National Testing Agency

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Civil Structural And Transport Engg

Section Id : 878270998

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Section Marks :	300
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Sub-Section Id :	8782701821
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 1 Question Id : 87827045301 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Modular ratio 'm' is proportional to the permissible stresses in steel and concrete. The value of 'm' according to IS:456-2000 code is (f_c= maximum permissible comperssive stress in N/mm^2):

1. $2800/3f_c$
2. $280/3f_c$
3. $2800/5f_c$
4. $280/5f_c$

Options :

878270178041. 1

878270178042. 2

878270178043. 3

878270178044. 4

Question Number : 2 Question Id : 87827045302 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For tensile strenght of concrete, when the designer wishes to use an estimate of the tensile strength from the compressive strength of concrete, the flexural strength of concete will be:

(f_{ck} is the characteristic cube compressive strength of concrete N/mm^2)

1. $0.5\sqrt{(f_{ck})}$
2. $0.6\sqrt{(f_{ck})}$
3. $0.7\sqrt{(f_{ck})}$
4. $0.8\sqrt{(f_{ck})}$

Options :

878270178045. 1

878270178046. 2

878270178047. 3

878270178048. 4

Question Number : 3 Question Id : 87827045303 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Metakaoline to be used in pozzolanic material having finess between

1. 700-900 m^2/kg
2. 500-700 m^2/kg
3. 300-500 m^2/kg
4. 100-300 m^2/kg

Options :

878270178049. 1

878270178050. 2

878270178051. 3

878270178052. 4

Question Number : 4 Question Id : 87827045304 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For design purpose, the earthquake forces shall be calculated in accordance with

1. IS 1890
2. IS 1891
3. IS 1892
4. IS 1893

Options :

878270178053. 1

878270178054. 2

878270178055. 3

878270178056. 4

Question Number : 5 Question Id : 87827045305 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In the absence of more accurate determination, the effective width of the flange (b_f) for T-Beam may be taken as:

where

l_0 = distance between points of zero moments in the beam,

b_w = breadth of the web,

D_f = thickness of flange, and

1. $b_f = (l_0/6) + b_w + 6D_f$
2. $b_f = (l_0/3) + b_w + 6D_f$
3. $b_f = (l_0/3) + b_w + 3D_f$
4. $b_f = (l_0/6) + b_w + 3D_f$

Options :

878270178057. 1

878270178058. 2

878270178059. 3

878270178060. 4

Question Number : 6 Question Id : 87827045306 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If a **cantilever** solid slab supported on two opposite edges, carries concentrated loads the maximum bending moment caused by the concentrated loads shall be assumed to be resisted by an effective width for this cantilever solid slab will be in accodance to which of the following equations:

where:

b_{ef} =effective width,

a_1 =distance of the concentrated load from the face of the cantilever support, and

a = width of contact area of the concentrated load measured parallel to the supporting edge.

1. $b_{ef} = 1.0a_1 + a$
2. $b_{ef} = 1.2a_1 + a$
3. $b_{ef} = 1.4a_1 + a$
4. $b_{ef} = 1.6a_1 + a$

Options :

878270178061. 1

878270178062. 2

878270178063. 3

878270178064. 4

Question Number : 7 Question Id : 87827045307 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Laps splices shall not be used for reinforcement bars having diameter larger than

1. 32mm
2. 34mm
3. 36mm
4. 42mm

Options :

878270178065. 1

878270178066. 2

878270178067. 3

878270178068. 4

Question Number : 8 Question Id : 87827045308 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The lever arm 'z' for a deep continuous beam shall be detemined by

where:

'L' is the effective span taken as centre to centre distance between supports or 1.15 times the clear span, whichever is smaller.

'D' is the overall depth

1. 0.2 (L+1.0D), Where L ≤ L/D ≤ 2.5
2. 0.2 (L+1.5D), Where L ≤ L/D ≤ 2.5
3. 0.2 (L+2D), Where L ≤ L/D ≤ 2.5
4. 0.2 (L+2.5D), Where L ≤ L/D ≤ 2.5

Options :

878270178069. 1

878270178070. 2

878270178071. 3

878270178072. 4

Question Number : 9 Question Id : 87827045309 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For reinforced concrete flat slab when subjected to unbalanced gravity load, wind, earthquake, or other lateral loads cause transfer of bending moment between slab and column, the flexural stresses shall be investigated using a fraction, 'α' of the moment given by

where:

a_1 = overall dimension of the critical section for shear in the direction in which moment acts

a_2 = overall dimension of the critical section for shear transverse to the direction in which moment acts

1. $\alpha = [1/\{1 + (3/2) \times \sqrt{(a_1/a_2)}\}]$
2. $\alpha = [1/\{1 + (2/3) \times \sqrt{(a_2/a_1)}\}]$
3. $\alpha = [1/\{1 + (3/2) \times \sqrt{(a_2/a_1)}\}]$
4. $\alpha = [1/\{1 + (2/3) \times \sqrt{(a_1/a_2)}\}]$

Options :

878270178073. 1

878270178074. 2

878270178075. 3

878270178076. 4

Question Number : 10 Question Id : 87827045310 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In the 'direct design method' for RCC slab total design moment for a span, the absolute sum of the positive and average negative bending moment in each direction shall be taken as:

where

M_0 =total moment;

W =design load on an area L_2

L_n = clear span extending from face to face of columns, capitals, brackets or walls, but not less than $0.65L_1$

L_1 = length of span in the direction of M_0

L_2 = length of span transverse to L_1

1. $M_0 = WL_n/8$
2. $M_0 = WL_n/6$
3. $M_0 = WL_n/4$
4. $M_0 = WL_n/2$

Options :

878270178077. 1

878270178078. 2

878270178079. 3

878270178080. 4

Question Number : 11 Question Id : 87827045311 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The ratio of effective height to thickness of the wall (H_e/t) shall not exceed

1. 10
2. 20
3. 30
4. 40

Options :

878270178081. 1

878270178082. 2

878270178083. 3

878270178084. 4

Question Number : 12 Question Id : 87827045312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For the design of horizontal shear, the nominals shear stress ζ_{vw} in walls shall be

where:

V_u = shear force due to design loads

t = wall thickness.

d = 0.8 L_w , where L_w is the length of the wall

1. $V_u/2dt$
2. V_u/dt
3. $3V_u/dt$
4. $4V_u/dt$

Options :

878270178085. 1

878270178086. 2

878270178087. 3

878270178088. 4

Question Number : 13 Question Id : 87827045313 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In the limit state design of concrete structures, the charateristic compressive strength of concrete means

1. the value of the strength of the material below which not more than 0.5 percent of the test results are expected to fall
2. the value of the strength of the material below which not more than 5 percent of the test results are expected to fall
3. the value of the strength of the material below which not more than 10 percent of the test results are expected to fall
4. the value of the strength of the material below which not more than 15 percent of the test results are expected to fall

Options :

878270178089. 1

878270178090. 2

878270178091. 3

878270178092. 4

Question Number : 14 Question Id : 87827045314 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In structure designing in limit state method,the term 'characteristic load' means that the value of the load which has _____ probability of not being exceeded during the life of the structure.

1. 92%
2. 93%
3. 94%
4. 95%

Options :

878270178093. 1

878270178094. 2

878270178095. 3

878270178096. 4

Question Number : 15 Question Id : 87827045315 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In limit state method, as per IS:456-2000, the ultimate moment of resistance provided at any section of a member is not less than _____ of the moment at that section obtained from an elastic maximum moment diagram covering all appropriate combinations of the loads.

1. 60%
2. 65%
3. 70%
4. 75%

Options :

878270178097. 1

878270178098. 2

878270178099. 3

878270178100. 4

Question Number : 16 Question Id : 87827045316 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Design for the limit state of collapse in flexure shall be based on the assumptions that the maximum strain in the tension reinforcement in the section at failure shall not be less than.................

where

f_y = characteristic strength of steel

E_s = modulus of elasticity of steel

1. $f_y/(1.15E_s) + 0.02$
2. $f_y/(1.15E_s) + 0.002$
3. $f_y/(1.14E_s) + 0.02$
4. $f_y/(1.14E_s) + 0.002$

Options :

878270178101. 1

878270178102. 2

878270178103. 3

878270178104. 4

Question Number : 17 Question Id : 87827045317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

'Code of practice for earthquake resistant design and construction of buildings' is given in which Indian Standard code

1. IS 4324: 1993
2. IS 4325: 1993
3. IS 4326: 1993
4. IS 4327: 1993

Options :

878270178105. 1

878270178106. 2

878270178107. 3

878270178108. 4

Question Number : 18 Question Id : 87827045318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Code of practice for fire safety of buildings (general): Details of construction is given in which Indian Standard code

1. IS 1642: 1989
2. IS 1643: 1989
3. IS 1644: 1989
4. IS 1645: 1989

Options :

878270178109. 1

878270178110. 2

878270178111. 3

878270178112. 4

Question Number : 19 Question Id : 87827045319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which one of the following assumptions in not correct when it is related to Load Resistance Factor Design (LRFD) of composite construction

1. Forces are calculated on the basis of effective area
2. Stiffness of the member is considered uniform
3. No slip is allowed between concrete and steel.
4. The concrete stress is 0.085 f_{ck} distributed uniformly in the compression block.

Options :

878270178113. 1

878270178114. 2

878270178115. 3

878270178116. 4

Question Number : 20 Question Id : 87827045320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Slenderness Limit for beams to ensure lateral stability, a simply supported or continuous beam shall be so proportioned that the clear distance between the lateral restraints does not exceed

where,

d = the effective depth of the beam

b = breadth of the compression face midway betwecn the lateral restraints

1. $240b^2/d$
2. $250b^2/d$
3. $260b^2/d$
4. $270b^2/d$

Options :

878270178117. 1

878270178118. 2

878270178119. 3

878270178120. 4

Question Number : 21 Question Id : 87827045321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The mass specific gravity (apparent specific gravity) of a soil equals to 1.64. The specific gravity of solids is 2.70. What would be the voids ratio, if the sample is assumed to have a water content of 8 percent?

1. e = 0.87
2. e = 0.78
3. e = 0.646
4. e = 0.62

Options :

878270178121. 1

878270178122. 2

878270178123. 3

878270178124. 4

Question Number : 22 Question Id : 87827045322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The following data on consistency limits are available for two soils A and B.

	Soil A	Soil B
1. Plastic Limit	16 %	19 %
2. Liquid limit	30 %	52 %
3. Natural water content	32 %	40 %

find which soil is (a) more plastic, (b) better foundation material on remoulding.

1. Soil A is more plastic and soil A will be suitable for foundations.
2. Soil B is more plastic and soil A will be suitable for foundations.
3. Soil B is more plastic and soil B will be suitable for foundations.
4. Soil A is more plastic and soil B will be suitable foundations.

Options :

878270178125. 1

878270178126. 2

878270178127. 3

878270178128. 4

Question Number : 23 Question Id : 87827045323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The expression for the determintion of location of the failure plane (derived from Mohr's circle) is :

(where, Φ' = effective angle of shear resistance

α = inclination of shear stress on any plane.)

1. α = 55° + Φ' / 2
2. α = 45° + Φ' / 2
3. α = 65° + Φ' / 2
4. α = 50° + Φ' / 2

Options :

878270178129. 1

878270178130. 2

878270178131. 3

878270178132. 4

Question Number : 24 Question Id : 87827045324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Two clay specimens A and B, of thickness 2 cm and 3 cm, have equilibrium voids ratios 0.68 and 0.72 respectively, under a pressure of 200 kN / m². If the ratio of coefficient of volume change i.e., $(m_v)_A / (m_v)_B$ =1.845, find the ratio of the coefficient of permeability of the two specimens. The time required by the specimen A to reach 40% of degree of consolidation is 1/4 of that required by the specimen B for reaching 40% degree of consolidation.

1. 3.28
2. 3.90
3. 2.80
4. 2.50

Options :

878270178133. 1

878270178134. 2

878270178135. 3

878270178136. 4

Question Number : 25 Question Id : 87827045325 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

In cohesionless soils, when flow takes place in an upward direction, the seepage pressure becomes equal to the pressure due to submerged weight of the soil and hence the effective pressure is reduced to zero. This phenomenon of lifting of soil particles is called as

1. Local shear failure
2. Earth pressure
3. Quick sand condition
4. Brownian movement

Options :

878270178137. 1

878270178138. 2

878270178139. 3

878270178140. 4

Question Number : 26 Question Id : 87827045326 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

In case of infinite slopes, stability number (S_n) for cohesive soil is expressed as

(A) $c / (\gamma H_c)$

(B) $c_m / \gamma H$

(C) $c / (F_c \gamma H)$

(D) $(\tan i - \tan \Phi) \cos^2 i$

where, c is cohesion, c_m is mobilised cohesion, H is depth, γ is bulk density of the soil, F_c is factor of safety, i is angle of slope and Φ is angle of shearing resistance

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

878270178141. 1

878270178142. 2

878270178143. 3
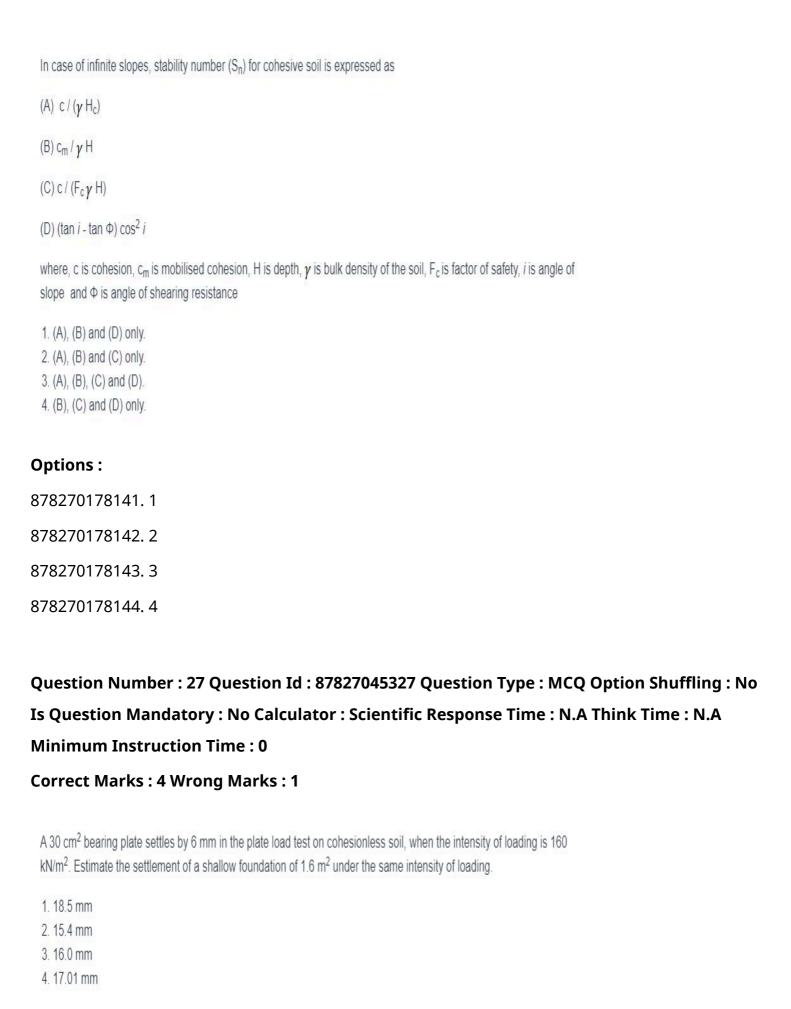
878270178144. 4

Question Number : 27 Question Id : 87827045327 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A 30 cm^2 bearing plate settles by 6 mm in the plate load test on cohesionless soil, when the intensity of loading is 160 kN/m^2. Estimate the settlement of a shallow foundation of 1.6 m^2 under the same intensity of loading.

1. 18.5 mm
2. 15.4 mm
3. 16.0 mm
4. 17.01 mm

Options :

878270178145. 1

878270178146. 2

878270178147. 3

878270178148. 4

Question Number : 28 Question Id : 87827045328 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The expression for the determination of minimum depth (D_{min}) of foundation proposed by Rankine's analysis is

(where, q is intensity of loading, F is factor of safety, γ is bulk unit weight and Φ is angle of shearing resistance)

1. $D_{min} = (F / \gamma) [(1 + \sin \Phi) / (1 - \sin \Phi)]^2$
2. $D_{min} = (q / \gamma) [(1 - \sin \Phi) / (1 + \sin \Phi)]^2$
3. $D_{min} = (\gamma / F) [(1 - \sin \Phi) / (1 + \sin \Phi)]^2$
4. $D_{min} = (q / \gamma) [(1 - \tan \Phi) / (1 + \tan \Phi)]^2$

Options :

878270178149. 1

878270178150. 2

878270178151. 3

878270178152. 4

Question Number : 29 Question Id : 87827045329 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The basic assumptions of the Coulomb's wedge theory are:

(A) The slip surface is plane which passes through the heel of the wall.

(B) The sliding wedge itself acts as a rigid body and the value of the earth pressure is obtained by considering the limiting equilibrium of the sliding wedge as a whole.

(C) The backfill is dry, cohesionless, homogenous, isotropic and elastically undeformable but breakable.

(D) The position and direction of the resultant earth pressure are known. The resultant pressure acts on the back of the wall at one-third the height of the wall from the base and is inclined at an angle δ to the normal to the back

Choose the *correct* answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

878270178153. 1

878270178154. 2

878270178155. 3

878270178156. 4

Question Number : 30 Question Id : 87827045330 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II

List - I	List - II
Types of pile	Function of pile
(A) Tension piles	(I) are commonly used as bulkheads, or as impervious cutoff to reduce seepage and uplift under hydraulic structures
(B) End bearing piles	(II) are used to protect water front structures against the impact from ships or other floating objects
(C) Sheet piles	(III) anchor down the structures subjected to uplift due to hydrostatic pressure or due to overturning moment
(D)Fender piles	(IV) transfer load through water or soft soil to a suitable bearing stratum

Choose the correct answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Options :

878270178157. 1

878270178158. 2

878270178159. 3

878270178160. 4

Question Number : 31 Question Id : 87827045331 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For forced vibration system, the vibration isolation is possible only when

1. $\omega/\omega_n = 1$
2. $\omega/\omega_n < 1$
3. $\omega/\omega_n > \sqrt{2}$
4. $\omega/\omega_n < \sqrt{2}$

Options :

878270178161. 1

878270178162. 2

878270178163. 3

878270178164. 4

Question Number : 32 Question Id : 87827045332 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The given equation for the computation of earthquake magnitude

$$M = \log_{10} A - \log_{10} A_0$$

where, A is recorded amplitude in μm and A_0 is the amplitude for zero magnitude earthquakes at different epicentral distances

is known as

1. Surface wave magnitude
2. Body wave magnitude
3. Duration magnitude
4. Richter magnitude

Options :

878270178165. 1

878270178166. 2

878270178167. 3

878270178168. 4

Question Number : 33 Question Id : 87827045333 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A seismic wave that shakes the ground back and forth perpendicular to the direction the wave is moving is called as

1. Compressional wave
2. Love wave
3. Shear wave
4. Rayleigh wave

Options :

878270178169. 1

878270178170. 2

878270178171. 3

878270178172. 4

Question Number : 34 Question Id : 87827045334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the term is irrelevant, to describe earthquake potential in deterministic seismic hazard analysis

1. Maximum credible earthquake (MCE)
2. Design basis earthquake (DBE)
3. Maximum probable earthquake (MPE)
4. Probabilistic risk assessment (PRA)

Options :

878270178173. 1

878270178174. 2

878270178175. 3

878270178176. 4

Question Number : 35 Question Id : 87827045335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The two primary mechanisms that cause decrease in the amplitude of stress wave when the wave travels through the earth's crust are:

(A). Magnetic damping

(B). Coulomb damping

(C). Material damping

(D). Radiation damping

Choose the *correct* answer from the options given below:

1. (C) and (D) only.
2. (A), (B), (C), and (D).
3. (A), and (D) only.
4. (B), (C) and (D) only.

Options :

878270178177. 1

878270178178. 2

878270178179. 3

878270178180. 4

Question Number : 36 Question Id : 87827045336 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Using Newmark's hall design spectrum, the accelaration, velocity, and displacement amplification factors are 2.6, 1.9 and 1.4 respectively. Calculate the peak spectral values. Take damping = 5% and peak ground accelaration of 0.25g

1. $S_a = 0.50$ g, $S_v = 65.13$ cm/sec, $S_d = 28.0$ cm
2. $S_a = 0.65$g, $S_v = 57.91$ cm/sec, $S_d = 32.0$ cm
3. $S_a = 0.72$g, $S_v = 45.2$ cm/sec, $S_d = 38.0$ cm
4. $S_a = 0.55$g, $S_v = 62.34$ cm/sec, $S_d = 41.0$ cm

Options :

878270178181. 1

878270178182. 2

878270178183. 3

878270178184. 4

Question Number : 37 Question Id : 87827045337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In static slope stability analysis, the factor of safety (for limit equilibrium analysis) is constant over the entire failure surface because the soil on the potential failure surface is assumed to be

1. Linear elastic
2. Elasto-plastic
3. Rigid-perfectly plastic
4. Elastic-perfectly plastic

Options :

878270178185. 1

878270178186. 2

878270178187. 3

878270178188. 4

Question Number : 38 Question Id : 87827045338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of these assumptions are *true* for one-dimensional ground response analysis

(A). Soil is linear elastic and behaves like a uniform material

(B). Both shear stresses and shear strains are uniform

(C). The soil and bedrock surface are assumed to extend infinitely in the horizontal direction

(D). All boundaries are horizontal and that the response of a soil deposit is predominantly caused by SH-waves propogating vertically from the underlying bedrock

Choose the *correct* answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (A), (C) and (D) only.

Options :

878270178189. 1

878270178190. 2

878270178191. 3

878270178192. 4

Question Number : 39 Question Id : 87827045339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The typical failure mechanisms for a gravity retaining wall are:

(A). Translational failure

(B). Rotational failure

(C). Gross instability failure

(D). Rocking failure

Choose the *correct* answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), (C) and (D) only.

Options :

878270178193. 1

878270178194. 2

878270178195. 3

878270178196. 4

Question Number : 40 Question Id : 87827045340 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The **correct** expression for the shear stress (τ) on a plane inclined at an angle α to the x-axis is

1. $\dfrac{\sigma_x + \sigma_y}{2} + \dfrac{\sigma_x + \sigma_y}{2} \cos 2\alpha - \tau_{xy} \sin 2\alpha$

2. $\dfrac{\sigma_x + \sigma_y}{2} - \dfrac{\sigma_x + \sigma_y}{2} \cos 2\alpha - \tau_{xy} \sin 2\alpha$

3. $\dfrac{\sigma_x + \sigma_y}{2} - \dfrac{\sigma_x + \sigma_y}{2} \sin 2\alpha - \tau_{xy} \cos 2\alpha$

4. $\dfrac{\sigma_x - \sigma_y}{2} \sin 2\alpha - \tau_{xy} \cos 2\alpha$

Options :

878270178197. 1

878270178198. 2

878270178199. 3

878270178200. 4

Question Number : 41 Question Id : 87827045341 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II

List-I	List-II
Classification of surveying	as per method and application
(A).Plane table	(I). is carried out when the linear measurements are done with a chain and a tape and the directions or horizontal angles are measured with a compass or theodolite respectively
(B).Triangulation	(II). is a graphical method of surveying in which field works and plotting both are done simultaneously
(C). Traversing	(III). is used to determine the vertical distances (elevations) and relative height of points
(D). Levelling	(IV). is used when area to be surveyed is large and is divided into small number of triangles

Choose the correct answer from the options given below:

1. (A) - (II), (B) - (IV), (C) - (I), (D) - (III)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Options :

878270178201. 1

878270178202. 2

878270178203. 3

878270178204. 4

Question Number : 42 Question Id : 87827045342 Question Type : MCQ Option Shuffling : No

The long and short sides of a rectangle measure 8.28 m and 4.36 m, with errors of ± 5 mm. Express the area to correct number of significant figures.

1. $36.25 \, m^2$
2. $36.01 \, m^2$
3. $36.29 \, m^2$
4. $36.10 \, m^2$

Options :

878270178205. 1

878270178206. 2

878270178207. 3

878270178208. 4

Question Number : 43 Question Id : 87827045343 Question Type : MCQ Option Shuffling : No

Which instrument is a combination of EDM, electronic theodolite and microprocessor?

1. Tacheometer
2. Total station
3. Distomite
4. Tellurometer

Options :

878270178209. 1

878270178210. 2

878270178211. 3

878270178212. 4

Question Number : 44 Question Id : 87827045344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Which of the statement is not correct for remote sensing?

1. It requires absorption of energy by the earth's surface.
2. It requires propogation of energy through atmosphere.
3. It reqiures energy interaction with earth's surface features.
4. Recording of energy by the sensor.

Options :

878270178213. 1

878270178214. 2

878270178215. 3

878270178216. 4

Question Number : 45 Question Id : 87827045345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match **List-I** with **List-II**

List-I	List-II
Test	purpose
(A). California bearing ratio (CBR) test	(I). gives an indication of critical temperature at and above which suitable precaution should be taken to eliminate fire hazards during heating of bitumen
(B). Static immersion test	(II). is carried out on bitumen to test it's ability to form thin film around aggregates
(C). flash and fire point test	(III). is for the estimation of the degree of stripping
(D). Ductility test	(IV). is for the evaluation of the stability of soil subgrade and other flexible pavement materials

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (III), (C) - (I), (D) - (II)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

Options :

878270178217. 1

878270178218. 2

878270178219. 3

878270178220. 4

Question Number : 46 Question Id : 87827045346 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

What nature of warping stresses are generated in a reinforced cement concrete pavement during a summer mid-day?

1. Compressive in bottom fibre and tensile in top fibre
2. Tensile in both top and bottom fibre
3. Compressive in both top and bottom fibre
4. Tensile in bottom fibre and compressive in top fibre

Options :

878270178221. 1

878270178222. 2

878270178223. 3

878270178224. 4

Question Number : 47 Question Id : 87827045347 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The contact pressure P_c, tyre pressure P and rigidity factor R are related by

1. $P/P_c = R$
2. $P_c/P = R$
3. $P \times P_c = R$
4. $R = \sqrt{(P \times P_c)}$

Options :

878270178225. 1

878270178226. 2

878270178227. 3

878270178228. 4

Question Number : 48 Question Id : 87827045348 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

What will be the theoritical maximum capacity (to nearest 10 units) for a single lane of highways given that the speed of the traffic stream is 40 km/hr.

1. 3000 vehicles/hr
2. 2860 vehicles/hr
3. 2510 vehicles/hr
4. 2010 vehicles/hr

Options :

878270178229. 1

878270178230. 2

878270178231. 3

878270178232. 4

Question Number : 49 Question Id : 87827045349 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

At a certain station, the mean of the average temperature is 25°C and mean of the maximum daily temperature is 40°C. What is the airport reference temperature (ART)?

1. 20.6°C
2. 25° C
3. 30°C
4. 38.6° C

Options :

878270178233. 1

878270178234. 2

878270178235. 3

878270178236. 4

Question Number : 50 Question Id : 87827045350 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Correct Marks : 4 Wrong Marks : 1

Newton's law of viscosity relates

1. Pressure, velocity and viscosity
2. shear stress and rate of angular deformation in a fluid
3. shear stress, temperature, velocity and viscosity
4. Rate of angular deformation, pressure, velocity and viscosity

Options :

878270178237. 1

878270178238. 2

878270178239. 3

878270178240. 4

Question Number : 51 Question Id : 87827045351 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In the context of "water and waste water treatment" the correct statements are:

(A). Particulate matter may shield micro-organisms during disinfection

(B). Ammonia decreases chlorine demand

(C). Phosphorous stimulate algal and aquatic growth

(D). Calcium and magnesium increase hardness and total dissolved solids

Choose the *correct* answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (A), (B), (C) and (D).
4. (A), (C) and (D) only.

Options :

878270178241. 1

878270178242. 2

878270178243. 3

878270178244. 4

Question Number : 52 Question Id : 87827045352 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Activated sludge process is an example of

1. Anaerobic suspended growth process
2. Anaerobic attached growth process
3. Aerobic attached growth process
4. Aerobic suspended growth process

Options :

878270178245. 1

878270178246. 2

878270178247. 3

878270178248. 4

Question Number : 53 Question Id : 87827045353 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

In practice, flow velocity adopted for the design of a grit chamber is:

1. 3 to 5 m / sec
2. 0.15 to 0.3 m / sec
3. 1 to 2 m / sec
4. 0.5 to 2 m / sec

Options :

878270178249. 1

878270178250. 2

878270178251. 3

878270178252. 4

Question Number : 54 Question Id : 87827045354 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The following observations were made on 2% dilution of waste water:

Dissolved oxygen of aerated water used for dilution = 0 mg/l

Dissolved oxygen of diluted sample after 5 days = 0.6 mg/l

Dissolved oxygen of original sample = 2.0 mg/l

The B.O.D of 5 days of the sample is:

1. 70 mg/l
2. 60 mg/l
3. 100 mg/l
4. 80 mg/l

Options :

878270178253. 1

878270178254. 2

878270178255. 3

878270178256. 4

Question Number : 55 Question Id : 87827045355 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Carbon mono oxide (CO) is a

1. polycyclic aromatic hydrocarbon
2. volatile organic compound (VOC)
3. green house gas
4. component in determining Air quality index (AQI)

Options :

878270178257. 1

878270178258. 2

878270178259. 3

878270178260. 4

Question Number : 56 Question Id : 87827045356 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

what is the correct sequence of prescribed limits in residential areas of 24 hourly averages following pollutants by Central Pollution Control Board of India

(A). PM 2.5

(B). PM 10

(C). SO_x

(D). Pb

Choose the correct answer from the options given below:

1. (A), (C), (D), (B).
2. (A), (B), (C), (D).
3. (B), (C), (A), (D).
4. (C), (B), (D), (A).

Options :

878270178261. 1

878270178262. 2

878270178263. 3

878270178264. 4

Question Number : 57 Question Id : 87827045357 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The minimum height of chimney for an industry emitting SO_2 is H. If the SO_2 emissions gets doubled the required minimum height of chimney would be

1. 1:18H
2. 1.26 H
3. 1.54 H
4. 2 H

Options :

878270178265. 1

878270178266. 2

878270178267. 3

878270178268. 4

Question Number : 58 Question Id : 87827045358 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The maximum C/N ratio in a municipal solid waste compost is

1. 5-10
2. 10-20
3. 50-60
4. 20-40

Options :

878270178269. 1

878270178270. 2

878270178271. 3

878270178272. 4

Question Number : 59 Question Id : 87827045359 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

The minimum particle size removed by the gravitational chamber is

1. 10 µm
2. 25 µm
3. 35 µm
4. 50 µm

Options :

878270178273. 1

878270178274. 2

878270178275. 3

878270178276. 4

Question Number : 60 Question Id : 87827045360 Question Type : MCQ Option Shuffling : No
Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A
Minimum Instruction Time : 0
Correct Marks : 4 Wrong Marks : 1

In which of the following ways, high level of radioactive waste can be managed

1. Composting
2. Store indefinitely
3. Incineration
4. Neutralization

Options :

878270178277. 1

878270178278. 2

878270178279. 3

878270178280. 4

Question Number : 61 Question Id : 87827045361 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For Laminar flow of an oil having dynamic viscosity $\mu = 1.566$ pa.s in a 0.4 diameter pipe, the viscosity distribution is parabolic with a maximum point velocity of 2.5 m/s at the centre of the pipe. Calculate the shearing stress at the pipe wall.

1. 45 pa
2. 35 pa
3. 39 pa
4. 25 pa

Options :

878270178281. 1

878270178282. 2

878270178283. 3

878270178284. 4

Question Number : 62 Question Id : 87827045362 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A Smooth brass pipeline 75 mm in diameter and 900 m long carries water at the rate of 7 litres per second. If the kinematic viscosity of water is 0.0195 stokes. Calculate the loss of head

1. 20 m
2. 25 m
3. 31 m
4. 45 m

Options :

878270178285. 1

878270178286. 2

878270178287. 3

878270178288. 4

Question Number : 63 Question Id : 87827045363 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The line of action of the buoyant force acts through the

1. centre of the gravity of any submerged body
2. centroid of the displaced volume of fluid
3. centroid of the volume of any floating body
4. centroid of the horizontal projection of the body

Options :

878270178289. 1

878270178290. 2

878270178291. 3

878270178292. 4

Question Number : 64 Question Id : 87827045364 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For a constant specific energy of 1.8 Nm/N, calculate the maximum discharge that may occur in a rectangular channel 4 m wide

1. 16.48 m³/s
2. 20.15 m³/s
3. 12.56 m³/s
4. 10.50 m³/s

Options :

878270178293. 1

878270178294. 2

878270178295. 3

878270178296. 4

Question Number : 65 Question Id : 87827045365 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Infiltration process is

1. movement of water through the soil
2. absorption of water by surface of the soil
3. saturation of the soil
4. capillary rise of water in the soil

Options :

878270178297. 1

878270178298. 2

878270178299. 3

878270178300. 4

Question Number : 66 Question Id : 87827045366 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

To determine the reservoir storage capacity for a given uniform demand, one of the following data is most useful

1. unit hydrograph of the basin
2. daily flow-duration curve of the stream at the dam site
3. stage-discharge relation for the stream at the reservoir site
4. mass curve of the flow volumes for several consecutive years

Options :

878270178301. 1

878270178302. 2

878270178303. 3

878270178304. 4

Question Number : 67 Question Id : 87827045367 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A crop requires 850 mm of water for a base period of 115days. Find the duty of water

1. 1156 hectares/cumec
2. 1169 hectares/cumec
3. 1220 hectares/cumec
4. 1546 hectares/cumec

Options :

878270178305. 1

878270178306. 2

878270178307. 3

878270178308. 4

Question Number : 68 Question Id : 87827045368 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of "point of contraflexure" that occur in a cantilever beam subjected to a uniformly distributed load is

1. 0
2. 1
3. 2
4. 3

Options :

878270178309. 1

878270178310. 2

878270178311. 3

878270178312. 4

Question Number : 69 Question Id : 87827045369 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Where does shear stress (maximum) occur in a rectangular shaft subjected to torsion

(A). Centre

(B). Corner

(C). Middle of the shorter side

(D). Middle of the longer side

Choose the *correct* answer from the options given below:

1. (A) only.
2. (A) and (B) only
3. (C) and (D) only.
4. (D) only.

Options :

878270178313. 1

878270178314. 2

878270178315. 3

878270178316. 4

Question Number : 70 Question Id : 87827045370 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If velocity potential (φ) satisfies the Laplace equation, it represents

(A). Uniform flow

(B). Steady flow

(C). Rotational flow

(D). Irrotational flow

Choose the *correct* answer from the options given below:

1. (A), (B) and (D) only.
2. (B) and (C) only.
3. (A), (B), (C) and (D).
4. (B), and (D) only.

Options :

878270178317. 1

878270178318. 2

878270178319. 3

878270178320. 4

Question Number : 71 Question Id : 87827045371 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Assuming the distribution of the heights of adult men is normal, with mean 174 cm and standard deviation 7 cm. Then the probability that a randomly selected adult men is between 180 cm and 185 cm is:

(Given Z at 1.571 = 0.94 and Z at 0.857 = 0.80)

1. 0.41
2. 0.14
3. 0.47
4. 0.54

Options :

878270178321. 1

878270178322. 2

878270178323. 3

878270178324. 4

Question Number : 72 Question Id : 87827045372 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The Eigen vectors of the matrix

$$\begin{bmatrix} 1 & 1 \\ 4 & 1 \end{bmatrix}$$

are:

1. $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ -2 \end{pmatrix}$

2. $\begin{pmatrix} -1 \\ 2 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ 1 \end{pmatrix}$

3. $\begin{pmatrix} 2 \\ 1 \end{pmatrix}$ and $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$

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

Options :

878270178325. 1

878270178326. 2

878270178327. 3

878270178328. 4

Question Number : 73 Question Id : 87827045373 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The value of the intergral

$$\int_C \frac{e^{-z}}{z+1}\, dz$$

where C is the circle, $\quad |Z| = \frac{1}{2}$

is:

1. 2π
2. $2\pi i$
3. 0
4. $4\pi i$

Options :

878270178329. 1

878270178330. 2

878270178331. 3

878270178332. 4

Question Number : 74 Question Id : 87827045374 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The solution of the differential equation

$$\frac{d^2x}{dt^2} + x = 0$$

Given that, $x(0) = 2$ and $x\left(\frac{\pi}{2}\right) = -2$

is:

1. $x = 2\sin t + 2\cos t$
2. $x = 2\sin t - 2\cos t$
3. $x = 2\cos t + 2\sin t$
4. $x = 2\cos t - 2\sin t$

Options :

878270178333. 1

878270178334. 2

878270178335. 3

878270178336. 4

Question Number : 75 Question Id : 87827045375 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No Calculator : Scientific Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The solution of the differential equation

$$\frac{dy}{dx} + \frac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$$

is :

1. $C = y\sin x + x(\sin y + y)$
2. $C = y\sin x - (\sin y + y)$
3. $C = \sin x - (\cos y - y)$
4. $C = \sin x + y(\cos y - y)$

Options :

878270178337. 1

878270178338. 2

878270178339. 3

878270178340. 4