Andhra Pradesh State Council of Higher Education

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Civil Engineering 19th July 2022 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
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View
Show Progress Bar? :	No

Civil Engineering

Section Id :	90030013
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

Question Number : 1 Question Id : 9003001441 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The bulk modulus of elasticity of a material is twice its modulus of rigidity.

The Poisson's ratio of the material is

Options :

1. ✖ 1/7

2. ✖ 3/7

3. ✔ 2/7

4. ✖ 4/7

Question Number : 2 Question Id : 9003001442 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the strain produced in length and diameter of a cylinder rod be 0.02 and 0.005 respectively, then the volumetric strain is

Options :

1. ✗ 0.015

2. ✗ 0.02

3. ✗ 0.025

4. ✓ 0.03

Question Number : 3 Question Id : 9003001443 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a body carries two unlike principal stresses, the maximum shear stress is

Options :

1. ✗ half the sum of the magnitude of principal stresses

2. ✓ half the difference of the magnitude of principal stresses

3. ✗ difference of the magnitude of principal stresses

4. ✗ sum of the magnitude of principal stresses

Question Number : 4 Question Id : 9003001444 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 maximum shear stress developed in a beam of rectangular section to that

of the average shear stress is

Options :

1. ✖ 4/3

2. ✖ 3/4

3. ✖ 2/3

4. ✔ 3/2

Question Number : 5 Question Id : 9003001445 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 having 5 m length is so loaded that it develops a shearing force of 20 t and a bending moment of 20 tm at a section 2 m from the free end. Maximum shearing force and maximum bending moment developed in the beam under this load are respectively 50 t and 125 tm. The load on the beam is

Options :

1. ✔ 10 t/m udl over entire length

2. ✖ 5 t concentrated load at free end and 2 t/m udl over entire length

3. ✖ 25 t concentrated load at free end

4. ✖ 20 t concentrated load at free end

Question Number : 6 Question Id : 9003001446 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response

Time : N.A Think Time : N.A Minimum Instruction Time : 0

A 10 m long beam carries point loads. When SF diagram is drawn, there are two rectangles of 10kN x 2m side; one is starting from one end and above the base line and the other is starting from the other end and below the base line. The BM at the center of the beam is

Options :

1. ✓ 20 kNm

2. ✗ 30 kNm

3. ✗ 40 kNm

4. ✗ 50 kNm

Question Number : 7 Question Id : 9003001447 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The shear center in a channel section with flange width 'b', web depth 'h' and moment of inertia 'I' is located at a distance of

Options :

1. ✗ $\frac{b^2h^3t}{4I}$

2. ✗ $\frac{b^2h^2t^2}{4I}$

3. ✓ $\frac{b^2h^2t}{4I}$

4. ✗ $\frac{b^3h^3t}{4I}$

Question Number : 8 Question Id : 9003001448 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Polar moment inertia of a circular section with radius 'R' is

Options :

1. ✗ $\frac{\pi R^3}{32}$

2. ✗ $\frac{\pi R^4}{32}$

3. ✗ $\frac{\pi R^4}{16}$

4. ✓ $\frac{\pi R^4}{2}$

Question Number : 9 Question Id : 9003001449 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Modulus of a section is the ratio of its

Options :

1. ✗ moment of inertia and extreme fibre distance from the soffit

2. ✓ moment of inertia and extreme fibre distance from the neutral axis

3. ✗ bending moment and moment of inertia

4. ✗ moment of inertia and bending moment

Question Number : 10 Question Id : 9003001450 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A steel column, pinned at both ends has a buckling load of 200 kN. If the column is restrained against lateral movement at its mid height, its buckling load will be

Options :

1. ✓ 800 kN

2. ✗ 600 kN

3. ✗ 400 kN

4. ✗ 200 kN

Question Number : 11 Question Id : 9003001451 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A thin cylindrical shell of diameter 20 mm and wall thickness 4 mm is subjected to an internal pressure of 100 MPa, the longitudinal stress developed in MPa is

Options :

1. ✗ 100

2. ✓ 125

3. ✗ 150

4. ✗ 175

Question Number : 12 Question Id : 9003001452 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A pin jointed frame with number of joints 'j' and number of members 'n' will be a

perfect frame. if

Options :

1. ✗ $n = 2j+3$

2. ✗ $n > 2j-3$

3. ✗ $n < 2j-3$

4. ✓ $n = 2j-3$

Question Number : 13 Question Id : 9003001453 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Static indeterminacy of a beam fixed at one end and hinged at the other end is equal to

Options :

1. ✗ 1

2. ✓ 2

3. ✗ 3

4. ✗ 4

Question Number : 14 Question Id : 9003001454 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When a single concentrated load '*W*' rolls along a simply supported girder of span '*l*'

from left to right, to the magnitude of absolute maximum bending moment is

Options :

1. ✗ *Wl*/8

2. ✗ *Wl*/6

3. ✓ *Wl*/4

4. ✗ *Wl*/2

Question Number : 15 Question Id : 9003001455 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The number of joint equilibrium equations available for the analysis of trusses is

Options :

1. ✓ 2

2. ✖ 3

3. ✖ 1

4. ✖ 4

Question Number : 16 Question Id : 9003001456 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Fixed end moment of a fixed beam of span '*l*' with a concentrated load '*P*' in the mid span is

Options :

1. ✖ *Pl*/4

2. ✖ *Pl*/6

3. ✔ *Pl*/8

4. ✖ *Pl*/2

Question Number : 17 Question Id : 9003001457 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Stiffness factor of the beam of span '*l*' and flexural rigidity '*EI*' with far end pinned

or roller supported is

Options :

1. ✖ EI/L

2. ✖ 2EI/L

3. ✔ 3EI/L

4. ✖ 4EI/L

Question Number : 18 Question Id : 9003001458 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

According to IS:456-2000, the maximum cement content (kg/m^3) that can be used in concrete work is

Options :

1. ✖ 550

2. ✔ 450

3. ✖ 350

4. ✖ 250

Question Number : 19 Question Id : 9003001459 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The limiting moment of resistance of a singly reinforced rectangular beam with M20 concrete and HYSD steel of grade Fe415 is

Options :

1. ✖ $1.498\ bd^2$

2. ✖ $2.676\ bd^2$

3. ✖ $2.996\ bd^2$

4. ✔ $2.776\ bd^2$

Question Number : 20 Question Id : 9003001460 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a beam with 400 mm effective depth and 200 mm neutral axis depth, the value of lever arm is

Options :

1. ✔ 316 mm

2. ✖ 348 mm

3. ✖ 326 mm

4. ✖ 338 mm

Question Number : 21 Question Id : 9003001461 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a T- beam of span 10 m, web thickness 300 mm and flange thickness 120 mm, spaced at 3 m, the effective width of flange is

Options :

1. ✖ 2.39 m

2. ✖ 2.56 m

3. ✔ 2.68 m

4. ✖ 3 m

Question Number : 22 Question Id : 9003001462 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In limit state design, permissible bond stress in the case of deformed bars is more than that in plain bars by

Options :

1. ✖ 25 %

2. ✖ 40%

3. ✖ 50%

4. ✔ 60%

Question Number : 23 Question Id : 9003001463 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 adoptable maximum spacing between vertical stirrups in an RCC beam of rectangular cross section having an effective depth of 300 mm?

Options :

1. ✔ 225 mm

2. ✖ 250 mm

3. ✖ 275 mm

4. ✖ 300 mm

Question Number : 24 Question Id : 9003001464 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The nominal maximum permissible size of aggregate in a 120 mm thick concrete slab is

Options :

1. ✖ 10

2. ✖ 20

3. ✖ 25

4. ✔ 30

Question Number : 25 Question Id : 9003001465 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In uncracked reinforced concrete columns, the actual bending compressive stress is

Options :

1. ✖ $\frac{M}{Bjd^2}$

2. ✗ $\frac{M}{Z}$

3. ✓ $\frac{P}{A_C+1.5mA_{sc}}$

4. ✗ $\frac{M}{A_C+1.5mA_{sc}}$

Question Number : 26 Question Id : 9003001466 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In the limit state of serviceability, the deflection after erection of partitions and application of finishes is restricted to

Options :

1. ✓ Span /350

2. ✗ Span/250

3. ✗ Span/225

4. ✗ Span/150

Question Number : 27 Question Id : 9003001467 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The minimum longitudinal reinforcement in post tensioned concrete sections as a percentage of cross sectional area should not be less than

Options :

1. ✗ 0.12

2. ✓ 0.2

3. ✗ 0.15

4. ✗ 0.25

Question Number : 28 Question Id : 9003001468 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 autogenous shrinkage strain for M35 grade concrete is

Options :

1. ✗ 95×10^{-6}

2. ✗ 75×10^{-6}

3. ✗ 65×10^{-6}

4. ✓ 45×10^{-6}

Question Number : 29 Question Id : 9003001469 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The maximum slenderness ratio permissible in steel ties which may be subjected to compression under wind load condition is

Options :

1. ✗ 250

2. ✓ 350

3. ✗ 400

4. ✗ 180

Question Number : 30 Question Id : 9003001470 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A steel plate is 30 cm wide and 10 mm thick. What is the net sectional area of the plate

if a bolt of nominal diameter 18 mm is used for connection?

Options :

1. ✓ 28 cm^2

2. ✗ 28.2 cm^2

3. ✗ 18 cm^2

4. ✗ 32.42 cm^2

Question Number : 31 Question Id : 9003001471 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Rolled steel beams are designated by Indian standards in terms of

Options :

1. ✗ weight per meter and width of flange

2. ✗ width of flange and weight per meter

3. ✗ weight per meter and depth of section

4. ✓ depth of section and weight per meter

Question Number : 32 Question Id : 9003001472 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A joint is called as long joint, if the length of joint exceeds (d= nominal diameter of fastener)

Options :

1. ✗ 5d

2. ✗ 10d

3. ✓ 15d

4. ✗ 20d

Question Number : 33 Question Id : 9003001473 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Prying forces are

Options :

1. ✗ shearing forces on the bolts because of joints

2. ✓ tensile forces due to the flexibility of connected parts

3. ✗ bending forces on the bolts because of joints

4. ✗ forces due to friction between connected parts

Question Number : 34 Question Id : 9003001474 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Minimum thickness of lacing bar for double lacing is

Options :

1. ✗ effective length /30

2. ✗ effective length /40

3. ✗ effective length /50

4. ✓ effective length /60

Question Number : 35 Question Id : 9003001475 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Shape factor of a rectangular section with width 'b' and depth 'd' is

Options :

1. ✗ 0.5

2. ✗ 0.75

3. ✗ 1

4. ✔ 1.5

Question Number : 36 Question Id : 9003001476 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The collapse load of a fixed beam of span 'L' with a concentrated load at mid span is

('M_p' being the plastic moment)

Options :

1. ✔ $4M_p/L$

2. ✘ $6M_p/L$

3. ✘ $8M_p/L$

4. ✘ $10M_p/L$

Question Number : 37 Question Id : 9003001477 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A soil having particles of nearly the same size is known as

Options :

1. ✘ well graded

2. ✔ uniformly graded

3. ✘ poorly graded

4. ✗ gap graded

Question Number : 38 Question Id : 9003001478 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following is not correct

Options :

1. ✗ $e = \frac{n}{n-1}$

2. ✗ $\gamma_{sat} = \frac{G+e}{1+e}\gamma_w$

3. ✓ $n = \frac{e}{1-e}$

4. ✗ $e = \frac{wG}{S}$

Question Number : 39 Question Id : 9003001479 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the volume of voids and the volume of solids is equal in any soil, the porosity and

void ratio are respectively,

Options :

1. ✗ 1 & 0

2. ✗ 0 & 1

3. ✓ 0.5 & 1

4. ✗ 1 & 0.5

Question Number : 40 Question Id : 9003001480 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Indian Standard Soil Classification System (ISSCS) classifies the soil into

Options :

1. ✗ 12 groups

2. ✗ 15 groups

3. ✓ 18 groups

4. ✗ 12 groups

Question Number : 41 Question Id : 9003001481 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Microscopic soil particles have a

Options :

1. ✓ larger specific surface

2. ✗ larger volume

3. ✗ smaller specific surface

4. ✖ larger diameter

Question Number : 42 Question Id : 9003001482 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Water content of soil can

Options :

1. ✖ never be greater than 100%

2. ✖ takes value from 0% to 100%

3. ✖ be less than 0%

4. ✔ be greater than 100 %

Question Number : 43 Question Id : 9003001483 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A clay sample has a void ratio 0.54 in dry state. The specific gravity of soil solids is 2.7.

The shrinkage limit of the soil is

Options :

1. ✖ 8.5 %

2. ✖ 10 %

3. ✖ 17 %

4. ✔ 20 %

Question Number : 44 Question Id : 9003001484 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $C_c = 1$ and $C_u = 4$, then the value of $\frac{D_{10}}{D_{30}}$ is

Options :

1. ✖ 4

2. ✖ 1.75

3. ✔ 0.50

4. ✖ 2.0

Question Number : 45 Question Id : 9003001485 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A river 5 m deep consists of a sand bed with saturated unit weight of 20 kN/m^3.

If $\gamma_w = 10\ kN/m^3$, the effective vertical stress at 5m below the top of sand bed is

Options :

1. ✖ 10 kN/m^2

2. ✔ 50 kN/m^2

3. ✖ 20 kN/m^2

4. ✗ $40\ kN/m^2$

Question Number : 46 Question Id : 9003001486 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A line load of infinite length has an intensity 'q' per unit length. The vertical stress 'σ_z' at a depth 'z' below the earth at the center of the load is

Options :

1. ✗ $\sigma_z = \frac{2qz}{\pi}$

2. ✓ $\sigma_z = \frac{2q}{\pi z}$

3. ✗ $\sigma_z = \frac{2qz^2}{\pi}$

4. ✗ $\sigma_z = \frac{2q}{\pi z^2}$

Question Number : 47 Question Id : 9003001487 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The contact pressure for flexible footing on any type of soil (sand or clay) is

Options :

1. ✓ uniform

2. ✗ varies with maximum at center

3. ✖ varies with maximum at edges

4. ✖ no specific trend of variation

Question Number : 48 Question Id : 9003001488 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A clay deposit of thickness 10 cm and void ratio 0.5 undergoes settlement and attains a final void ratio of 0.2. The settlement undergone (in cm) is

Options :

1. ✖ 1.0

2. ✖ 1.5

3. ✔ 2.0

4. ✖ 2.5

Question Number : 49 Question Id : 9003001489 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a triaxial test at failure, major principal stress was 180 kPa and minor principal stress was 100 kPa. The pore water pressure was 20 kPa. The sine of the angle of shearing resistance of the sandy soil tested is

Options :

1. ✔ $\frac{1}{3}$

2. ✖ $\frac{2}{7}$

3. ✖ $\frac{1}{2}$

4. ✖ $\frac{1}{6}$

Question Number : 50 Question Id : 9003001490 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Unconfined compressive strength test is

Options :

1. ✔ undrained test

2. ✖ drained test

3. ✖ consolidated undrained test

4. ✖ consolidated drained test

Question Number : 51 Question Id : 9003001491 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The appropriate field test to determine the undrained shear strength of soft clay is

Options :

1. ✗ direct shear test

2. ✓ vane shear test

3. ✗ static cone penetration test

4. ✗ standard penetration test

Question Number : 52 Question Id : 9003001492 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Surcharge loading required to be placed on the horizontal back fill of a smooth vertical retaining wall so as to eliminate tensile crack is

Options :

1. ✗ $2c$

2. ✗ $2cK_a$

3. ✗ $2c\sqrt{K_a}$

4. ✓ $\frac{2c}{\sqrt{K_a}}$

Question Number : 53 Question Id : 9003001493 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Compression index of soil helps to determine

Options :

1. ✗ total time for consolidation

2. ✗ time required for 50 % consolidation

3. ✓ total settlement for clay layer

4. ✗ pre-consolidation pressure of clay

Question Number : 54 Question Id : 9003001494 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a certain loading condition, a saturated clay layer undergoes 40% consolidation in a period of 200 days. The additional time required for further 20% consolidation to occur is

Options :

1. ✓ 250 days

2. ✗ 450 days

3. ✗ 150 days

4. ✗ 200 days

Question Number : 55 Question Id : 9003001495 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A square pile of section 30 cm × 30 cm and length 10 m penetrates a deposit of clay having c = 5 kN/m^2 and the mobilizing factor α = 0.8. The load carried by the pile by skin friction only is

Options :

1. ✗ 192 kN

2. ✗ 75 kN

3. ✗ 60 kN

4. ✓ 48 kN

Question Number : 56 Question Id : 9003001496 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The ultimate bearing capacity of a soil is 320 kN/m^2. The depth of foundation is 1 m and unit weight of soil is 20 kN/m^3. Choosing a factor of safety of 3, the net ultimate bearing capacity is

Options :

1. ✓ 100 kN/m^2

2. ✗ 112 kN/m^2

3. ✗ 80 kN/m^2

4. ✗ 300 kN/m^2

Question Number : 57 Question Id : 9003001497 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Likelihood of general shear failure for an isolated footing on sand decreases with

Options :

1. ✗ decreasing footing depth

2. ✓ decreasing intergranular packing of sand

3. ✗ increasing footing width

4. ✗ decreasing soil grain compressibility

Question Number : 58 Question Id : 9003001498 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If a hammer is raised by steam and allowed to fall by gravity on top of the pile, the hammer is called as

Options :

1. ✗ diesel hammer

2. ✗ vibratory hammer

3. ✓ single acting hammer

4. ✗ drop hammer

Question Number : 59 Question Id : 9003001499 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dynamic formulae are best suited for

Options :

1. ✗ fine grained soil

2. ✓ coarse grained soil

3. ✗ cohesive soil

4. ✗ any soil

Question Number : 60 Question Id : 9003001500 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The test which is used for separating the load carried by the pile into skin load and point load is

Options :

1. ✓ cyclic load test

2. ✗ plate load test

3. ✗ penetration test

4. ✗ static cone penetration test

Question Number : 61 Question Id : 9003001501 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The most commonly used sampler for obtaining a disturbed sample of soil is

Options :

1. ✓ split spoon sampler

2. ✗ rotary sampler

3. ✗ piston sampler

4. ✗ shelby tube sampler

Question Number : 62 Question Id : 9003001502 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Dynamic viscosity has the dimensions

Options :

1. ✗ M/LT^2

2. ✗ M/T^2

3. ✓ M/LT

4. ✗ M/L^2T^2

Question Number : 63 Question Id : 9003001503 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The height of liquid in a capillary tube

Options :

1. ✗ increases with an increase in diameter

2. ✓ increases with a decrease in diameter

3. ✗ decreases with an increase in surface tension

4. ✗ increases with an increase in specific weight

Question Number : 64 Question Id : 9003001504 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For laminar flow in pipes, the momentum correction factor is

Options :

1. ✗ less than 1

2. ✗ 1.03

3. ✗ 2.0

4. ✓ 1.33

Question Number : 65 Question Id : 9003001505 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The hydraulic grade line is

Options :

1. ✓ the velocity head below the energy grade line

2. ✗ always above the energy grade line

3. ✗ always above the closed conduit

4. ✗ always sloping in the direction of flow

Question Number : 66 Question Id : 9003001506 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Boundary layer separation is caused by

Options :

1. ✗ the reduction of pressure below the vapour pressure

2. ✗ an adverse pressure gradient

3. ✓ reduction of pressure gradient to zero

4. ✗ the boundary layer thickness reducing to zero value

Question Number : 67 Question Id : 9003001507 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Critical depth in a channel is expressed by

Options :

1. ✓ $(Q^2T/gA^3) = 1$

2. ✗ $(QT^2/gA^3) = 1$

3. ✗ $(QT/gA^3) = 1$

4. ✗ $(Q^2A^3/gT^3) = 1$

Question Number : 68 Question Id : 9003001508 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Hydraulic jump is used for

Options :

1. ✗ increasing the depth of flow

2. ✗ reducing turbulence

3. ✗ decreasing the velocity of flow

4. ✓ reducing the energy of flow

Question Number : 69 Question Id : 9003001509 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The following are the rates of rainfall (intensity of rainfall) for successive 20 min period of a 140 min storm 2.5, 2.5, 10.0, 7.50, 1.25, 1.25, 5.0 cm/hr. Taking the value of ϕ-index at 3.2 cm/hr, the net runoff in cm is

Options :

1. ✖ 43

2. ✖ 58

3. ✔ 4.3

4. ✖ 5.8

Question Number : 70 Question Id : 9003001510 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The peak ordinate of a flood hydrograph produced by a 4-hour storm yielding 6.0 cm of rainfall is observed to be 820 m^3/s. If the base flow and ϕ-index are 20 m^3/s and 0.5 cm/hr, what is the peak ordinate (m^3/s) of the 4 hour unit hydrograph?

Options :

1. ✔ 200

2. ✖ 150

3. ✖ 100

4. ✖ 300

Question Number : 71 Question Id : 9003001511 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A catchment area of 200 hectare has a run-off coefficient of 0.5. A storm of duration larger than the time of concentration of the catchment and of intensity 3.6 cm/h causes a peak discharge (m^3/s) of

Options :

1. ✖ 5

2. ✔ 10

3. ✖ 100

4. ✖ 360

Question Number : 72 Question Id : 9003001512 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

$ML^{-1}T^{-2}$ is the dimension of

Options :

1. ✖ Force

2. ✖ Energy

3. ✖ Power

4. ✔ Pressure

Question Number : 73 Question Id : 9003001513 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The force scale ratio for Reynold's model law using the same fluid in model and prototype is

Options :

1. ✓ 1

2. ✗ L_r^2

3. ✗ L_r^3

4. ✗ $L_r^{5/2}$

Question Number : 74 Question Id : 9003001514 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A turbine where in entire total energy of water available is converted to kinetic energy is called

Options :

1. ✗ Reaction turbine

2. ✗ Mixed flow turbine

3. ✓ Impulse turbine

4. ✗ Axial flow turbine

Question Number : 75 Question Id : 9003001515 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The depth of immersion of a vertical plane surface increases, the location of center of pressure

Options :

1. ✗ moves away to the center of gravity of the area

2. ✓ falls closer to the center of gravity of the area

3. ✗ ultimately coincides with center of gravity of the area

4. ✗ falls much below the center of gravity of the area.

Question Number : 76 Question Id : 9003001516 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a hydro-electric project with reaction turbine, the draft tube at the exit from the turbine is

Options :

1. ✓ always immersed in water

2. ✗ always above the water

3. ✗ may either be above or below the water

4. ✗ above or below the water depending on the unit speed of the turbine.

Question Number : 77 Question Id : 9003001517 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The inlet length of a venturi meter

Options :

1. ✗ is equal to the outlet length

2. ✗ is more than the outlet length

3. ✗ is more than or equal to outlet length

4. ✓ is less than the outlet length

Question Number : 78 Question Id : 9003001518 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The point, through which the buoyant force is acting, is called

Options :

1. ✗ center of pressure

2. ✗ center of gravity

3. ✓ center of buoyancy

4. ✗ center of mass

Question Number : 79 Question Id : 9003001519 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The standard recording rain gauge adopted in India is of

Options :

1. ✗ weighing bucket type

2. ✓ natural siphon type

3. ✗ tipping bucket type

4. ✗ telemetry type

Question Number : 80 Question Id : 9003001520 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Double mass curve technique is adopted to

Options :

1. ✓ check the consistency of rain gauge records

2. ✗ to find the average rainfall over a number of years

3. ✗ to find the number of rain gauges required

4. ✗ to estimate the missing rainfall data

Question Number : 81 Question Id : 9003001521 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If 'e_w' and 'e_a' are the saturated vapour pressures of the water surface and air respectively, the Dalton's law for evaporation 'E_L' in unit time is given by

Options :

1. ✗ $E_L = (e_w - e_a)$

2. ✗ $E_L = K\, e_w\, e_a$

3. ✓ $E_L = K(e_w - e_a)$

4. ✗ $E_L = K(e_w + e_a)$

Question Number : 82 Question Id : 9003001522 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A flat plate of area $1x10^6$ mm^2 is pulled with a speed of 0.10 m/s relative to another plate located at a distance of 0.10 mm from it. The force(N) required to maintain this speed if the fluid separating them is having viscosity as 1 poise is

Options :

1. ✗ 1000

2. ✓ 100

3. ✗ 9810

4. ✗ 9.81

Question Number : 83 Question Id : 9003001523 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the work done by a pump is 275.42 Nm/s, the power required to drive the pump in kW is

Options :

1. ✖ 27.54

2. ✖ 275.4

3. ✔ 0.2754

4. ✖ 2754

Question Number : 84 Question Id : 9003001524 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the dynamic viscosity of a fluid is 8.63 poise, the kinematic viscosity of the fluid in Ns/m^2 is

Options :

1. ✖ 86.30

2. ✔ 0.863

3. ✖ 863

4. ✖ 8630

Question Number : 85 Question Id : 9003001525 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The GCA of an irrigation canal is 50000 ha., out of which 80% is CCA. The intensity of irrigation for Rabi season is 60% and that for Kharif is 20%. The crop ratio is

Options :

1. ✖ 6

2. ✖ 1.5

3. ✖ 4.5

4. ✔ 3

Question Number : 86 Question Id : 9003001526 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The concentration of exchangeable sodium ions in medium-sodium water (S_2) is

Options :

1. ✖ 0-10

2. ✖ 18-26

3. ✖ 15-24

4. ✔ 10-18

Question Number : 87 Question Id : 9003001527 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Zero hardness of water is achieved by

Options :

1. ✗ using lime soda process

2. ✗ excess lime treatment

3. ✓ zeolite / Ion exchange Process

4. ✗ using excess alum dosage

Question Number : 88 Question Id : 9003001528 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

8 kg of chlorine is consumed per day to treat 20 million liters of water. The residual chlorine after 10 min contact is 0.2 mg/l. The chlorine demand of water is

Options :

1. ✗ 0.8 mg/l

2. ✗ 0.6 mg/l

3. ✗ 0.4 mg/l

4. ✓ 0.2 mg/l

Question Number : 89 Question Id : 9003001529 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Ratio of BOD/COD for untreated waste water varies from

Options :

1. ✔ 0.3 – 0.8

2. ✖ 0.4 – 0.6

3. ✖ 0.1 – 0.3

4. ✖ 1.2 – 2.0

Question Number : 90 Question Id : 9003001530 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

An example for attached growth process is

Options :

1. ✖ activated sludge process

2. ✖ sludge digestion systems

3. ✖ aerated lagoons

4. ✔ trickling filters

Question Number : 91 Question Id : 9003001531 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Initial DO of the sample is 10 mg/l, final DO of the sample is 2 mg/l and the dilution is 1%. Then the BOD of given sewage sample is

Options :

1. ✖ 8 mg/l

2. ✖ 10 mg/l

3. ✖ 100 mg/l

4. ✔ 800 mg/l

Question Number : 92 Question Id : 9003001532 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Which one of the following sewage treatment units has a Parshall flume?

Options :

1. ✖ trickling filter

2. ✖ oxidation ditch

3. ✔ grit chamber

4. ✖ aerated lagoon

Question Number : 93 Question Id : 9003001533 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In conventional activated sludge process, MLSS is generally kept in the range

Options :

1. ✗ < 100 mg/l

2. ✗ 1000 – 2000 mg/l

3. ✓ 1500 – 3000 mg/l

4. ✗ 3000 – 5000 mg/l

Question Number : 94 Question Id : 9003001534 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following which is not a secondary air pollutant?

Options :

1. ✗ sulphuric acid

2. ✗ ozone

3. ✗ formaldehyde

4. ✓ carbon monoxide

Question Number : 95 Question Id : 9003001535 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The major source of carbon monoxide in the environment is due to

Options :

1. ✗ decomposition of organics

2. ✗ chemical reaction between VOC and NO_x

3. ✓ incomplete combustion of carbonaceous fuels

4. ✗ incomplete combustion in the presence of sunlight

Question Number : 96 Question Id : 9003001536 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

When sewage is disposed into a stream, minimum DO will be found in

Options :

1. ✗ zone of degradation

2. ✓ zone of active decomposition

3. ✗ zone of recovery

4. ✗ zone of clear water

Question Number : 97 Question Id : 9003001537 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Among the following, which is not a method to control gaseous pollutants?

Options :

1. ✗ adsorption

2. ✖ absorption

3. ✔ electrostatic precipitators

4. ✖ incineration

Question Number : 98 Question Id : 9003001538 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 in waste water treatment is an additive process?

Options :

1. ✖ Physical unit operations

2. ✔ Chemical unit processes

3. ✖ Biological unit processes

4. ✖ Biological unit operations

Question Number : 99 Question Id : 9003001539 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For a single lane traffic. the desirable width of carriage way is

Options :

1. ✖ 3.50 m

2. ✔ 3.75 m

3. ✗ 2.50 m

4. ✗ 3.00 m

Question Number : 100 Question Id : 9003001540 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Based on location and function, Nagpur road plan has classified the roads in India in to

Options :

1. ✗ 2 categories

2. ✗ 4 categories

3. ✓ 5 categories

4. ✗ 6 categories

Question Number : 101 Question Id : 9003001541 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

On horizontal curve, if the pavement is kept horizontal across the alignment, then the pressure on the outer wheels will be

Options :

1. ✓ more than the pressure under inner wheels

2. ✗ less than the pressure under inner wheels

3. ✗ equal to the pressure under inner wheels

4. ✗ zero

Question Number : 102 Question Id : 9003001542 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

As per IRC, the super elevation to be provided in horizontal curves of radius R is given by

Options :

1. ✗ $V^2/127R$

2. ✗ $V^2/175R$

3. ✓ $V^2/225R$

4. ✗ $(V+8)^2/127R$

Question Number : 103 Question Id : 9003001543 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the load, warping and frictional stresses in a cement concrete slab are 210 MPa, 290 MPa and 10 MPa respectively, the critical combination of stresses during summer mid-day is

Options :

1. ✗ 290 MPa

2. ✗ 390 MPa

3. ✓ 490 MPa

4. ✗ 590 MPa

Question Number : 104 Question Id : 9003001544 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

In a linear speed density model, the design speed is 60 kmph. At jam condition, spacing between vehicles is 8m. Capacity of the road in vehicles/hour is

Options :

1. ✗ 1800 vehicles/hour

2. ✗ 1825 vehicles/hourn

3. ✗ 1850 vehicles/hour

4. ✓ 1875 vehicles/hour

Question Number : 105 Question Id : 9003001545 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Marshall flow value is expressed in units of

Options :

1. ✗ 3 mm

2. ✗ 5 mm

3. ✓ 0.25 mm

4. ✗ 25 mm

Question Number : 106 Question Id : 9003001546 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Bitumen grade 80/100 indicates that under the standard test conditions, penetration value of bitumen would vary from

Options :

1. ✓ 8 to 10 mm

2. ✗ 0.8 to 1 mm

3. ✗ 8 to 10 cm

4. ✗ 8 to 1 m

Question Number : 107 Question Id : 9003001547 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The rise and fall method provides an arithmetic check on

Options :

1. ✗ back sights and fore sights

2. ✖ intermediate sights

3. ✖ backsights and intermediate sights

4. ✔ back sights, intermediate sights and fore sights

Question Number : 108 Question Id : 9003001548 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If the horizontal distance between the staff point and the observation point is '*d*', then

the error due to curvature of earth is proportional to

Options :

1. ✖ d

2. ✖ $1/d$

3. ✔ d^2

4. ✖ $1/d^2$

Question Number : 109 Question Id : 9003001549 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The correct meaning of the term level line in surveying is

Options :

1. ✔ the line parallel to the mean spheroidal surface of the earth

2. ✗ the horizontal line

3. ✗ the line passing through the center of cross hairs and the center of the eye piece

4. ✗ the line passing through the objective lens and the eye piece of a dumpy or tilting level

Question Number : 110 Question Id : 9003001550 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The method of theodolite traversing suitable for locating the details which are far away from transit stations is

Options :

1. ✗ measuring angle and distance from one transit station

2. ✓ measuring angles to the point from at least two stations

3. ✗ measuring angle at one station and distance from the other

4. ✗ measuring distance from two points on traverse line

Question Number : 111 Question Id : 9003001551 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

For what values of a and b the equations $x+2y+3z = 4$, $x+3y+4z = 5$, $x+3y+az = b$ has a unique solution

Options :

1. ✗ $a = 4, b = 5$

2. ✗ $a = 4, b \neq 5$

3. ✗ $a = 5, b = 4$

4. ✓ $a \neq 4, b = 5$

Question Number : 112 Question Id : 9003001552 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Eigen values of the matrix $\begin{bmatrix} 2 & 2 & -7 \\ 2 & 1 & 2 \\ 0 & 1 & -3 \end{bmatrix}$ are

Options :

1. ✓ 1, 3, - 4

2. ✗ 1, 4, - 3

3. ✗ 1, 2, - 3

4. ✗ -1, -3, 4

Question Number : 113 Question Id : 9003001553 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 Cauchy's mean value theorem for $f(x) = e^x$ and $g(x) = e^{-x}$ defined on $[a, b]$, $0 < a < b$ is

Options :

1. ✗ $(a-b)/2$

2. ✗ $\sqrt{(ab)}$

3. ✓ $(a+b)/2$

4. ✗ $2ab/(a+b)$

Question Number : 114 Question Id : 9003001554 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Value of normal vector to the surface $x^2 + y^2 + 2z^2 = 26$ at the point (2, 2, 3)

Options :

1. ✓ $4(i + j + 3k)$

2. ✗ $4(i + j) + 3k$

3. ✗ $i + 4(j + 3k)$

4. ✗ $4(i + j - 3k)$

Question Number : 115 Question Id : 9003001555 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $\frac{d^2y}{dx^2} - y = 0$

Options :

1. ✗ $y = C_1Cosx + C_2Sinx$

2. ✗ $y = C_1Cosx - C_2Sinx$

3. ✓ $y = C_1 e^{x} + C_2 e^{-x}$

4. ✗ $y = C_1 e^{x} - C_2 e^{-x}$

Question Number : 116 Question Id : 9003001556 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

General Solution of $(y-px)(p-1) = p$

Options :

1. ✓ $y = cx + \frac{c}{c-1}$

2. ✗ $y = cx - \frac{c}{c-1}$

3. ✗ $y = cx + \frac{c}{c+1}$

4. ✗ $y = cx - \frac{c}{c+1}$

Question Number : 117 Question Id : 9003001557 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Let $f(z) = \frac{Cos\pi z^2}{(z-1)(z-2)}$, and C: $|z| = 3$. The value of $\int_c f(z)dz$ is

Options :

1. ✓ $4\pi i$

2. ✗ $-4\pi i$

3. ✗ $2\pi i$

4. ✗ $-2\pi i$

Question Number : 118 Question Id : 9003001558 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

If $f(z) = \frac{e^{2z}}{(z-1)^2}$, then the Residue at $z = 2$ is

Options :

1. ✗ πe^4

2. ✗ $\pi i e^4$

3. ✓ $2e^4$

4. ✗ $-2e^4$

Question Number : 119 Question Id : 9003001559 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

A die is thrown 8 times. The Probability that 3 turns up exactly 2 times is

Options :

1. ✔ .25

2. ✘ .3

3. ✘ .41

4. ✘ .59

Question Number : 120 Question Id : 9003001560 Display Question Number : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

The Iterative formula for $\sqrt{N}$ by Newton's method is

Options :

1. ✘ $1/2\,(x_n - N/x_n)$

2. ✔ $1/2\,(x_n + N/x_n)$

3. ✘ $1/2\,(x_n - Nx_n)$

4. ✘ $1/2\,(x_n + Nx_n)$