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TELANGANA STATE PUBLIC SERVICE COMMISSION

ASSISTANT EXECUTIVE ENGINEERS (CIVIL)

NOTIFICATION NO: 8/2015

CIVIL ENGINEERING PAPER

DATE OF EXAM: 20/09/2015

Group 1

Group Number :	1
Group Id :	2
Group Maximum Duration :	0
Group Minimum Duration :	150
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	300.0

Civil Engineering

Section Id :	2
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	150
Number of Questions to be attempted:	150
Section Marks:	300.0

Sub-Section Number:	1
Sub-Section Id:	2
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 151 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The main Constituent of cement which is responsible for initial setting of cement is

Options :

1. ☐ di-calcium Silicate
2. ☐ tri- calcium silicate
3. ☒ tri-calcium aluminate

4. ✖ tri-calcium alumino ferrite

Question Number : 2 Question Id : 152 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which of the following Cement is suitable for use in massive concrete structures such as large dams

Options :

1. ✖ ordinary Portland cement
2. ✖ low heat cement
3. ✖ rapid hardening cement
4. ✖ sulphate resisting cement

Question Number : 3 Question Id : 153 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Mean target strength $[f_t]$ is given by

(Where f_{ck} is 28 day Characteristic compressive strength and 'S' is Standards deviation.)

Options :

1. ✖ $f_t = f_{ck} + 0.65 s$
2. ✖ $f_t = f_{ck} - 1.65 s$
3. ✖ $f_t = f_{ck} + 1.65 s$
4. ✖ $f_t = f_{ck} - 0.65 s$

Question Number : 4 Question Id : 154 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In which of the following directions, the strength of timber is maximum?

Options :

1. ✖ parallel to grains
2. ✖ 45°
3. ✖ perpendicular to grains
4. ✖ same in all directions

Question Number : 5 Question Id : 155 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Hydraulic lime is obtained by

Options :

1. ✖ burning of limestone
2. ✖ burning of gravel
3. ✖ adding water to quicklime
4. ✖ calcination of pure clay

Question Number : 6 Question Id : 156 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Soundness of cement is tested by

Options :

1. ☐ Blaine's method
2. ☐ Le chatelier method
3. ☐ Autoclave method
4. ☒ Blains and Lechatelier methods

Question Number : 7 Question Id : 157 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Solvent commonly used for oil paints is

Options :

1. ☐ tar
2. ☒ petrol
3. ☐ acquaregia
4. ☐ turpentine

Question Number : 8 Question Id : 158 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Number of bricks required for one cubic metre of brick masonry is

Options :

1. ☐ 400
2. ☐ 450
3. ☒ 500
4. ☐ 550

Question Number : 9 Question Id : 159 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Admixtures which cause early setting and hardening of concrete are called

Options :

1. ☐ workability admixtures
2. ☒ accelerators
3. ☐ retarders
4. ☐ air entraining agents

Question Number : 10 Question Id : 160 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which of the following metamorphic rocks has the most weather resisting characteristics?

Options :

1. ☐ Marble
2. ☒ Quartzite
3. ☐ Slate
4. ☐ Lime stone

Question Number : 11 Question Id : 161 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The ratio of strength of a solid shaft to hollow shaft for same material, same weight and same length is

Options :

1. ✖ 1.44
2. ✖ 1.0
3. ✖ 0.694
4. ✖ 0.5

Question Number : 12 Question Id : 162 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The ratio of the moment of inertia of a circular plate of diameter same as that of a side of a square plate is

Options :

1. ✖ less than one
2. ✖ more than one
3. ✖ equal to one
4. ✖ equal to $37/16$

Question Number : 13 Question Id : 163 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The maximum twisting moment, a shaft can resist, is the product of the permissible shear stress and

Options :

1. ✖ moment of inertia
2. ✖ polar moment of inertia
3. ✖ modulus of rigidity
4. ✖ polar modulus

Question Number : 14 Question Id : 164 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The ratio of longitudinal stress to circumferential stress in the case of a thin cylindrical shell is

Options :

1. ✖ 1.5
2. ✖ 2
3. ✖ 1
4. ✖ 0.5

Question Number : 15 Question Id : 165 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The maximum bending moment for a simply supported beam subjected to uniformly varying load with zero intensity at the right end and w per meter length at the left end is

Options :

1. ✖ $w l^2/9$
2. ✖ $w l^2/9\sqrt{3}$
3. ✖ $w l^2/\sqrt{3}$
4. ✖ $w l^2/2\sqrt{3}$

Question Number : 16 Question Id : 166 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The magnitude of fixed end moment for a span if one of the support sinks by δ is

Options :

1. ☒ $6EI \delta / L^2$
2. ☐ $3EI \delta / L^2$
3. ☐ $12EI \delta / L^2$
4. ☐ $EI \delta / 6L^2$

Question Number : 17 Question Id : 167 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For an eccentric load on a circular section, not to cause any tension in it, the eccentricity of loading should not exceed

Options :

1. ☐ $d/3$
2. ☐ $d/4$
3. ☐ $d/6$
4. ☒ $d/8$

Question Number : 18 Question Id : 168 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A spherical ball of volume 10^6 mm^3 is subjected to a hydrostatic pressure of 90 Mpa. If the bulk modulus for the material is 180 kN/m^2 , the change in the volume of the ball is

Options :

1. ☐ 50 mm^3
2. ☐ 100 mm^3
3. ☐ 250 mm^3
4. ☒ 500 mm^3

Question Number : 19 Question Id : 169 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For a column of length 'L', fixed at both ends, and flexural rigidity EI, the critical load is given by

Options :

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

3. ☐ $\frac{2\pi^2 EI}{L^2}$

4. ☒ $\frac{4\pi^2 EI}{L^2}$

Question Number : 20 Question Id : 170 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The deflection at any point of a perfect frame can be obtained by applying a unit load at the joint in

Options :

1. ☐ vertical direction
2. ☐ horizontal direction
3. ☐ Inclined direction
4. ☒ the direction in which deflection is required

Question Number : 21 Question Id : 171 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A cantilever beam of 3 m long carries a point load of 5 kN at its free end and 5 kN at its middle. The bending moment at the middle of the cantilever beam is

Options :

1. ☐ 22.5 kN-metre
2. ☐ 30.0 kN-metre
3. ☐ 15.0 kN-metre
4. ☒ 7.5 kN-metre

Question Number : 22 Question Id : 172 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

When the body is subjected to three mutually perpendicular stresses of equal intensity, the ratio of direct stress to the corresponding volumetric strain is known as

Options :

1. ☐ modulus of elasticity
2. ☐ modulus of rigidity
3. ☒ bulk modulus
4. ☐ Poisson's ratio

Question Number : 23 Question Id : 173 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which one of the following pairs is not correctly matched?

Options :

1. ☐ Lamé's constant : Thick cylinder
2. ☐ Macaulay's method : Deflection of beams
3. ☐ Euler's method : Theory of columns
4. ☒ Eddy's theorem : Torsion of shafts

Question Number : 24 Question Id : 174 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A simply supported beam of span 'l' carries a unit load at its centre. The strain energy in the beam is (with usual notations)

Options :

1. ☒ $L^3/96EI$

2. ☐ $L^3/48EI$

3. ☐ $L^3/192EI$

4. ☐ $L^2/96EI$

Question Number : 25 Question Id : 175 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The moment required to rotate the near end of a prismatic beam through unit angle, without translation, the far end being fixed is (with usual notations)

Options :

1. ☐ EI/L

2. ☐ $2EI/L$

3. ☐ $3EI/L$

4. ☒ $4EI/L$

Question Number : 26 Question Id : 176 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A simply supported beam which carries a uniformly distributed load has two equal overhangs. To have maximum B.M. produced in the beam the least possible, the ratio of the length of the overhang to the total length of the beam is

Options :

1. ☒ 0.207

2. ☐ 0.508

3. ☐ 0.407

4. ☐ 0.307

Question Number : 27 Question Id : 177 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A plane carrying normal stress accompanied by no shear stress is called

Options :

1. ☐ plane of no shear stress

2. ☒ principal plane

3. ☐ normal plane

4. ☐ shear plane

Question Number : 28 Question Id : 178 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The ratio of strengths of solid to hollow shafts, both having outside diameter 'D' and hollow having inside diameter 'D/2', in torsion, is

Options :

1. ☐ $1/16$

2. ☐ $1/4$

3. ✖ 1/2
4. ✖ 15/16

Question Number : 29 Question Id : 179 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A single-bay, single-storeyed portal frame ABCD has its column ends fixed. If axial deformation is neglected, the kinematic indeterminacy is

Options :

1. ✖ 3
2. ✖ 2
3. ✖ 6
4. ✖ 4

Question Number : 30 Question Id : 180 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The maximum bending moment under a particular point load among a train of point loads crossing a simply supported girder occurs at the location when that load is at

Options :

1. ✖ at mid span
2. ✖ so placed that load point and the C.G of the train of loads coincides
3. ✖ at one-quarter span
4. ✖ so placed that load point and the C.G of the train of loads equi-distant from the mid span.

Question Number : 31 Question Id : 181 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Elongation produced due to self weight in a bar of uniform cross sectional area 'A', length 'l', and weight 'W' having modulus of elasticity 'E', hung vertically at top end is

Options :

1. ✖ $\frac{2Wl}{AE}$
2. ✖ $\frac{2WA}{El}$
3. ✖ $\frac{Wl}{2AE}$
4. ✖ $\frac{Wl}{4AE}$

Question Number : 32 Question Id : 182 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The point of contra flexure in a laterally loaded beam occurs where:

Options :

1. ✖ shear force changes its sign
2. ✖ shear force is minimum
3. ✖ shear force is maximum
4. ✖ bending moment changes its sign

Question Number : 33 Question Id : 183 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Reaction at the level of prop at free end of a cantilever of span 'l' carrying a u.d.l. of 'W' per unit length is

Options :

1. ☐ $\frac{Wl}{8}$

2. ☐ $\frac{Wl}{4}$

3. ☒ $\frac{3Wl}{8}$

4. ☐ $\frac{5Wl}{8}$

Question Number : 34 Question Id : 184 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Stress variation across the wall thickness of a thick cylinder is computed by using

Options :

1. ☐ Castigliano theorem

2. ☐ Clapeyron theorem

3. ☐ Maxwell's theorem

4. ☒ Lames theorem

Question Number : 35 Question Id : 185 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The torsional rigidity of a tube of thickness 1.0 mm, diameter 200 mm, and rigidity modulus 100.0 GPa is

Options :

1. ☐ 314.1 GNmm²

2. ☐ 341.1 GNm²

3. ☐ 628.3 GNm²

4. ☒ 157.1 GNm²

Question Number : 36 Question Id : 186 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The maximum strain in the tension reinforcement in the section at failure shall not be less than (with usual notations)

Options :

1. ☒ $0.002 + (0.87 f_y / E_s)$

2. ☐ $0.0035 + (0.87 f_y / E_s)$

$$0.0035 + (f_y / 1.15 E_s)$$

3. ✖

$$0.002 + (0.85 E_s / f_y)$$

4. ✖

Question Number : 37 Question Id : 187 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Partial safety factor of the material considered for concrete is

Options :

1. ✖ 1.15

2. ✖ 2.00

3. ✖ 1.50

4. ✖ 0.87

Question Number : 38 Question Id : 188 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The maximum Deflection which can be allowed in gantry supporting manually operated crane, as per 15:800-2007 is

Options :

1. ✖ Span / 500

2. ✖ Span / 550

3. ✖ Span / 700

4. ✖ Span / 750

Question Number : 39 Question Id : 189 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The main function of Column base is to

Options :

1. ✖ transmit the Column load to foundation block

2. ✖ resist the Deflections

3. ✖ resist lateral forces

4. ✖ reduce the effect of vibrations

Question Number : 40 Question Id : 190 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The members carrying compressive forces in a roof truss are called

Options :

1. ✖ Girders

2. ✖ Ties

3. ✖ Struts

4. ✖ Purlins

Question Number : 41 Question Id : 191 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Battens provided for a compression member shall be designed to carry transverse shear equal to

Options :

1. ✖ 2.5% of axial force in member

2. ✖ 5% of axial force in member
3. ✖ 10% of axial force in member
4. ✖ 25% of axial force in member

Question Number : 42 Question Id : 192 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

For a singly reinforced over-reinforced section

1. the lever arm will be less than for a balanced section,
 2. the maximum stress developed in concrete would be equal to the allowable stress,
 3. the maximum stress developed in steel would be equal to the allowed stress.
- Of these statements the correct ones are

Options :

1. ✖ 1 and 3
2. ✖ 1 and 2
3. ✖ 2 and 3
4. ✖ 1, 2 and 3

Question Number : 43 Question Id : 193 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The effective length of a circular electrical pole of length 'l' and constant diameter erected on ground is, where 'l' is un supported length

Options :

1. ✖ $0.8 l$
2. ✖ $1.2 l$
3. ✖ $1.5 l$
4. ✖ $2.0 l$

Question Number : 44 Question Id : 194 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

When the column is effectively held in position and restrained against rotation at one end and at other end is neither held in position nor restrained against rotation, the effective length of column is 'k' times the unsupported length (L) of the column, where 'k' is equal to

Options :

1. ✖ 1.2
2. ✖ 2.0
3. ✖ 1.5
4. ✖ 0.8

Question Number : 45 Question Id : 195 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Match list 1 (column base) with list 2 (its application) and select correct answers using the code given below

List 1

- A) Grillage foundation
- B) Gusseted base
- C) Slab base

List 2

- 1) Lightly axial loaded steel column
- 2) Heavy loaded steel column to be rested on weak soils
- 3) Eccentric loaded steel column

Options :

- 1. ☐ A-1, B-2, C-3
- 2. ☐ A-3, B-2, C-1
- 3. ☒ A-2, B-3, C-1
- 4. ☐ A-2, B-1, C-3

Question Number : 46 Question Id : 196 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which one of the sections is the most efficient for a simply supported gantry girder?

Options :

- 1. ☐ I - section with equal flanges
- 2. ☒ I - section with a channel attached to the top flange
- 3. ☐ I - section with a wide bottom flange
- 4. ☐ I - section with a heavy plate connected to the bottom flange

Question Number : 47 Question Id : 197 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The unit weight of Reinforced concrete made with sand and gravel or crushed natural stone aggregate may be taken as (in kN/m^3)

Options :

- 1. ☐ 20
- 2. ☐ 23
- 3. ☐ 24
- 4. ☒ 25

Question Number : 48 Question Id : 198 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In an Isolated footing, when $e > L/6$ soil pressure at the base of farther edge from loading point is (with usual notations)

Options :

- 1. ☐ Infinity
- 2. ☐ Zero
- 3. ☐ Compressive in Nature

4. ✖ Tensile in Nature

Question Number : 49 Question Id : 199 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which one of the following is the most critical set for consideration in the design of rolled steel column carrying axial loads?

Options :

1. ✖ percent elongation at yield and net sectional area
2. ✖ critical bending strength and axial yield strength of the material
3. ✖ buckling strength based on the net area of the section and percent elongation at ultimate load
4. ✔ compressive strength based on slenderness ratio and gross sectional area of the section

Question Number : 50 Question Id : 200 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Match list 1 with list 2 and select correct answer

List 1 (Type of stress)

- A) Bending stress,
- B) Bearing stress,
- C) Maximum shear stress,

List 2 (permissible stress)

- 1) $0.40 f_y$,
- 2) $0.45 f_y$,
- 3) $0.66 f_y$,
- 4) $0.75 f_y$

Options :

1. ✖ A-3, B-1, C-2
2. ✖ A-1, B-4, C-3
3. ✔ A-3, B-4, C-2
4. ✖ A-2, B-1, C-3

Question Number : 51 Question Id : 201 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Compared to mild steel plain bars, high yield strength deformed bars are?

Options :

1. ✔ Less ductile but more strong
2. ✖ More ductile but less strong
3. ✖ More ductile and more strong
4. ✖ Less ductile and less strong

Question Number : 52 Question Id : 202 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Consider the following statements regarding the working stress design of under reinforced R.C. Section.

1. The N.A. Depth will be $>$ that of balance section,
2. Stress in steel in tension will reach its maximum permissible value,
3. The M.R. Will be $<$ that of balanced section,
4. The concrete on tension side is also to be considered for calculating the M.R. of section.

Of these statements

Options :

1. ☐ 1 & 2 are correct
2. ☐ 1 & 4 are correct
3. ☐ 3 & 4 are correct
4. ☒ 2 & 3 are correct

Question Number : 53 Question Id : 203 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A T-beam behaves as a rectangular beam of width equal to its flange if its 'NA' ?

Options :

1. ☐ coincides with centroid of reinforcement
2. ☐ coincides with centroid of T-Section
3. ☒ remains with in the flange
4. ☐ remains in the web

Question Number : 54 Question Id : 204 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

In case of a isolated square concrete footing, match the location at which the stress resultant are to be checked?

Stress resultant

- P. Bending moment
- Q. One way shear
- R. Punching shear

Location

1. at the face of column
2. at $d/2$ from face of column
3. at d from face of column

Options :

1. ☒ P-1, Q-2, R-2
2. ☐ P-3, Q-1, R-2
3. ☐ P-1, Q-3, R-2
4. ☐ P-1, Q-2, R-3

Question Number : 55 Question Id : 205 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Match the list 1 with list 2 and using the codes given below

List-1

- P. Flexure,
- Q. Shear,
- R. bond,
- S. Deflection

List-2

1. Minimum depth of section,
2. Longitudinal steel reinforcement,
3. Stirrups,
4. Anchorage in support

Options :

1. ✖ P-3, Q-2, R-1, S-4
2. ✖ P-2, Q-2, R-1, S-4
3. ✖ P-3, Q-2, R-4, S-1
4. ✖ P-2, Q-3, R-4, S-1

Question Number : 56 Question Id : 206 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A two dimensional flow is described by velocity components $u = 2x$ and $v = -2y$. The discharge between the points (1,1) and (2,2) is equal to

Options :

1. ✖ 9 units
2. ✖ 8 units
3. ✖ 7 units
4. ✖ 6 units

Question Number : 57 Question Id : 207 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In a rectangular channel, the critical depth is given by

Options :

1. ✖ $\left(\frac{q^2}{g}\right)^{1/2}$
2. ✖ $\left(\frac{q^2}{g}\right)^{1/3}$
3. ✖ $\left(\frac{q^2}{g}\right)^{1/4}$
4. ✖ $\left(\frac{q^3}{g}\right)^{1/3}$

Question Number : 58 Question Id : 208 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A Differential manometer measures

Options :

1. ✖ absolute pressure at a point
2. ✖ local atmospheric pressure
3. ✖ difference in total energy between two points
4. ✖ difference in pressure between two points

Question Number : 59 Question Id : 209 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The condition of "No slip" at rigid boundaries is applicable to

Options :

1. ✖ Flow of Newtonian fluids only
2. ✖ Flow of ideal fluids only

3. ☒ Flow of all read fluids
4. ☒ Flow of all non-Newtonian fluids

Question Number : 60 Question Id : 210 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The Bernoulli's equation is written with usual notation as $p/w + v^2/2g + z = \text{constant}$. In this equation each of the terms represents

Options :

1. ☒ energy in Kg.m/Kg mass of fluid
2. ☒ energy in N.m/Kg mass of fluid
3. ☒ energy in N.m/N weight of fluid
4. ☒ power in kw/Kg mass of fluid

Question Number : 61 Question Id : 211 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Pitot tube is used for measurement of

Options :

1. ☒ low pressures
2. ☒ flow of ideal fluids only
3. ☒ velocity at a point
4. ☒ discharge

Question Number : 62 Question Id : 212 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The lift force on a body is

Options :

1. ☒ due to buoyant force
2. ☒ the component of the resultant force in the vertical direction
3. ☒ the component of the resultant force in a direction normal to relative velocity
4. ☒ due to drag on the body

Question Number : 63 Question Id : 213 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

The difference between the total head line and the hydraulic grade line represents :

Options :

1. ☒ the velocity head
2. ☒ the piezometric head
3. ☒ the pressure head
4. ☒ the elevation head

Question Number : 64 Question Id : 214 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

A water jet 0.015 m^2 in area has a velocity of 15 m/s .
 If this jet impinges normally on a plate which is
 moving at a velocity of 5 m/s in the direction of the
 jet, the force on the plate due to this impact is :

Options :

1. ☐ 3368 N
2. ☐ 2246 N
3. ☒ 1497 N
4. ☐ 14686 N

Question Number : 65 Question Id : 215 Question Type : MCQ Option Shuffling : No
 Correct : 2.0 Wrong : 0.0

Which of the following is not a dimension-less number:

Options :

1. ☐ Darcy- Weisbach friction factor f
2. ☐ Coefficient of drag C_D
3. ☒ Manning's coefficient n
4. ☐ Coefficient of Velocity C_v

Question Number : 66 Question Id : 216 Question Type : MCQ Option Shuffling : No
 Correct : 2.0 Wrong : 0.0

In a laminar flow between two parallel plates with a separation distance of 6 mm , the centre line Velocity is 1.8 m/s . The velocity at a distance of 1 mm from the boundary is:

Options :

1. ☐ 0.15 m/s
2. ☒ 1.0 m/s
3. ☐ 0.55 m/s
4. ☐ 0.75 m/s

Question Number : 67 Question Id : 217 Question Type : MCQ Option Shuffling : No
 Correct : 2.0 Wrong : 0.0

A laminar boundary layer has a velocity distribution given by $u/U = y/\delta$. The displacement thickness δ^* for this boundary layer is:
 (with usual notations)

Options :

1. ☐ δ
2. ☒ $\delta/2$
3. ☐ $\delta/4$
4. ☐ $\delta/6$

Question Number : 68 Question Id : 218 Question Type : MCQ Option Shuffling : No
 Correct : 2.0 Wrong : 0.0

In a hydraulic jump occurring in a horizontal rectangular channel the sequent depths are 0.25 m & 1.25 m. The energy loss in this jump is :

Options :

1. ☒ 0.25 m
2. ☐ 1.0m
3. ☐ 1.25m
4. ☐ 1.50m

Question Number : 69 Question Id : 219 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The frictional resistance of a pipe varies approximately with the ___ of the liquid

Options :

1. ☐ pressure
2. ☐ velocity
3. ☒ square of velocity
4. ☐ cube of velocity

Question Number : 70 Question Id : 220 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For subsonic-flow, if the area of flow increases:

Options :

1. ☐ velocity is constant
2. ☐ velocity increases
3. ☒ velocity decreases
4. ☐ velocity is infinity

Question Number : 71 Question Id : 221 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The equation of motion for laminar flow of a real fluid is known as

Options :

1. ☐ Euler's equation
2. ☐ Bernoulli's equation
3. ☒ Navier-Stokes equation
4. ☐ Reynold's equation

Question Number : 72 Question Id : 222 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The notch angle for maximum discharge over a triangular notch is

Options :

1. ☐ 30°
2. ☐ 60°
3. ☒ 90°
4. ☐ 120°

Question Number : 73 Question Id : 223 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Square root of the ratio of inertia force of flowing fluid to the gravity force is

Options :

1. ☐ Mach number
2. ☒ Weber number
3. ☐ Froude's number
4. ☐ Euler's number

Question Number : 74 Question Id : 224 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A centrifugal pump was manufactured to couple directly to a 15 HP electric motor running at 1500 rpm, delivering 50 lit./min. against a total head of 36 m. It is desired to replace the motor by a diesel engine with 1000 rpm and couple it directly to the pump. The head developed by the pump is likely to be

Options :

1. ☐ 41.4 m
2. ☐ 29.6 m
3. ☐ 20 m
4. ☒ 16 m

Question Number : 75 Question Id : 225 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A fluid (specific gravity = 0.9 and $\mu = 1.2$ Pa.s) flows in a laminar regime between two parallel plates fixed 3 cm apart. If the discharge is $600 \text{ cm}^3/\text{s}/\text{cm}$ width of plate, the shear stress on the boundary, in Pa, is

Options :

1. ☐ 800
2. ☐ 640
3. ☒ 480
4. ☐ 240

Question Number : 76 Question Id : 226 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In the laminar flow of a liquid down an inclined plane, the surface velocity is found to be 30 cm/s. The average velocity of the flow, in cm/s is

Options :

1. ☒ 20
2. ☐ 30
3. ☐ 15
4. ☐ 10

Question Number : 77 Question Id : 227 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The thickness of laminar sub layer 'd' is given by (with usual notations)

Options :

1. ☐ $11.6u_*/v$
2. ☐ $u_*/(11.6v)$
3. ☒ $11.6v/u_*$
4. ☐ v/u_*

Question Number : 78 Question Id : 228 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In Isentropic flow between two points, the stagnation

Options :

1. ☐ pressure and stagnation temperature may vary
2. ☐ pressure would decrease in the direction of the flow
3. ☐ pressure and stagnation temperature would decrease with an increase in velocity
4. ☒ pressure, stagnation temperature and stagnation density would remain constant throughout the flow

Question Number : 79 Question Id : 229 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The ratio of power output of the pump to the power input to the pump is known as

Options :

1. ☐ mechanical efficiency
2. ☒ overall efficiency
3. ☐ manometric efficiency
4. ☐ Pump efficiency

Question Number : 80 Question Id : 230 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The relationship between specific gravity of soil (S), Field capacity (FC) and Permanent wilting point (PWP) exists to compute available water for plant per meter depth is

Options :

1. ☐ $AW = S - FC - PWP$
2. ☒ $AW = S[FC - PWP]$
3. ☐ $AW = S[PWP - FC]$
4. ☐ Relationship does not exist

Question Number : 81 Question Id : 231 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The observed runoff during 6 h storm with a uniform intensity of 15mm/h over a basin of area 300 km^2 is 21.6 million m^3 . The average infiltration rate during the storm is

Options :

- 1. ☒ 3 mm/h
- 2. ☐ 6 mm/h
- 3. ☐ 12 mm/h
- 4. ☐ 18 mm/h

Question Number : 82 Question Id : 232 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The upper limit on the area of the basin for the applicability of unit hydrograph is taken to be

Options :

- 1. ☐ 100 km^2
- 2. ☐ 2500 km^2
- 3. ☒ 5000 km^2
- 4. ☐ 10000 km^2

Question Number : 83 Question Id : 233 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A 4-hour unit hydrograph of a drainage basin is triangular in form with a height of $50 \text{ m}^3/\text{s}$ and a base of 15 hours. The area in km^2 of the drainage basin is

Options :

- 1. ☐ 110
- 2. ☒ 135
- 3. ☐ 147
- 4. ☐ 151

Question Number : 84 Question Id : 234 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For an annual flood series arranged in decreasing order of magnitude, the return period for a magnitude listed at position m in a total of N entries is

Options :

1. ☐ m/N
2. ☐ $m/(N+1)$
3. ☒ $(N+1)/m$
4. ☐ $N/(m+1)$

Question Number : 85 Question Id : 235 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The shape of the phreatic line is

Options :

1. ☒ Parabola
2. ☐ Straight line
3. ☐ Cylindrical
4. ☐ Circular

Question Number : 86 Question Id : 236 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

If the regime velocity of flow in a Lacey's channel having hydraulic mean radius of 1 m is 0.4 m/s, the silt factor is

Options :

1. ☐ 0.5
2. ☐ 0.6
3. ☒ 0.4
4. ☐ 0.7

Question Number : 87 Question Id : 237 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A drainage basin is

Options :

1. ☐ The length of long river
2. ☐ A lake or ocean into which river drains
3. ☐ The lower level a river erodes
4. ☒ Total area drained by river and its tributaries

Question Number : 88 Question Id : 238 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Isohyet is a line joining points having

Options :

1. ☐ Equal evaporation rate
2. ☐ Equal Barometric pressure
3. ☐ Equal height above MSL
4. ☒ Equal rainfall depth of given duration

Question Number : 89 Question Id : 239 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A unit Hydrograph has

Options :

1. ☐ One unit of peak discharge
2. ☐ One unit of rainfall duration
3. ☒ One unit of direct run off
4. ☐ One unit of time base of direct run off

Question Number : 90 Question Id : 240 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In a sedimentation tank (length L, width B, depth D) the settling Velocity of a particle for a discharge Q_s is

Options :

1. ☐ Q_s/BD
2. ☐ Q_s/LD
3. ☐ Q_s/L
4. ☒ Q_s/BL

Question Number : 91 Question Id : 241 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

When chlorine is added beyond the break-point the process of treating the water is known as

Options :

1. ☐ Plain chlorination
2. ☒ Super chlorination
3. ☐ Post chlorination
4. ☐ Dechlorination

Question Number : 92 Question Id : 242 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A waste water sample of 2 ml is made upto 300 ml in BOD bottle with distilled water. Initial DO of the sample is 8 mg/l and after 5 days it is 2 mg/l, its BOD is

Options :

1. ☐ 894 mg/l
2. ☒ 900 mg/l
3. ☐ 300 mg/l
4. ☐ 1200 mg/l

Question Number : 93 Question Id : 243 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The detention period of a septic tank is of the order of

Options :

1. ☐ 2 - 6 hours
2. ☐ 2 - 4 hours
3. ☒ 12 - 36 hours
4. ☐ 4 - 8 hours

Question Number : 94 Question Id : 244 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The value of ϕ -index (phi index) for any basin area represents

Options :

1. ☐ separates the value of Rainfall and Runoff in a year
2. ☐ the depth of runoff at a basin
3. ☐ the depth of rainfall in a basin
4. ☒ a value that separates runoff and rainfall intensity for a particular storm

Question Number : 95 Question Id : 245 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which of the option is hygroscopic water

Options :

1. ☐ Water which represents the majority available for plant uptake
2. ☒ Water held tightly as film around individual soil particles and unavailable to plant
3. ☐ Water which ponds up on soil surface
4. ☐ Water which is available to drain through soil by gravity

Question Number : 96 Question Id : 246 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The duty of crop is 1500 hectares in base period is 120 days. The delta of crop is

Options :

1. ☒ 690 mm
2. ☐ 860 mm
3. ☐ 1100 mm
4. ☐ 1000 mm

Question Number : 97 Question Id : 247 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A flood wave in a river is an example of

Options :

1. ☐ steady, non-uniform flow
2. ☒ unsteady, gradually varied flow
3. ☐ steady, spatially varied flow
4. ☐ unsteady, rapidly varied flow

Question Number : 98 Question Id : 248 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Seepage through earthen dam can be computed by the following equation (with usual notations)

Options :

1. ☐ $q = Kh[N_d \times N_f]$
2. ☐ $q = Kh \left[\frac{N_d}{N_f} \right]$
3. ☐ $q = KH \sqrt{(N_f / N_d)}$
4. ☒ $q = Kh[N_f / N_d]$

Question Number : 99 Question Id : 249 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Lacey's concept of design of canals is based on the

Options :

1. ☐ lined channels
2. ☒ unlined channels only
3. ☐ both lined and unlined channels
4. ☐ neither lined nor unlined channels

Question Number : 100 Question Id : 250 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Under normal conditions of load and when reservoir is full, the critical stress will be acting on dam at

Options :

1. ☒ Toe
2. ☐ Heel
3. ☐ Middle third
4. ☐ Centre

Question Number : 101 Question Id : 251 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The rate of settling of a particle depends upon the

Options :

1. ☐ viscosity of water
2. ☐ specific gravity of particle
3. ☐ shape and size of particle
4. ☒ viscosity of water, specific gravity and shape and size of particles

Question Number : 102 Question Id : 252 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

During temperature inversion in atmosphere, air pollutants tend to

Options :

1. ☐ accumulate above inversion layer
2. ☐ accumulate below inversion layer
3. ☐ disperse laterally
4. ☒ disperse vertically

Question Number : 103 Question Id : 253 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A pollutant undergoes self purification in four distinct zones

1. Zone of clear water
2. Zone of active decomposition
3. Zone of degradation
4. Zone of recovery

The correct sequence of these zones is

Options :

1. ☐ 4,3,2,1
2. ☐ 2,3,4,1

3. ✖ 2,4,3,1

4. ✖ 3,2,4,1

Question Number : 104 Question Id : 254 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Activated carbon is used to remove

Options :

1. ✖ Odour and taste
2. ✖ Hardness
3. ✖ Iron and manganese
4. ✖ Dissolved salts

Question Number : 105 Question Id : 255 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The main constituents of gas generated during anaerobic digestion of sewage sludge are

Options :

1. ✖ CO_2 and CH_4
2. ✖ CH_4 and Ethane
3. ✖ CO_2 and CO
4. ✖ CO_2 and N_2

Question Number : 106 Question Id : 256 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Uplift pressure is considered in the analysis of gravity dams

Options :

1. ✖ Only when there is a drainage gallery in the dam
2. ✖ Only when there is tail water
3. ✖ Only where the reservoir is empty
4. ✖ In all situations having water in the reservoir

Question Number : 107 Question Id : 257 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

According to Khosla's theory, the undermining of the floor starts from the

Options :

1. ✖ Tail end
2. ✖ Starting end
3. ✖ Intermediate point
4. ✖ Foundation bed

Question Number : 108 Question Id : 258 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A stream is discharging 400 cusecs of water and has a fall of 50m. The power potential of the hydel station would be

Options :

1. ☒ $1.962 \times 10^5 \text{ KW}$
2. ☐ $19.62 \times 10^5 \text{ KW}$
3. ☐ 1962 KW
4. ☐ $2.616 \times 10^5 \text{ KW}$

Question Number : 109 Question Id : 259 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which formula is used to measure velocity of water in water supply main

Options :

1. ☒ Hazen Williams
2. ☐ Manning's
3. ☐ Chezy's
4. ☐ Kutters

Question Number : 110 Question Id : 260 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Acid rain is because of

Options :

1. ☒ SO_x
2. ☐ CO_x
3. ☐ COH
4. ☐ H_2S

Question Number : 111 Question Id : 261 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The Tie bars in cement concrete pavements are provided across

Options :

1. ☒ Longitudinal joint
2. ☐ Expansion joint
3. ☐ Contraction joint
4. ☐ Warping joint

Question Number : 112 Question Id : 262 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In general, the drainage layer facility is provided in which layer of the pavement

Options :

1. ☐ sub-grade

2. ☒ sub-base
3. ☒ base course
4. ☒ wearing course

Question Number : 113 Question Id : 263 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In Indian Railways preferable sleeper density is normally kept as (M being rail length in metres)

Options :

1. ☒ $M + 2$ to $M+10$
2. ☒ $M+2$ to $M+7$
3. ☒ $M+5$ to $M+10$
4. ☒ $M+2$ to $M+5$

Question Number : 114 Question Id : 264 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A Central Government, semi-official technical body known as Indian Roads Congress (IRC) was formed in the year

Options :

1. ☒ 1943
2. ☒ 1929
3. ☒ 1950
4. ☒ 1934

Question Number : 115 Question Id : 265 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

What is the off-tracking while negotiating a horizontal curve on two lane highway with a mean radius of 30m (take length of wheel base is 6m)

Options :

1. ☒ 0.66 m
2. ☒ 1.0 m
3. ☒ 0.75 m
4. ☒ 1.20 m

Question Number : 116 Question Id : 266 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Desire lines are plotted for these surveys

Options :

1. ☒ Origin & destination
2. ☒ Volume
3. ☒ Speed
4. ☒ Accident

Question Number : 117 Question Id : 267 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The following formula is used to calculate the Equivalent Axle load Factor (EALF) for single axle load (Kg) in vehicle damage factor analysis

Options :

1. ☒ $EALF = (\text{axle load}/8760)^4$

2. ✖ $EALF = (\text{axle load}/8160)^4$

3. ✖ $EALF = (\text{axle load}/14968)^4$

4. ✖ $EALF = (\text{axle load}/5100)^4$

Question Number : 118 Question Id : 268 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The composite sleeper index evolved is from a combination of these properties

Options :

1. ✖ Strength and toughness
2. ✖ Toughness and wear resistance
3. ✖ Strength and Hardness
4. ✖ Toughness and shear resistance

Question Number : 119 Question Id : 269 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The shape of transition curve suitable for highways as per IRC is

Options :

1. ✖ Spiral
2. ✖ Lemniscate
3. ✖ Cubic parabola
4. ✖ parabola

Question Number : 120 Question Id : 270 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Find the compensated gradient at a horizontal curve of radius 50m with a hill road having ruling gradient of 5 percent is

Options :

1. ✖ 3.5%
2. ✖ 4.75%
3. ✖ 3.25%
4. ✖ 4.25%

Question Number : 121 Question Id : 271 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which is useful in estimation of highway user revenues, computation of accident rate, establishment of volume trends

Options :

1. ✖ Average Annual Daily Traffic (AADT)
2. ✖ Average Daily Traffic (ADT)
3. ✖ Average Weekday Traffic (AWT)
4. ✖ Peak Hour Traffic Volume (PHTV)

Question Number : 122 Question Id : 272 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The maximum allowable width of any vehicle as per Indian Roads Congress

Options :

1. ✖ 3.5 m
2. ✖ 3.75 m
3. ✔ 2.50 m
4. ✖ 3.80 m

Question Number : 123 Question Id : 273 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The relation between fatigue life and stress ratio (SR) (when $0.45 \leq SR \leq 0.55$) is given to compute number of repetitions of axle loads

Options :

1. ✖ $N = \left[\frac{4.2577}{SR - 0.5325} \right]^{3.268}$
2. ✖ $N = \left[\frac{5.2577}{SR - 0.4325} \right]^{3.268}$
3. ✖ $N = \left[\frac{4.2577}{SR - 0.3325} \right]^{3.268}$
4. ✔ $N = \left[\frac{4.2577}{SR - 0.4325} \right]^{3.268}$

Question Number : 124 Question Id : 274 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The maximum values of cant deficiency for Broad Gauge and Meter Gauge prescribed by Indian Railways is

Options :

1. ✔ BG=75mm & MG = 50mm
2. ✖ BG=77mm & MG=40mm
3. ✖ BG=50mm & MG=40mm
4. ✖ BG=75mm & MG = 60mm

Question Number : 125 Question Id : 275 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

As per ICAO, the combined correction for an elevation and temperature should not exceed for runway design

Options :

1. ✖ 45 percent
2. ✔ 35 percent
3. ✖ 25 percent
4. ✖ 7 percent

Question Number : 126 Question Id : 276 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

What is the effect of increasing the compaction energy on compaction characteristics of a given soil. (with usual notation)

Options :

1. ✖ decreases MDD, increases OMC
2. ✔ decreases OMC, increases MDD
3. ✖ Increases OMC and MDD
4. ✖ decreases OMC & MDD

Question Number : 127 Question Id : 277 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The "square root of time" fitting method is used to determine

Options :

1. ☐ compression Index (C_c)
2. ☒ coefficient of consolidation (C_v)
3. ☐ coefficient of volume change (m_v)
4. ☐ time factor (T_v)

Question Number : 128 Question Id : 278 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In a UU Triaxial compression test on a $\phi = 0$ soil, failure was observed at a deviatoric stress of 60 kN/m^2 under a confining stress 50 kN/m^2 of the confining stress is increased to 100 kN/m^2 , the deviatoric stress at failure is

Options :

1. ☐ 60 kN/m^2
2. ☐ 110 kN/m^2
3. ☒ 120 kN/m^2
4. ☐ 160 kN/m^2

Question Number : 129 Question Id : 279 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which roller is most suitable for the compaction of a gravelly sand mixture with 25% fines?

Options :

1. ☒ Smooth-wheeled roller
2. ☐ Sheepfoot roller
3. ☐ Vibrating roller
4. ☐ Heavy roller

Question Number : 130 Question Id : 280 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Clover leaf cofferdam belongs to

Options :

1. ☐ braced type
2. ☒ cellular type
3. ☐ sheet pile type
4. ☐ diaphragm type

Question Number : 131 Question Id : 281 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

What is the maximum value of water table correction factor in predicting bearing pressure based on Meyerhof's theory

Options :

1. ☐ 0.5
2. ☐ 0.75
3. ☐ 1.0
4. ☒ Not considered

Question Number : 132 Question Id : 282 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The effect of cohesion on the active and passive earth pressures is that

Options :

1. ☐ Both increase
2. ☐ Both decrease
3. ☐ Active earth pressure increases and passive earth pressure decreases
4. ☒ Active earth pressure decreases and passive earth pressure increases

Question Number : 133 Question Id : 283 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

In Terzaghi's theory of bearing capacity of shallow foundation, which of the following zones is assumed to act as if it were part of the following

Options :

1. ☐ Zone of linear shear
2. ☐ Zone of radial shear
3. ☒ Zone of elastic equilibrium
4. ☐ Overburden Zone

Question Number : 134 Question Id : 284 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which of the following type of sampler is preferred to collect an undisturbed sample (UDS) in cohesionless soils

Options :

1. ☐ thin wall tube samplers
2. ☐ split spoon samplers
3. ☒ piston samplers
4. ☐ augers

Question Number : 135 Question Id : 285 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Expansive soils are those which generally consists of

Options :

1. ☐ silica
2. ☐ feldspar
3. ☐ Mica
4. ☒ Montmorillonite

Question Number : 136 Question Id : 286 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

For a clay, $SL=20\%$, $PL=40\%$.

The total volume at PL & LL

was $1.20 V_d$ and $1.50 V_d$

respectively wherein V_d = dry

volume. Then, the plasticity

Index PI of the soil is

Options :

1. ☐ 10
2. ☐ 20
3. ☒ 30
4. ☐ 40

Question Number : 137 Question Id : 287 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The time required for a

consolidating medium with

double drainage to undergo

50% of its primary

consolidation time was

estimated as 8 years. All other

conditions remaining same,

estimate the time required if

the medium has single

drainage boundary

Options :

1. ☐ 4 years
2. ☐ 8 years
3. ☐ 16 years
4. ☒ 32 years

Question Number : 138 Question Id : 288 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The coefficient of earth pressure in "At rest" condition is given by (with usual notations)

Options :

1. ☐ $k_0 = \frac{1 - \sin \theta}{1 + \sin \theta}$

2. ☐ $k_0 = \frac{1 + \sin \theta}{1 - \sin \theta}$

3. ☒ $k_0 = \frac{\mu}{1 - \mu}$

4. ☐ $k_0 = \frac{1 + \cos \theta}{1 - \cos \theta}$

Question Number : 139 Question Id : 289 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Calculate coefficient of permeability in m/sec, if the coefficient of consolidation and volume change are $4.8 \text{ mm}^2/\text{min.}$ and $1.02 \times 10^{-3} \text{ m}^2/\text{kN.}$

Options :

1. ☐ 4.8×10^{-8}

2. ☒ 8.0×10^{-10}

3. ☐ 1.02×10^{-9}

4. ☐ 4.8×10^{-10}

Question Number : 140 Question Id : 290 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Skempton's bearing capacity theory is valid for

Options :

1. ☒ clay soils

2. ☐ silt soils

3. ☐ sandy soils

4. ☐ gravel soils

Question Number : 141 Question Id : 291 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Which one of the following is relatively more accurate estimating method for building

Options :

1. ☐ service unit
2. ☐ square meter of floor area
3. ☐ cubic meter of the building
4. ☒ elemental bill method

Question Number : 142 Question Id : 292 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

How much percentage of the estimated cost of the building works are usually provided in the estimate for electrification works

Options :

1. ☐ 10% of the estimated cost of the building
2. ☐ 5% of the estimated cost of the building
3. ☒ 8% of the estimated cost of the building
4. ☐ 12% of the estimated cost of the building

Question Number : 143 Question Id : 293 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The optimistic, most likely and pessimistic time estimates for an activity are 6, 16 and 22 days, what could be the probabilistic time estimate

Options :

1. ☒ 15.33 days
2. ☐ 30.66 days
3. ☐ 14.66 days
4. ☐ 29.33 days

Question Number : 144 Question Id : 294 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

A document containing detailed description of all the items of work together with their current rates is called

Options :

1. ☐ Analysis of rates
2. ☐ Tender
3. ☒ Schedule of Rates
4. ☐ Cubic rate estimate

Question Number : 145 Question Id : 295 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The working from whole to the part is done in surveying in order to ensure that

Options :

1. ☐ plotting is done more quickly
2. ☐ survey work is completed more quickly
3. ☒ errors and mistakes of one portion do not affect the remaining portion
4. ☐ number of errors is minimum

Question Number : 146 Question Id : 296 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Match List I with List II and select the correct answer using the codes given below from the lists.

List I

- A) Correction for sag
- B) Lease count 30'
- C) Overlap
- D) Additive Constant

List II

- 1. Tacheometer
- 2. Aerial Photograph
- 3. Base line
- 4. Prismatic compass

Options :

- 1. ☐ A-4, B-3, C-2, D-1
- 2. ☒ A-3, B-4, C-2, D-1
- 3. ☐ A-1, B-2, C-3, D-4
- 4. ☐ A-3, B-4, C-1, D-2

Question Number : 147 Question Id : 297 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Dip of the magnetic needle at magnetic poles is

Options :

- 1. ☒ 0°
- 2. ☐ 45°
- 3. ☐ 60°
- 4. ☐ 90°

Question Number : 148 Question Id : 298 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

The datum adopted for India is

Options :

- 1. ☐ MSL at Bombay
- 2. ☒ MSL at Karachi
- 3. ☐ MSL at Madras
- 4. ☐ MSL at Calcutta

Question Number : 149 Question Id : 299 Question Type : MCQ Option Shuffling : No

Correct : 2.0 Wrong : 0.0

Overturning of the vehicles on a curve can be avoided by using

Options :

- 1. ☐ Compound curve
- 2. ☒ Transition curve
- 3. ☐ Vertical curve
- 4. ☐ Reverse curve

Test

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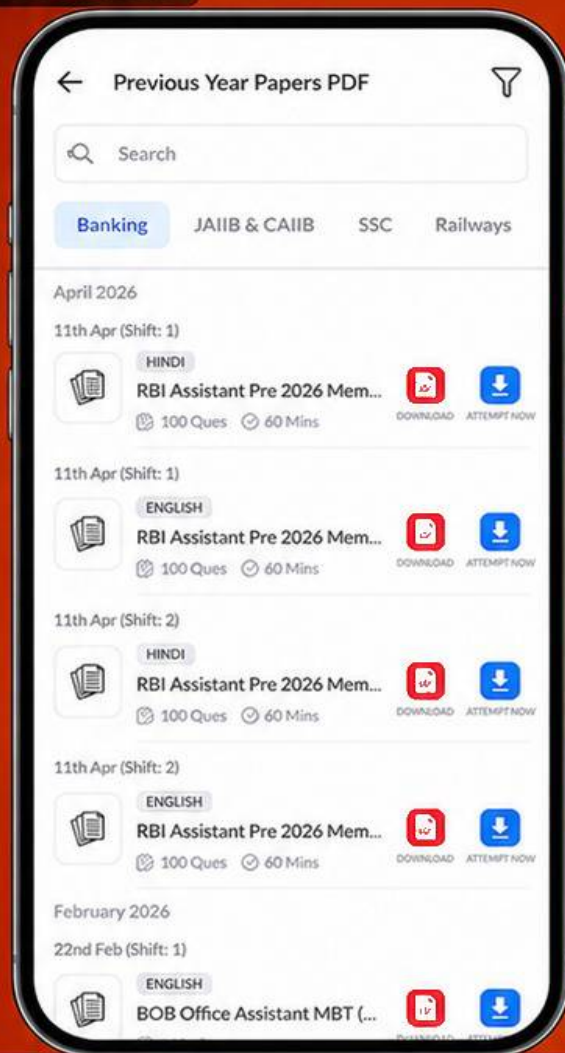
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Question Number : 150 Question Id : 300 Question Type : MCQ Option Shuffling : No
Correct : 2.0 Wrong : 0.0

Which one of the following is an obstacle to chaining but not to ranging?

Options :

1. ☒ River
2. ☐ Hill
3. ☐ Building
4. ☐ ground