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Question Paper Name :	Civil Engineering 29th May 2023 Shift 1
Duration :	120
Total Marks :	120
Display Marks:	No
Share Answer Key With Delivery Engine :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
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Civil Engineering

Section Id :	78773222
Section Number :	1
Mandatory or Optional :	Mandatory
Number of Questions :	120
Section Marks :	120
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 7877322521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Deformation of a bar under its own weight is _____ the deformation due to direct load equal to the weight of the body applied at the lower end.

Options :

1. ✔ Half

2. ✖ Double

3. ✖ Four times

4. ✖ Equal to

Question Number : 2 Question Id : 7877322522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shape of bending moment diagram over the length of the beam, carrying a uniformly varying load is always

Options :

1. ✖ linear

2. ✖ parabolic

3. ✔ cubical

4. ✖ circular

Question Number : 3 Question Id : 7877322523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ Polar moment of inertia

2.

✔ Polar modulus

3. ✖ Moment of inertia

4. ✖ Modulus of rigidity

Question Number : 4 Question Id : 7877322524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a circular column having its ends hinged, if slenderness ratio is 160, then *l/d* ratio of the column is

Options :

1. ✖ 20

2. ✔ 40

3. ✖ 30

4. ✖ 50

Question Number : 5 Question Id : 7877322525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cylindrical bar of 20 mm diameter and 1 m length is subjected to a tensile test. Its longitudinal strain is 4 times its lateral strain. If modulus of elasticity is $2x10^5$ N/mm^2, then the modulus of rigidity will be

Options :

1. ✖ $8x10^6$ N/mm^2

2. ✖ $8x10^5$ N/mm^2

3. ✖ $0.8x10^4$ N/mm^2

4. ✔ $0.8x10^5$ N/mm^2

Question Number : 6 Question Id : 7877322526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With one end fixed and other free, a column of length L buckles at load P_1. Another column of same length and same cross section fixed at both ends buckles at load P_2. The ratio P_2/P_1 is

Options :

1. ✔ 16

2. ✖ 12

3.

✖ 8

4. ✖ 4

Question Number : 7 Question Id : 7877322527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If an element is subjected to pure shearing stress τ, then the maximum principal stress is equal to

Options :

1. ✖ 2τ

2. ✖ $\tau/2$

3. ✔ τ

4. ✖ $\sqrt{1-\tau^2}$

Question Number : 8 Question Id : 7877322528 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A thin-walled cylindrical pressure vessel having a radius of 0.5 m and wall thickness of 25 mm is subjected to an internal pressure of 700 N/m^2. The hoop stress developed is

Options :

1. ✖ 14 MPa

2. ✖ 1.4 MPa

3. ✖ 0.14 MPa

4. ✔ 0.014 MPa

Question Number : 9 Question Id : 7877322529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a rectangular section of width b and depth d, second moment of area about an axis at a distance $d/4$ above the bottom is

Options :

1. ✖ $\frac{bd^3}{48}$

2. ✔ $\frac{7bd^3}{48}$

3. ✖ $\frac{bd^3}{12}$

4. ✖ $\frac{bd^3}{3}$

Question Number : 10 Question Id : 7877322530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A simply supported beam of span L carries a concentrated load P at mid span. If the width b of the beam is constant and its depth d is varying throughout the length of the span, what will be its midspan depth when design stress is f ?

Options :

1. ✖ $\frac{6PL}{bf}$

2. ✖ $\sqrt{\frac{6PL}{bf}}$

3. ✔ $\sqrt{\frac{3PL}{2bf}}$

4. ✖ $\frac{3PL}{2bf}$

Question Number : 11 Question Id : 7877322531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The point within the cross-sectional plane of the beam through which the resultant of the external loading on the beam must pass through to ensure pure bending without twisting of cross section of the beam is called

Options :

1. ✖ moment centre

2. ✖ centroid

3. ✖ elastic centre

4. ✔ shear centre

Question Number : 12 Question Id : 7877322532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of the maximum deflection of a simply supported beam with an isolated central load to that with a uniformly distributed load over its entire length is

Options :

1. ✖ 1

2. ✖ 15/24

3. ✔ 24/15

4. ✖ 2/3

Question Number : 13 Question Id : 7877322533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Number of unknowns to be determined in the stiffness method is equal to

Options :

1. ✖ static indeterminacy

2. ✔ kinematic indeterminacy

3. ✖ sum of static and kinematic indeterminacy

4. ✖ less than static indeterminacy

Question Number : 14 Question Id : 7877322534 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Slope at the end of simply supported beam of span 2 m with a load of 5 N/m over the entire span is

Options :

1. ✔ 5/3 EI

2. ✖ 1/16 EI

3. ✖ 2/6 EI

4. ✖ 2/3 EI

Question Number : 15 Question Id : 7877322535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shape of influence line diagram for maximum bending moment in a simply supported beam is

Options :

1. ✖ rectangular

2. ✖ parabolic

3. ✖ circular

4. ✔ triangular

Question Number : 16 Question Id : 7877322536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A cantilever beam of length L and flexural stiffness EI is subjected to a concentrated load W at free end. The deflection at free end of the beam is

Options :

1. ✖ $WL^3/6EI$

2. ✖ $WL^3/8EI$

3. ✔ $WL^3/3EI$

4. ✖ $WL^3/2EI$

Question Number : 17 Question Id : 7877322537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following statements is not correct?

Options :

1. ✖ Minimum cross-sectional area of longitudinal reinforcement in a column is 0.8%.

2. ✖ Spacing of longitudinal bars measured along the periphery of column should not exceed 300 mm.

3. ✖ Reinforcing bars in column should not be less than 12 mm in diameter.

The number of longitudinal bars provided in a circular column should not be less than 4.

4. ✔

Question Number : 18 Question Id : 7877322538 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An axially loaded column is of size 300 mm x 300 mm. Effective length of column is 3 m. The minimum eccentricity of the axial load for the column is

Options :

1. ✖ 10 mm

2. ✖ 16 mm

3. ✔ 20 mm

4. ✖ 25 mm

Question Number : 19 Question Id : 7877322539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

What is the adjustment to the minimum cement content for nominal maximum aggregate size of 10 mm

Options :

1. ✖ $+20\ kg/m^3$

2. ✔ $+40\ kg/m^3$

3. ✖ $-40\ kg/m^3$

4. ✖ $-20\ kg/m^3$

Question Number : 20 Question Id : 7877322540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The modulus of elasticity of concrete is obtained from

Options :

1. ✖ tangent modulus

2. ✖ secant modulus

3. ✖ chord modulus

4. ✔ initial tangent modulus

Question Number : 21 Question Id : 7877322541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

One of the criteria for the effective width of flange of a T-beam is $b_f = L_0/6 + b_w + 6D_f$,

where L_0 signifies

Options :

1. ✔ distance between points of zero moments in the beam

2. ✖ effective span of the beam

3. ✖ distance between points of maximum moments in the beam

4. ✖ clear span of T-beam

Question Number : 22 Question Id : 7877322542 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The amount of shear force for which shear reinforcement shall be designed is

Options :

1. ✖ $\tau_c bd$

2. ✖ $\tau_v bd$

3. ✔ $(\tau_v - \tau_c)bd$

4. ✖ $(\tau_v + \tau_c)bd$

Question Number : 23 Question Id : 7877322543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which of the following load combination is not considered for avoiding the limit state of collapse (DL- Dead Load, LL-Live Load, WL- Wind Load, EL- Earthquake Load)?

Options :

1. ✖ 0.9 DL + 1.5 WL

2. ✖ 1.5 DL + 1.5 WL

3. ✖ 1.2 DL + 1.2 LL + 1.2 WL

4. ✔ 1.5 DL + 1.5 WL + 1.5 EL

Question Number : 24 Question Id : 7877322544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

Increase in strain with time at constant stress in steel is called

Options :

1. ✔ relaxation

2. ✖ creep

3. ✖ shrinkage

4. ✖ ductility

Question Number : 25 Question Id : 7877322545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum compressive strain in concrete in axial compression is taken as

Options :

1. ✖ 0.001

2. ✔ 0.002

3. ✖ 0.003

4. ✖ 0.004

Question Number : 26 Question Id : 7877322546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The distance between theoretical cut-off point and actual cut-off point with respect to the curtailment of reinforcement in reinforced concrete beams should not be less than

Options :

1. ✖ development length

2. ✔ 12 x dia. of bar or effective depth whichever is greater

3. ✖ 24 x dia. of bar or effective depth whichever is greater

4. ✖ 30 x dia. of bar or effective depth whichever is greater

Question Number : 27 Question Id : 7877322547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The deflections including effects of temperature, creep and shrinkage occurring after erection of partitions and application of finishes should not normally exceed the lesser value of

Options :

1. ✖ span/300 or 20 mm

2. ✖ span/200 or 20 mm

3. ✖ span/250 or 10 mm

4. ✔ span/350 or 20 mm

Question Number : 28 Question Id : 7877322548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In singly reinforced concrete cantilever beams, the reinforcing steel bars are placed

Options :

1. ✖ near bottom of the beam

2. ✖ at the neutral axis of the beam

3. ✔ near the top of the beam

4. ✖ anywhere in the cross section of the beam

Question Number : 29 Question Id : 7877322549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Inclination of lacing bar to the longitudinal axis of composite compression member shall be in the range of

Options :

1. ✖

30° to 45°

2. ✔ 40° to 70°

3. ✖ 45° to 60°

4. ✖ 35° to 50°

Question Number : 30 Question Id : 7877322550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the angle between fusion faces ranges from 60° to 90°, then the ratio of throat thickness to effective throat thickness would be

Options :

1. ✔ 0.7

2. ✖ 0.65

3. ✖ 0.6

4. ✖ 0.55

Question Number : 31 Question Id : 7877322551 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The plastic section modulus for a rectangular section of width b and depth d is

Options :

1. ✖ $bd^3/3$

2. ✖ $bd^3/6$

3. ✔ $bd^2/4$

4. ✖ $bd^2/12$

Question Number : 32 Question Id : 7877322552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a structure is statically indeterminate to second degree, then the maximum number of plastic hinges required to render a mechanism is/are

Options :

1. ✖ 0

2. ✖ 1

3. ✖ 2

4. ✔ 3

Question Number : 33 Question Id : 7877322553 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum size of fillet weld for connecting 16 mm and 14 mm thick plates is

Options :

1. ✖ 14 mm

2. ✔ 12.5 mm

3. ✖ 16 mm

4. ✖ 14.5 mm

Question Number : 34 Question Id : 7877322554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A structural steel tube has a radius of gyration of 20 mm. The unbraced length up to which the tube can be used as a compression member is

Options :

1. ✔ 3600 mm

2. ✖ 3200 mm

3. ✖ 3400 mm

4. ✖ 3000 mm

Question Number : 35 Question Id : 7877322555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum number of bolt(s) of 20 mm diameter that can be accommodated in one row of a 160 mm wide flat is/are

Options :

1. ✖ 1

2. ✔ 2

3. ✖ 3

4. ✖ 4

Question Number : 36 Question Id : 7877322556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nominal strength of a fillet weld is

Options :

1. ✖ f_u

2. ✖ $\frac{f_u}{\sqrt{3}\,\gamma_{mw}}$

3. ✖ f_y

4. ✔ $\frac{f_u}{\sqrt{3}}$

Question Number : 37 Question Id : 7877322557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per IS:800 purlins are designed as

Options :

1. ✖ simply supported beams

2. ✖ fixed beams

3. ✔ continuous beams

4. ✖ compression member

Question Number : 38 Question Id : 7877322558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The A-line in IS classification system has the equation

Options :

1. ✖ IP = WL - 20

2. ✔ IP = 0.73(WL - 20)

3. ✖ IP = 0.73(20 - WL)

4. ✖ IP = 20 - WL

Question Number : 39 Question Id : 7877322559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An arrangement composed of soil particle having a parallel orientation is

Options :

1. ✔ dispersed

2. ✖ coarse grained skeleton

3. ✖ honey comb

4. ✖ flocculated

Question Number : 40 Question Id : 7877322560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a soil sample, the degree of saturation is 90%, specific gravity of soil grains is 2.7 and void ratio is 0.3. The water content (%) of the sample is

Options :

1. ✔ 10

2. ✖ 13.5

3. ✖ 22.5

4. ✖ 35

Question Number : 41 Question Id : 7877322561 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In hydrometer analysis for a soil mass

Options :

1. ✖ both meniscus and dispersive agent correction are additive

2. ✖ both meniscus and dispersive agent correction are subtractive

3. ✔ meniscus correction is additive and dispersive agent correction is subtractive

4. ✖ meniscus correction is subtractive and dispersive agent correction is additive

Question Number : 42 Question Id : 7877322562 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Atterberg limits of a clay are 38%, 27% and 24.5%. Its natural water content is 30%. The clay is in

Options :

1. ✖ liquid state

2. ✔ plastic state

3. ✖ semi-solid state

4. ✖ elastic state

Question Number : 43 Question Id : 7877322563 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Principle involved in the relationship between submerged unit weight and saturated unit weight of soil is based on

Options :

1. ✖ Darcy's law

2. ✖ Stokes law

3. ✔ Archimedes principle

4. ✖ equilibrium of floating bodies

Question Number : 44 Question Id : 7877322564 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the soil beneath a dam, G = 2.7 and e = 0.7. The total head loss during the flow is 5 m. The number of equipotential drops is 10. The length of flow at the toe is 1 m. The factor of safety against boiling is

Options :

1. ✔ 2.0

2. ✖ 4.2

3. ✖ 1.0

4. ✖ 5.0

Question Number : 45 Question Id : 7877322565 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shape of the phreatic line in an earth dam is

Options :

1. ✖ circular

2. ✖ hyperbolic

3. ✖ elliptical

4. ✔ parabolic

Question Number : 46 Question Id : 7877322566 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Stokes law cannot be applied to particle size greater than

Options :

1. ✖ 0.02 mm

2. ✔ 0.2 mm

3. ✖ 0.002 mm

4. ✖ 0.05 mm

Question Number : 47 Question Id : 7877322567 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the plasticity index of a soil lies above A-line, its permeability is

Options :

1. ✖ high

2. ✖ medium

3. ✖ low

4. ✔ very low

Question Number : 48 Question Id : 7877322568 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Negative pore water pressure can develop in

Options :

1. ✖ dense sands and normally consolidated clays

2. ✖ loose sands and normally consolidated clays

3. ✔ dense sands and over consolidated clays

4. ✖ loose sands and over consolidated clays

Question Number : 49 Question Id : 7877322569 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a consolidation test, the void ratio of a specimen of height 25 mm decreases from 1.0 to 0.90. The decrease in height will be

Options :

1. ✖ 2.5 mm

2. ✔ 1.25 mm

3. ✖ 0.25 mm

4. ✖

1.00 mm

Question Number : 50 Question Id : 7877322570 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the vertical stress directly below a point load at a depth z is σ_z, then the vertical stress directly below the point load at a depth $2z$ is

Options :

1. ✔ $0.25\ \sigma_z$

2. ✖ $0.50\ \sigma_z$

3. ✖ $1.0\ \sigma_z$

4. ✖ $2\ \sigma_z$

Question Number : 51 Question Id : 7877322571 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 4 m thick clay layer is submerged under 2 m of water. If the saturated unit weight of a clay is 20 kN/m^3, the total stress (σ) and effective stress (σ') at the bottom of the clay are (unit weight of water is 10 kN/m^3)

Options :

1. ✖ $\sigma = 60\ kN/m^2$ and $\sigma' = 40\ kN/m^2$

2. ✔ $\sigma = 100\ kN/m^2$ and $\sigma' = 40\ kN/m^2$

3. ✖ $\sigma = 40\ kN/m^2$ and $\sigma' = 100\ kN/m^2$

4. ✖ $\sigma = 80\ kN/m^2$ and $\sigma' = 20\ kN/m^2$

Question Number : 52 Question Id : 7877322572 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Permeability of a soil

Options :

1. ✔ increases with increase in degree of saturation and increase in temperature

2. ✖ decreases with decrease in degree of saturation and increase in temperature

3. ✖ increases with increase in degree of saturation and decrease in temperature

4. ✖ decreases with decrease in degree of saturation and decrease in temperature

Question Number : 53 Question Id : 7877322573 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The time factor corresponding to 20% consolidation is

Options :

1. ✔ $\pi/100$

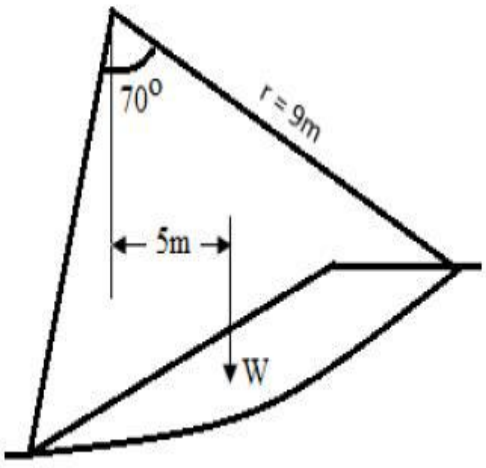
2. ✖ $\pi/20$

3. ✖ $\pi/400$

4. ✖ $\pi/200$

Question Number : 54 Question Id : 7877322574 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The factor of safety for the trial slip circle shown is (Weight of soil (W) = 350 kN/m, unit weight of soil is 18 kN/m^3 and c_u = 20 kN/m^2)



Options :

1. ✔ 1.1

2. ✖ 1.2

3. ✖ 1.5

4. ✖ 1.4

Question Number : 55 Question Id : 7877322575 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In an undrained triaxial test, a saturated clay sample failed at a deviator stress of 200 kN/m^2 when the cell pressure was 100 kN/m^2. The cohesion of the clay is

Options :

1. ✖ 200 kN/m^2

2. ✔ 100 kN/m^2

3. ✖ 300 kN/m^2

4. ✖ 150 kN/m^2

Question Number : 56 Question Id : 7877322576 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The total active thrust on a retaining wall 3 m high retaining a cohesionless horizontal backfill ($\gamma = 20$ kN/m^3, $\phi' = 30^0$) when the water table is at the bottom of the wall is

Options :

1. ✔ 30 kN/m

2. ✖ 35 kN/m

3. ✖ 40 kN/m

4. ✖ 45 kN/m

Question Number : 57 Question Id : 7877322577 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum dry density in a compaction test is lowest for

Options :

1. ✖ low plasticity silt

2. ✖ low plasticity clay

3. ✔ high plasticity clay

4. ✖ well graded sand

Question Number : 58 Question Id : 7877322578 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the gross bearing capacity of a strip footing 1.5 m wide located at a depth of 1 m in clay is 400 kN/m^2, its net bearing capacity for $\gamma = 20\ kN/m^3$ is

Options :

1. ✖ 370 kN/m^2

2. ✔ 380 kN/m^2

3. ✖ 390 kN/m^2

4. ✖ 360 kN/m^2

Question Number : 59 Question Id : 7877322579 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A pile of 0.5 m diameter and of length 10 m is embedded in a deposit of clay. The undrained strength parameters of the clay are cohesion = 70 kN/m^2 and the angle of internal friction = 0. The skin friction capacity (kN) of the pile for an adhesion factor of 0.6 is

Options :

1. ✖ 670

2. ✔ 660

3. ✖ 280

4. ✖ 170

Question Number : 60 Question Id : 7877322580 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Negative skin friction in a soil is considered when the pile is constructed through a

Options :

1. ✔ fill material

2. ✖ dense coarse sand

3. ✖ over consolidated stiff clay

4. ✖ dense fine sand

Question Number : 61 Question Id : 7877322581 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of dynamic viscosity to mass density is known as

Options :

1. ✖ viscosity

2. ✖ velocity gradient

3. ✔ kinematic viscosity

4. ✖ coefficient of viscosity

Question Number : 62 Question Id : 7877322582 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The SI unit of bulk modulus of elasticity is

Options :

1. ✖ N/mm^2

2. ✖ N/cm^2

3. ✔ N/m^2

4. ✖ N/kg-f

Question Number : 63 Question Id : 7877322583 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The excess pressure inside a liquid drop formed in the air, if radius of drop is 4 cm and surface tension of liquid is 40 dyne/cm is

Options :

1. ✔ $20\ dyne/cm^2$

2. ✖ $40\ dyne/cm^2$

3. ✖ $60\ dyne/cm^2$

4. ✖ $15\ dyne/cm^2$

Question Number : 64 Question Id : 7877322584 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water is flowing through a horizontal pipe of a non-uniform cross-section. At the extreme narrow portion of the pipe, the water will have

Options :

1. ✖ maximum pressure and least speed.

2. ✔ least pressure and maximum speed.

3. ✖ both pressure and speed maximum.

4. ✖ both pressure and speed minimum.

Question Number : 65 Question Id : 7877322585 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An imaginary curve drawn through a flowing fluid in such a way that the tangent to it at any point gives the direction of the velocity of flow at that point is called as

Options :

1. ✖ stream tube

2. ✔ stream line

3. ✖ path line

4. ✖ streak line

Question Number : 66 Question Id : 7877322586 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the Darcy-Weisbach equation for head loss in pipes, the friction factor f depends on

Options :

1. ✖ Reynolds number only

2. ✖ roughness of the pipe wall only

3. ✖ pipe diameter only

4. ✔ Reynolds number and roughness of the pipe wall

Question Number : 67 Question Id : 7877322587 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If x is the distance measured from the leading edge of flat plate, the laminar boundary layer thickness varies as

Options :

1. ✖ $1/x$

2. ✖ $x^{4/5}$

3. ✖ x^{2}

4. ✔ $x^{1/2}$

Question Number : 68 Question Id : 7877322588 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water flows in a rectangular channel with a width of 2 m and a depth of 1 m. The flow rate is 20 m^3/s. If acceleration due to gravity is 10 m/s^2, the specific energy of the flow is

Options :

1. ✖ 1.31 m

2. ✔ 2.25 m

3. ✖ 1.62 m

4. ✖ 2.15 m

Question Number : 69 Question Id : 7877322589 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ratio of the useful power output to the power supplied to the pump is known as

Options :

1. ✖ hydraulic efficiency

2. ✖ mechanical efficiency

3. ✔ overall efficiency

4. ✖ volumetric efficiency

Question Number : 70 Question Id : 7877322590 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A lysimeter is used to measure

Options :

1. ✖ infiltration

2. ✖ evaporation

3. ✔ evapotranspiration

4. ✖ radiation

Question Number : 71 Question Id : 7877322591 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A hyetograph is a graph representing

Options :

1. ✖ rainfall volume with time

2. ✔ rainfall intensity with time

3. ✖ rainfall volume with duration

4. ✖ rainfall intensity over an area

Question Number : 72 Question Id : 7877322592 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rainfall intensity over a catchment is 5 cm/hr. If the infiltration capacity of the soil is 3 cm/hr, the runoff coefficient of the catchment is

Options :

1. ✖ 0.8

2. ✔ 0.4

3. ✖ 0.6

4. ✖ 1.0

Question Number : 73 Question Id : 7877322593 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A storm of duration 5 hours gives a direct runoff of 4 cm and has an average intensity of 2 cm/hr. The value of ϕ-index is

Options :

1. ✔ 1.2

2. ✖ 1.6

3. ✖ 1.0

4. ✖ 1.4

Question Number : 74 Question Id : 7877322594 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

Options :

1. ✖ 110

2. ✖ 147

3. ✔ 135

4. ✖ 151

Question Number : 75 Question Id : 7877322595 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The 100-year flood peak discharge for a catchment is estimated to be 1500 m^3/s. The probability of this flood occurring in any given year is

Options :

1. ✔ 1%

2. ✖ 2%

3. ✖ 0.5%

4. ✖ 0.1%

Question Number : 76 Question Id : 7877322596 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The relationship between drawdown in a well and the distance from the well is

Options :

1. ✔ Drawdown decreases with increasing distance from the well

2. ✖ Drawdown increases with increasing distance from the well

3. ✖ Drawdown is independent of distance from the well

4. ✖ Drawdown varies randomly with distance from the well

Question Number : 77 Question Id : 7877322597 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The consumptive use of water for a crop during a particular stage of growth is 2.0 mm/day. The maximum depth of available water in the root zone is 60 mm. Irrigation is required when the amount of available water is 50% of the maximum available water in the root zone. Frequency of irrigation should be

Options :

1. ✖ 10 days

2. ✔ 15 days

3. ✖ 20 days

4. ✖ 25 days

Question Number : 78 Question Id : 7877322598 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dicken's formula predicts maximum flood discharge, Q, in terms of the area, A, and the coefficient, C, as $Q = CA^n$. The value of n is

Options :

1. ✖ 0.25

2. ✖ 0.50

3. ✖ 0.67

4. ✔ 0.75

Question Number : 79 Question Id : 7877322599 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Delta (Δ) in cm, duty (D) in hectare/cumec and base period (B) in days are related as

Options :

1. ✔ $\Delta = 864\ B/D$

2. ✖ $B = 864\ D/\Delta$

3. ✖ $B = 864\ \Delta/D$

4. ✖ $D = 8.64\ B/\Delta$

Question Number : 80 Question Id : 7877322600 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a gravity dam, the factor of safety against overturning should not be less than

Options :

1. ✖ 1.15

2. ✔ 1.5

3. ✖ 2.0

4. ✖ 3.0

Question Number : 81 Question Id : 7877322601 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A sprinkler irrigation system is suitable when

Options :

1. ✔ the land gradient is steep and the soil is easily erodible

2. ✖ the soil has low permeability

3. ✖ water table is low

4. ✖ the crops to be grown have deep roots

Question Number : 82 Question Id : 7877322602 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The major difference between border irrigation and basin irrigation is

Options :

1. ✖ basin irrigation is a type of surface irrigation, while border irrigation is a type of subsurface irrigation.

2. ✖ basin irrigation is a type of sprinkler irrigation, while border irrigation is a type of micro-irrigation.

3. ✔ basin irrigation involves flooding the entire field, while border irrigation involves dividing the field into strips.

4. ✖ border irrigation involves flooding the entire field, while basin irrigation involves dividing the field into strips.

Question Number : 83 Question Id : 7877322603 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Major projects of irrigation are those which have irrigation potential of more than

Options :

1. ✖ 5000 hectares

2. ✔ 10000 hectares

3. ✖ 20000 hectares

4. ✖ 30000 hectares

Question Number : 84 Question Id : 7877322604 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

High dissolved oxygen concentration in streams is

Options :

1. ✔ maximum at noon

2. ✖ minimum at noon

3. ✖ maximum at mid night

4. ✖ same throughout the day

Question Number : 85 Question Id : 7877322605 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Methemoglobinemia is caused by

Options :

1. ✖ Nitrites

2. ✖ Albuminoid nitrogen

3. ✔ Nitrates

4. ✖ Ammonia Nitrogen

Question Number : 86 Question Id : 7877322606 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If pH is greater than 8, hypochlorous acid dissociates into

Options :

1. ✖ chloramines

2. ✖ hypochloric ions

3. ✖ dichloramines

4. ✔ hypochlorite ions

Question Number : 87 Question Id : 7877322607 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

5% solution of sewage sample is incubated for 5 days at 20^0C. The dissolved oxygen concentration of the diluted sample at the beginning was 9 mg/l and at the end was 6 mg/l. The BOD of raw sewage is

Options :

1. ✔ 60 ppm

2. ✖ 180 ppm

3. ✖ 300 ppm

4. ✖ 420 ppm

Question Number : 88 Question Id : 7877322608 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per IS 10500-2012, acceptable and permissible limits of sulphates for drinking purpose are

Options :

1. ✖ 300 and 600 mg/l

2. ✔ 200 and 400 mg/l

3. ✖ 400 and 700 mg/l

4. ✖ 500 and 1000 mg/l

Question Number : 89 Question Id : 7877322609 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In softening process, regeneration of zeolite is done by

Options :

1. ✖ hydrochloric acid

2. ✖ sulphuric acid

3. ✔ sodium chloride

4. ✖ magnesium chloride

Question Number : 90 Question Id : 7877322610 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

With self-cleansing velocity in sewers

Options :

1. ✖ silting occurs at bottom

2. ✔ scouring occurs at bottom

3. ✖ both silting and scouring occur at bottom

4. ✖ neither silting nor scouring occur at bottom

Question Number : 91 Question Id : 7877322611 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a grit chamber, if the recommended velocity of flow is 0.2 m/s and detention period is 2 min, the length of tank is

Options :

1. ✔ 24 m

2. ✖ 16 m

3. ✖ 30 m

4. ✖ 20 m

Question Number : 92 Question Id : 7877322612 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For the survival of aquatic life/fish in a river, the minimum dissolved oxygen should be

Options :

1. ✖ 3 ppm

2. ✖ 5 ppm

3. ✔ 4 ppm

4. ✖ 6 ppm

Question Number : 93 Question Id : 7877322613 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Temporary hardness of water is caused by

Options :

1. ✖ carbonates of calcium and magnesium

2. ✔ carbonates and bi carbonates of calcium and magnesium

3. ✖ carbonates of nitrates and chlorides

4. ✖ bicarbonates of nitrates and chlorides

Question Number : 94 Question Id : 7877322614 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct relation between Theoretical Oxygen Demand (TOD), Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) is

Options :

1. ✖ TOD > BOD > COD

2. ✔ TOD > COD > BOD

3. ✖ BOD > COD > TOD

4. ✖ COD > BOD > TOD

Question Number : 95 Question Id : 7877322615 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In rapid sand filters, the ratio of length of each lateral to diameter of the lateral should not be greater than

Options :

1. ✖ 20

2. ✖ 45

3. ✔ 60

4. ✖ 75

Question Number : 96 Question Id : 7877322616 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For plain chlorination of water, quantity of chlorine required is

Options :

1. ✖ 0.1 mg/l

2. ✖ 0.2 mg/l

3. ✖ 0.3 mg/l

4. ✔ 0.5 mg/l

Question Number : 97 Question Id : 7877322617 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Gaussian model is used for prediction of the concentration of pollutants from

Options :

1. ✖ line source

2. ✖ plane source

3. ✖ double emission source

4. ✔ single emission source

Question Number : 98 Question Id : 7877322618 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The combined correction due to curvature and refraction (in m) for a distance of 1 km on the surface of the earth is

Options :

1. ✔ 0.0673

2. ✖ 0.673

3. ✖ 7.63

4. ✖ 0.763

Question Number : 99 Question Id : 7877322619 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The survey used to define property line is

Options :

1. ✖ topographical survey

2. ✖ city survey

3. ✖ land survey

4. ✔ cadastral survey

Question Number : 100 Question Id : 7877322620 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Least count of levelling staff is

Options :

1. ✔ 5 mm

2. ✖ 10 mm

3. ✖ 5 cm

4. ✖ 0.5 mm

Question Number : 101 Question Id : 7877322621 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An ideal vertical curve to join two gradients is

Options :

1. ✖ circular

2. ✖ hyperbolic

3. ✔ parabolic

4. ✖ elliptical

Question Number : 102 Question Id : 7877322622 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The coefficient of lateral friction as recommended by IRC is

Options :

1. ✔ 0.15

2. ✖ 0.20

3. ✖ 0.30

4. ✖ 0.35

Question Number : 103 Question Id : 7877322623 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The road geometrics in India are designed for the

Options :

1. ✖ 98^{th} highest hourly traffic volume

2. ✔ 30^{th} highest hourly traffic volume

3. ✖ 50^{th} highest hourly traffic volume

4. ✖ 85^{th} highest hourly traffic volume

Question Number : 104 Question Id : 7877322624 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The star and grid pattern of road network was adopted in

Options :

1. ✖ Lucknow road plan

2. ✖ Bombay road plan

3. ✖ Delhi road plan

4. ✔ Nagpur road plan

Question Number : 105 Question Id : 7877322625 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The average spacing between vehicles in a traffic stream is 50 m. The density of the stream is

Options :

1. ✖ 10 vehicles/km

2. ✔ 20 vehicles/km

3. ✖ 30 vehicles/km

4. ✖ 40 vehicles/km

Question Number : 106 Question Id : 7877322626 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The penetration test for bitumen is conducted at a temperature of

Options :

1. ✖ 60°C

2. ✖ 37°C

3. ✔ 25°C

4. ✖ 50°C

Question Number : 107 Question Id : 7877322627 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In cement concrete pavement dowel bars are used in

Options :

1. ✖ longitudinal joints

2. ✖ construction joints

3. ✖ dummy joints

4. ✔ expansion joints

Question Number : 108 Question Id : 7877322628 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Modulus of subgrade reaction is evaluated from

Options :

1. ✔ plate bearing test

2. ✖ CBR test

3. ✖ direct sear test

4. ✖ triaxial test

Question Number : 109 Question Id : 7877322629 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the total number of commercial vehicles per day ranges from 3000 to 6000, the minimum percentage of commercial traffic to be surveyed for axle load is

Options :

1. ✖ 30

2. ✖ 25

3. ✖ 20

4. ✔ 15

Question Number : 110 Question Id : 7877322630 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum value of 15 minute peak hour factor on a section of a road is

Options :

1. ✖ 0.10

2. ✖ 0.15

3. ✖ 0.20

4. ✔ 0.25

Question Number : 111 Question Id : 7877322631 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The infinite series $\sum_{n=1}^{\infty} 2^{2n}\, 3^{1-n}$

Options :

1. ✖ Converges to 1

2. ✖ Converges to $\frac{2}{3}$

3. ✔ Diverges

4. ✖ Converges to $\frac{4}{3}$

Question Number : 112 Question Id : 7877322632 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The value of $\iint_S F.ds$, where $F(x,y,z) = \sqrt{x^2+y^2+z^2}\,(x\,\boldsymbol{i} + y\,\boldsymbol{j} + z\,\boldsymbol{k})$ and S consists of the hemisphere $z = \sqrt{1-x^2-y^2}$ and the disk $x^2+y^2 \leq 1$ in the xy –plane is

Options :

1. ✔ 2π

2. ✖ π

3. ✖ $\frac{\pi}{2}$

4. ✖ 4π

Question Number : 113 Question Id : 7877322633 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shortest distance from the point $(2,0,-3)$ to the plane $x+y+z=1$ is

Options :

1. ✖ $\frac{4}{\sqrt{3}}$

2. ✖ $\frac{4}{3}$

3. ✖ $\frac{2}{3}$

4. ✔ $\frac{2}{\sqrt{3}}$

Question Number : 114 Question Id : 7877322634 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The solution of the equation $\frac{dy}{dx} = \cos(x - y)$ is

Options :

1. ✖ $y + \cos\left(\frac{x-y}{2}\right) = C$

2. ✔ $x + \cot\left(\frac{x-y}{2}\right) = C$

3. ✖ $x + \tan\left(\frac{x-y}{2}\right) = C$

4. ✖ $y + \cot\left(\frac{x+y}{2}\right) = C$

Question Number : 115 Question Id : 7877322635 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction

Time : 0

$\frac{d^3y}{dx^3} + 3\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + y = 0$ has

Options :

1. ✔ Three linearly independent solutions

2. ✖ Two linearly independent solutions

3. ✖ Four linearly independent solutions

4. ✖ No solution

Question Number : 116 Question Id : 7877322636 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let X be a normal random variable with mean μ and variance σ^2.

Then $P(\mu - 2\sigma < X \leq \mu + 2\sigma)$ is approximately (use $\varphi(2) = 0.9772$)

Options :

1. ✔ 0.9544

2. ✖ 0.9970

3. ✖ 0.9123

4. ✖ 0.9328

Question Number : 117 Question Id : 7877322637 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The probability that at least one of A and B occurs is 0.6. If A and B occur simultaneously with probability 0.3, then $P(A^c) + P(B^c)$ is

Options :

1. ✔ 1.1

2. ✖ 1.2

3. ✖ 1.0

4. ✖ 1.4

Question Number : 118 Question Id : 7877322638 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The system of linear equations $-y + z = 0, (4d - 1)x + y + z = 0, (4d - 1)z = 0$ has a nontrivial solution, if d equals

Options :

1. ✖ $\frac{1}{2}$

2. ✔ $\frac{1}{4}$

3. ✖ $\frac{3}{4}$

4. ✖ 1

Question Number : 119 Question Id : 7877322639 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the product of eigenvalues of the matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 5 & 2 \\ 1 & k & 2 \end{bmatrix}$ is -8, then the value of k will be

Options :

1. ✖ -3

2. ✖ 2

3. ✖ -2

4. ✔ 3

Question Number : 120 Question Id : 7877322640 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The quadrature formula $\int_0^3 f(x)dx = C_0 f(0) + C_1 f(x_1)$ is exact for polynomials of degree less than or equal to 2. Then the values of C_0, C_1 and x_1 are

Options :

1. ✔ $\frac{3}{4}, \frac{9}{4}, 2$

2. ✖ $\frac{1}{4}, \frac{3}{4}, 1$

3. ✖ $\frac{1}{4}, \frac{3}{4}, 2$

4. ✖ $\frac{3}{4}, \frac{9}{4}, 1$