressure on a vertical rectangular gate (4 m wide, 3 m high) with water up to top surface is_____.

**Options :**

1. 1.0 m

2. 1.5 m

3. 2.0 m

4. 2.5 m

**Question Number : 62 Question Id : 2999653902 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a centrifugal pump casing, the flow of water leaving the impeller is _____.

**Options :**

1. Rectilinear

2. Radial

3. Free vortex

4. Forced vortex

**Question Number : 63 Question Id : 2999653903 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Lacey's equation can be used for the design of_____.

**Options :**

1. Unlined channels only

2. Lined channels only

3. Both lined and unlined channels

4. Neither lined nor unlined channels

**Question Number : 64 Question Id : 2999653904 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A border strip is to be irrigated by a stream with a discharge of 0.04 cumecs. If the average infiltration rate is 4 cm/hour, then the maximum area of the strip that can be irrigated is_____.

**Options :**

1. 0.15 ha

2. 0.23 ha

3. 0.52 ha

4. 0.36 ha

**Question Number : 65 Question Id : 2999653905 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A 6-hour unit-hydrograph of a catchment is triangular in shape with a base of 75 hours and a peak discharge of 12 $m^3/s$. This unit-hydrograph refers to a catchment of area, _____ in sq.km.

**Options :**

1. 65

2. 162

3. 320

4. 1800

**Question Number : 66 Question Id : 2999653906 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A column of 30 cm of petrol of specific gravity 0.680 is equivalent to _____.

**Options :**

1. 0.1 bar

2. 2000 Pa

3. 760 mm Hg

4. 3000 Pa

**Question Number : 67 Question Id : 2999653907 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

What is the probability that a T-year return period rainfall will occur at least once in N years?

**Options :**

1. $1-\left(1-\frac{1}{T}\right)^N$

2. $\left(1-\frac{1}{T}\right)^N$

3. $\frac{1}{T}\left(1-\frac{1}{T}\right)^N$

4. $1-\frac{1}{T}\left(1-\frac{1}{T}\right)^N$

**Question Number : 68 Question Id : 2999653908 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Dupuit's assumption is that_____.

**Options :**

1. Ground water flow is hydrostatic

2. Ground water flow is non-hydrostatic

3. Equipotential lines are horizontal

4. Ground water flows vertically



**Question Number : 69 Question Id : 2999653909 Question Type : MCQ Display Question Number : Yes Is Question**

**Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A fluid of viscosity equal to 1.5 poise is flowing through a thin pipe of diameter 300 mm.

The hydraulic mean depth is _____.

**Options :**

1. 450 mm

2. 300 mm

3. 150 mm

4. 75 mm

**Question Number : 70 Question Id : 2999653910 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A canal aligned at right angles to the contour is known as_____.

**Options :**

1. Watershed canal

2. Side slope canal

3. Branch canal

4. Contour canal

**Question Number : 71 Question Id : 2999653911 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Bernoulli's theorem is applicable to _____.

**Options :**

1. compressible fluids

2. unsteady flow

3. non-uniform flow

4. incompressible fluids

**Question Number : 72 Question Id : 2999653912 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Boundary layer thickness is the distance from the boundary to the point where velocity of the fluid is _____.

**Options :**

1. equal to 10% of free stream velocity

2. equal to 50% of free stream velocity

3. equal to 90% of free stream velocity

4. equal to 99% of free stream velocity.

**Question Number : 73 Question Id : 2999653913 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In steady laminar flow of a liquid through a circular pipe of internal diameter D, carrying a constant discharge, the hydraulic gradient is proportional to _____.

**Options :**

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

2. $D^2$

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

4. $D^4$

**Question Number : 74 Question Id : 2999653914 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The percentage error in the computed discharge over a triangular notch corresponding to an error of 1% in the measurement of the head over the notch would be _____.

**Options :**

1. 1.0

2. 1.5

3. 2.0

4. 2.5

**Question Number : 75 Question Id : 2999653915 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The cross regulator is provided mainly _____

**Options :**

1. to control the discharge into the off - take canal.

2. to maintain proper levels in the main canal.

3. to control the silt entry into the off-take canal.

4. to allow the silt entry into the off-take canal.

**Question Number : 76 Question Id : 2999653916 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

An aquifer was found to have a porosity of 40% and a specific retention of 10%. The specific yield of the aquifer is _____.

**Options :**

1. 10%

2. 30%

3. 40%

4. 50%

**Question Number : 77 Question Id : 2999653917 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Furrow method of irrigation is suitable for

**Options :**

1. leafy vegetables

2. wheat

3. fodder

4. sugarcane

**Question Number : 78 Question Id : 2999653918 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Equivalent pipes have the same _____.

**Options :**

1. head loss and discharge

2. diameter and length

3. head loss and diameter

4. head loss and length

**Question Number : 79 Question Id : 2999653919 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The vertical hydraulic conductivity of the top soil at certain stage is 0.2 cm/hour. A storm of intensity 0.5 cm/hour occurs over the soil for an indefinite period. Assuming the surface drainage to be adequate, the infiltration rate after the storm has lasted for a very long time, shall be_____.

**Options :**

1. smaller than 0.2 cm/hour

2. 0.2 cm/hour

3. between 0.2 and 0.5 cm/hour

4. 0.5 cm/hour

**Question Number : 80 Question Id : 2999653920 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The intermediate sheet pile is ineffective if it_____.

**Options :**

1. is larger in length than the outer ones.

2. is smaller in length than the outer ones

3. is equal in length to the outer ones

4. is far off from the outer ones

**Question Number : 81 Question Id : 2999653921 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a venturimeter, the divergent cone is kept_____

**Options :**

1. shorter than convergent cone.

2. equal to convergent cone.

3. longer than convergent cone.

4. independent of convergent cone.

**Question Number : 82 Question Id : 2999653922 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A catchment has nine rain gauge stations. The average annual rainfall and standard deviation recorded by these gauges are 100 cm and 25 cm respectively. The minimum number of the rain gauges in the catchment for estimating the mean rainfall with an error of less than 5% are_____.

**Options :**

1. 10

2. 15

3. 20

4. 25

**Question Number : 83 Question Id : 2999653923 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A rectangular open channel of width 4 m is required to discharge 8 $m^3/s$ with water depth 1 m. If Chezy's constant is 60, the necessary bed slope is _____.

**Options :**

1. 1 in 900

2. 1 in 800

3. 1 in 700

4. 1 in 600

**Question Number : 84 Question Id : 2999653924 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A turbine working under a head of 144 m and running at 300 rpm generates 7500 kW power. The unit speed is _____.

**Options :**

1. 44 rpm

2. 25 rpm

3. 30 rpm

4. 75 rpm

**Question Number : 85 Question Id : 2999653925 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The speed-discharge characteristic curve of a centrifugal pump in the form of a straight line passing through origin indicates that_____.

**Options :**

1. head is constant.

2. discharge is constant

3. efficiency is constant

4. power is constant

**Question Number : 86 Question Id : 2999653926 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

For a steady incompressible laminar flow between two infinite parallel stationary plates, the shear stress variation is _____.

**Options :**

1. linear with zero value at the plates

2. linear with zero value at the center

3. quadratic with zero value at the plates

4. quadratic with zero value at the center

**Question Number : 87 Question Id : 2999653927 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The kinetic energy correction factor for a fully developed laminar flow through a circular pipe is _____.

**Options :**

1. 1.00

2. 1.33

3. 2.00

4. 1.50

**Question Number : 88 Question Id : 2999653928 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Pitot tube is used for measuring_____.

**Options :**

1. capillarity

2. velocity of flow

3. rate of flow

4. pressure

**Question Number : 89 Question Id : 2999653929 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The runaway speed of a hydraulic turbine is_____.

**Options :**

1. speed at maximum permissible load

2. speed with no load and the gates open fully

3. the speed at no load and the gates open fully

4. the speed at which there will be no damage

**Question Number : 90 Question Id : 2999653930 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In a rainfall frequency analysis, if the symbols T, N and m represent recurrence interval, number of years of record and serial number of particular event arranged in decreasing order. Which of the following is used in California method?

**Options :**

1. $T = \frac{N}{m}$

2. $T = \frac{N+1}{m}$

3. $T = \frac{N}{1+m}$

4. $T = \frac{N}{1-m}$

**Question Number : 91 Question Id : 2999653931 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

With self-cleansing velocity in sewers_____.

**Options :**

1. silting occurs at bottom

2. scouring occurs at bottom

3. both silting and scouring occur at bottom

4. neither silting nor scouring occurs at bottom

**Question Number : 92 Question Id : 2999653932 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The settling velocity of the particles larger than 0.06 mm in a settling tank of depth 2.4 m is 0.33 m/s. The detention period recommended for the tank is _____.

**Options :**

1. 30 minutes

2. 1 hour

3. 1 hour and 30 minutes

4. 2 hours

**Question Number : 93 Question Id : 2999653933 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Acoustics of an auditorium is considered to be excellent when its reverberation time is between_____.

**Options :**

1. 0.50 to 1.50 s

2. 1.50 to 2.00 s

3. 2.00 to 3.00 s

4. 3.00 to 5.00 s

**Question Number : 94 Question Id : 2999653934 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In sewage having fully oxidized organic matter, the nitrogen exists in the form of_____.

**Options :**

1. Nitrites

2. Nitrates

3. Free ammonia

4. Aluminoid Nitrogen

**Question Number : 95 Question Id : 2999653935 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The $BOD_6$ of a wastewater is determined to be 400 mg/$l$ at 20°C. The k value at 20°C is known to be 0.23 per day. What would be $BOD_8$ value if tests were run at 15°C?

**Options :**

1. 534 mg/$l$

2. 410 mg/$l$

3. 53.4 mg/$l$

4. 41 mg/$l$



**Question Number : 96 Question Id : 2999653936 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The non-carbonate hardness of water with total alkalinity of 250 mg/*l* and 140 mg/*l* of $Ca^{++}$ and 72 mg/*l* of $Mg^{++}$ is_____.

**Options :**

1. 250 mg/*l*
2. 300 mg/*l*
3. 350 mg/*l*
4. 400 mg/*l*

**Question Number : 97 Question Id : 2999653937 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The organic matter in water can be detected by the presence of_____.

**Options :**

1. Hydrogen
2. Oxygen
3. Nitrogen
4. Chlorine

**Question Number : 98 Question Id : 2999653938 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The landfill method of waste management is very effective, if the municipal solid waste contains_____.

**Options :**

1. high organic material
2. high inorganic material
3. material of high calorific value

4. plastic

**Question Number : 99 Question Id : 2999653939 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Identify the form of chlorine that is not effective during process of sterilization of water.

**Options :**

1. Tri-chloramine

2. Di-chloramine

3. Hypochlorous

4. Molecular chlorine

**Question Number : 100 Question Id : 2999653940 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A rapid test to indicate the intensity of pollution in river water is_____.

**Options :**

1. BOD

2. DO

3. MPN

4. TDS

**Question Number : 101 Question Id : 2999653941 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The allowable noise level in residential area as per WHO standards is _____.

**Options :**

1. 100 dB

2. 75 dB

3. 50 dB

4. 25 dB

**Question Number : 102 Question Id : 2999653942 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Methemoglobinemia, the blue baby syndrome is caused by consuming water containing excess of_____.

**Options :**

1. flouride

2. phosphate

3. nitrate

4. nitrite

**Question Number : 103 Question Id : 2999653943 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following air pollutants under mild dose will cause epinasty and leaf abscission in plants?

**Options :**

1. Sulphur dioxide

2. Ozone

3. Ethylene

4. PAN

**Question Number : 104 Question Id : 2999653944 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Water distribution systems are sized to meet the _____.

**Options :**

1. maximum hourly demand

2. average hourly demand

3. maximum daily demand and fire demand

4. average daily demand and fire demand

**Question Number : 105 Question Id : 2999653945 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The two main parameters that reflect the quality of municipal sewage are _____.

**Options :**

1. pH and BOD

2. pH and salinity as TDS

3. BOD and TSS

4. BOD and COD

**Question Number : 106 Question Id : 2999653946 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Clapeyron's theorem is applied to_____.

**Options :**

1. simply supported beam

2. fixed beam

3. propped cantilever beam

4. fixed and continuous beams

**Question Number : 107 Question Id : 2999653947 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The function of automobile catalytic converter is to control emissions of_____.

**Options :**

1. Carbon dioxide and hydrogen

2. Carbon monoxide and hydrogen

3. Carbon monoxide and carbon dioxide

4. Carbon monoxide and nitrogen dioxide

**Question Number : 108 Question Id : 2999653948 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Grading of Bitumen is based on_____.

**Options :**

1. penetration value

2. softening point

3. specific gravity

4. ductility

**Question Number : 109 Question Id : 2999653949 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

If the super elevation is not provided on a horizontal curve of a highway, then on which portion of the road, pot holes are likely to develop?

**Options :**

1. Outer edge of road

2. Inner edge of road

3. Centre of road

4. Shoulder of road

**Question Number : 110 Question Id : 2999653950 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following is not a desirable property of subgrade soil as a highway material?

**Options :**

1. Stability

2. Ease of compaction

3. Good drainage

4. Bitumen adhesion

**Question Number : 111 Question Id : 2999653951 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The plan of a survey plotted to a scale of 10 m to 1 cm is reduced in a such a way that a line originally 10 cm long now measures 9 cm. The area of the reduced plan is measured as 81 $cm^2$. The actual area ($m^2$) of the survey is_____.

**Options :**

1. 10000

2. 6561

3. 1000

4. 656

**Question Number : 112 Question Id : 2999653952 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A light house of 120 m height is just visible above the horizon from a ship. The correct distance (m) between the ship and the light house considering combined for curvature and refraction, is_____.

**Options :**

1. 39.098

2. 42.226

3. 39098

4. 42226

**Question Number : 113 Question Id : 2999653953 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The accurate method of locating the survey stations is _____.

**Options :**

1. Compass Survey

2. Chain Survey

3. Triangulation

4. Theodolite Survey

**Question Number : 114 Question Id : 2999653954 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Which of the following sights is applicable for a change of instrument station?

**Options :**

1. Backsight.

2. Foresight.

3. Backsight and Intermediate sight.

4. Backsight and Foresight.

**Question Number : 115 Question Id : 2999653955 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The direction of the magnetic meridian is established at each traverse station and the direction of line is determined with reference to the magnetic meridian. This type of traversing is called as _____.

**Options :**

1. Fast needle method

2. Free needle method

3. Bearing method

4. Fixed method.

**Question Number : 116 Question Id : 2999653956 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The space mean speed (kmph) and density (vehicles/km) of a traffic stream are linearly related. The free flow speed and jam density are 80 kmph and 100 vehicles/km respectively. The traffic flow (in vehicles/h) corresponding to a speed of 40 kmph is_____.

**Options :**

1. 1800

2. 2000

3. 2200

4. 2500

**Question Number : 117 Question Id : 2999653957 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

In VG30 grade of bitumen. "30" represents_____

**Options :**

1. penetration value of 30.

2. viscosity of 30 poise.

3. penetration value of 300.

4. viscosity of 3000 poise.

**Question Number : 118 Question Id : 2999653958 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

The expression for the length of a transition curve (L) in meter is given by_____.

(where C = rate of change of radial acceleration in $m/s^2$, R = radius of circular curve in meters and V = speed of the vehicle in kmph).

**Options :**

1. $L = \frac{V^3}{CR}$

2. $L = \frac{V^3}{16CR}$

3. $L = \frac{V^3}{24CR}$

4. $L = \frac{V^3}{48CR}$

**Question Number : 119 Question Id : 2999653959 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

A cement concrete pavement has 200 mm thickness. If the coefficient of friction between the pavement and the supporting layer is 1.25 and the allowable tensile stress in concrete is limited to 0.1 $N/mm^2$, the spacing between contraction joints is_____.

**Options :**

1. 0.6 m

2. 3.6 m

3. 6.6 m

4. 4.6 m

**Question Number : 120 Question Id : 2999653960 Question Type : MCQ Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical**

Dumpy level cannot be used for_____.

**Options :**

1. Precise levelling

2. Profile levelling

3. Trigonometric levelling

4. Differential levelling