

Question Paper Name: COMMON FOR CIVIL AND MECHANICAL ENGINEERING
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COMMON FOR CIVIL AND MECHANICAL ENGINEERING

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COMMON FOR CIVIL AND MECHANICAL ENGINEERING

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Sub-Section Number: 1
Sub-Section Id: 57996520
Question Shuffling Allowed : Yes

**Question Number : 1 Question Id : 5799651378 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0**

The resultant of two perpendicular forces each equal to $P/2$ will be equal to

Options :

$\frac{P}{\sqrt{2}}$

$\sqrt{2}P$

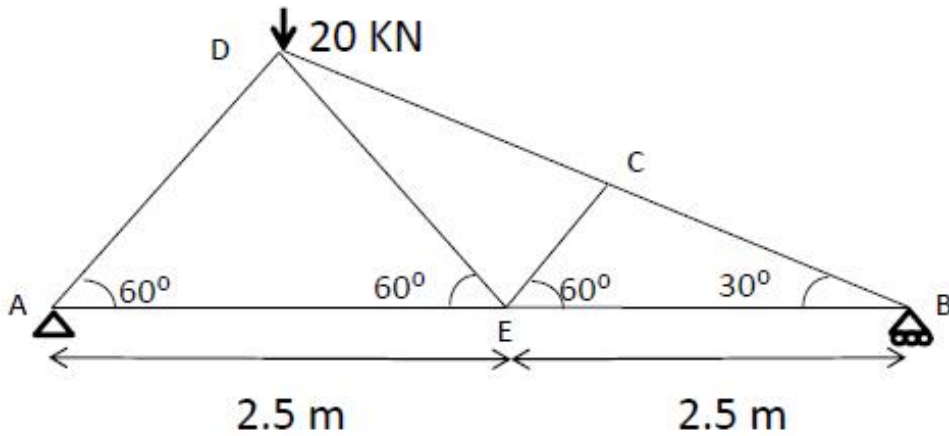
2P

$\sqrt{2}P$

Question Number : 2 Question Id : 5799651379 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The axial forces in the members CE and DE of the plane truss shown in the figure below are equal to



Options :

10, 10 in KN

20, 20 in KN

8.7, 8.7 in KN

0, 0

Question Number : 3 Question Id : 5799651380 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If two concurrent forces P and Q having an angle of α between them, then the direction of their resultant defined by angle θ with reference to the direction of P is given by $\tan \theta$ which is equal to

Options :

$$\frac{Q \sin \alpha}{P + Q \cos \alpha}$$

$$\frac{P \sin \alpha}{Q + P \cos \alpha}$$

$$\frac{P \sin \alpha}{Q + Q \cos \alpha}$$

$$\frac{Q \sin \alpha}{P + P \cos \alpha}$$

Question Number : 4 Question Id : 5799651381 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The maximum angle of inclination of the plane (with horizontal) at which a body remains in equilibrium under the action of friction only is termed as

Options :

Angle of wedge

Angle of equilibrium

Angle of repose

*All the given
answers*

Question Number : 5 Question Id : 5799651382 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If the number of members (m) are more than that required by the equation
 $m = 2j - 3$ (j is number of joints) such frames are called

Options :

Redundant frame

Weak frame

Perfect frame

Ideal frame

Question Number : 6 Question Id : 5799651383 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A compound bar having two members X and Y of length L when subjected to tensile force P would have elongation equal to (in usual notations)

Options :

$$\frac{PL}{A_X E_X + A_Y E_Y}$$

$$\frac{PL}{A_X E_X} + \frac{PL}{A_Y E_Y}$$

$$\frac{PL}{A_X E_X - A_Y E_Y}$$

$$\frac{PL}{A_X E_X} - \frac{PL}{A_Y E_Y}$$

Question Number : 7 Question Id : 5799651384 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A vertical prismatic bar fixed at the top end and loaded with **P** at the bottom free end, is having a unit weight of **w** and its length is **L**. If σ is the working stress, the safe cross sectional area for the bar when **P** and self weight are considered is given by

Options :

$$\frac{P}{\sigma + wL}$$

$$\frac{P}{\sigma - wL}$$

$$\frac{\sigma + wL}{P}$$

$$\frac{\sigma - wL}{P}$$

Question Number : 8 Question Id : 5799651385 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If temperature changes from t_0 to t in a simple bar with both ends constrained and having modulus of elasticity **E** and thermal coefficient α , the thermal stress due to the temperature rise is

Options :

$$E \frac{(t - t_0)}{\alpha}$$

$$\alpha \frac{(t - t_0)}{E}$$

$$E\alpha(t - t_0)$$

$$\frac{E\alpha}{(t - t_0)}$$

Question Number : 9 Question Id : 5799651386 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A circular solid uniform metal of cross section area A and length L is hanging vertically from its upper end. If the bar is having weight of W and modulus of rigidity E , the total elongation of the bar due to its own weight will be

Options :

$$\frac{2WL}{AE}$$

$$\frac{WL}{AE}$$

$$\frac{WL}{2 AE}$$

$$\frac{WL}{3 AE}$$

Question Number : 10 Question Id : 5799651387 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Volumetric strain of a sphere of diameter increasing from d_1 to d_2 is equal to

Options :

$$\frac{d_2 - d_1}{d_1}$$

$$3 \frac{(d_2 - d_1)}{d_1}$$

$$3 \frac{d_2 + d_1}{2 d_1}$$

$$\frac{d_2 + d_1}{2 d_1}$$

Question Number : 11 Question Id : 5799651388 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a circular rod having Poisson's ratio μ is subjected to an axial pull and if the strain is e , then the lateral strain is equal to

Options :

$$-\mu e$$

$$\mu e$$

$$-e/\mu$$

e/μ

Question Number : 12 Question Id : 5799651389 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The maximum tangential stress acting on a plane inclined to the direction of the axial stress (p) in a tensile bar is equal to

Options :

p

$2p$

$p/2$

$3p/2$

Question Number : 13 Question Id : 5799651390 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If an element in a body is in equilibrium under shearing stresses only, such a state of stress is called

Options :

Pure rotation

Pure shear

Pure bending

*None of the given
answers*

Question Number : 14 Question Id : 5799651391 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A steel bar is heated from 20°C to 35°C and it is free to expand. Then bar will have

Options :

No stress

Tensile stress

Compressive stress

Shear stress

Question Number : 15 Question Id : 5799651392 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

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Correct : 1 Wrong : 0

If a solid steel sphere of $10,000 \text{ cm}^3$ subjected to a uniform hydrostatic pressure of $700 \times 10^4 \text{ kg(f)/sq.m}$, then decrease in volume of the sphere for $1/K = 6 \times 10^{-11} \text{ (kg(f)/sq.m)}^{-1}$

Options :

2.4 cm^3

8.4 cm^3

4.2 cm^3

1.2 cm^3

Question Number : 16 Question Id : 5799651393 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Shear force at a section of a horizontal beam is the

Options :

algebraic sum of the vertical forces to any one side of the section

algebraic sum of the vertical forces on both sides of the section

algebraic sum of the moments of all forces on any one side of the section

algebraic sum of the moments of all forces on both sides of the section

Question Number : 17 Question Id : 5799651394 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

For UDL (uniformly distributed load) on a beam, the bending moment diagram (BMD) shows

Options :

Linear variation

Parabolic (curve) variation

*Rectangle or constant
value*

*Trapezoidal
variation*

Question Number : 18 Question Id : 5799651395 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Bending moment is maximum at a section of a beam where

Options :

*Shear force changes
from -ve to +ve*

Shear force is zero

*Shear force changes
from +ve to -ve*

*All the given
answers*

Question Number : 19 Question Id : 5799651396 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Which of the following is giving correct relation between load (w), shear force (F) and bending moment (M)

Options :

$$M = \frac{dF}{dx}$$

$$F = \frac{dM}{dx}$$

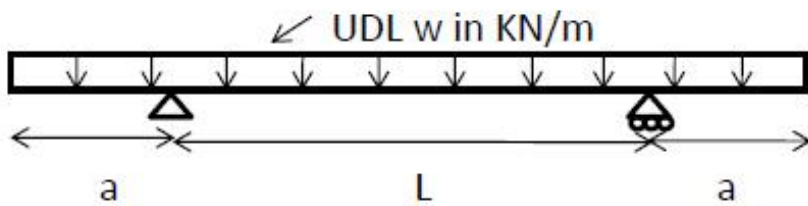
$$w = \frac{dM}{dx}$$

$$M = \frac{dw}{dx}$$

Question Number : 20 Question Id : 5799651397 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A beam with equal overhangs is carrying UDL as shown in the following figure. The bending moment at the centre of the beam will be zero for the condition



Options :

$a = L/3$

$a = L/2$

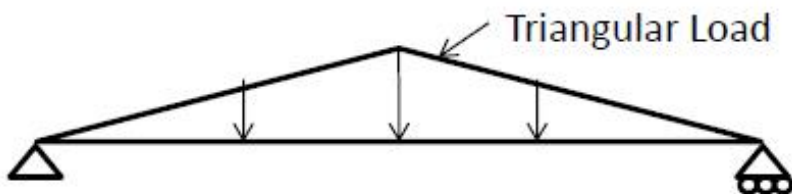
$a = 3L/2$

$a = L$

Question Number : 21 Question Id : 5799651398 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A simply supported beam is carrying a linearly varying load from zero at either ends to the maximum value at the mid span. Then the shape of shear force diagram (SFD) is



Options :

Rectangle

Triangular

Second Degree

Parabola

cubic

Question Number : 22 Question Id : 5799651399 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A simply supported beam of span L and constant width b carries a point load W at mid span. The depth of the beam required at the mid span for maximum extreme fibre stress p

Options :

$$d = \frac{3WL}{2bp}$$

$$d = \sqrt{\frac{3WL}{2bp}}$$

$$d^3 = \frac{3WL}{2bp}$$

$$d = \frac{3WL}{2bp^2}$$

Question Number : 23 Question Id : 5799651400 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a timber beam 8 cm wide and 16 cm deep is to be converted into an equivalent steel section of the same depth for analysis purpose, then the width of the equivalent section for a modular ratio of 20 will be

Options :

160 cm

2.5 cm

0.4 cm

12 cm

Question Number : 24 Question Id : 5799651401 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If the average shear stress in a rectangular section beam is 5 N/sq.mm, then maximum shear stress for the circular section of the equal area is

Options :

7.50 N/sq.mm

6.65 N/sq.mm

10 N/sq.mm

2.50 N/sq.mm

Question Number : 25 Question Id : 5799651402 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A cantilever beam of length L is subjected to a point load W at free end.
Then the slope at the free end is equal to

Options :

$$\frac{WL^3}{3EI}$$

$$\frac{WL^2}{24EI}$$

$$\frac{WL^3}{60EI}$$

$$\frac{WL^2}{2EI}$$

Question Number : 26 Question Id : 5799651403 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Flexural rigidity in usual notations is

Options :

$$\frac{M}{EI}$$

$$\frac{EI}{R}$$

$$EI$$

$$MR$$

Question Number : 27 Question Id : 5799651404 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The shape of the shear stress distribution diagram for a rectangular beam is

Options :

Parabola

Rectangle

Hyperbola

Triangular

Question Number : 28 Question Id : 5799651405 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

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The ability of material to absorb energy when it is deformed elastically and release energy upon unloading is called

Options :

Ductility

Hardness

Resilience

Toughness

Question Number : 29 Question Id : 5799651406 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The strain energy stored in a solid circular shaft, under pure torque, per unit its volume (take max. shear stress = q and modulus of rigidity = C) is expressed as

Options :

q^2 / C

$q / (4C)$

$q^3 / (4C)$

$q^2 / (4C)$

Question Number : 30 Question Id : 5799651407 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The principle of super position is valid only for

Options :

Any elastic materials

All metals

Linear elastic materials

Homogeneous materials

Question Number : 31 Question Id : 5799651408 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The value of Poisson's ratio for which bulk modulus of a material will be equal to its Young's modulus

Options :

0.33

0.15

0.45

0.25

Question Number : 32 Question Id : 5799651409 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

For Euler formula to be valid for mild steel struts which has yield stress of 3200 kg(f)/ sq.cm, the slenderness ratio should not be less than

Options :

80.48

40.28

160.96

53.65

Question Number : 33 Question Id : 5799651410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Rankin's formula proposed for crippling load (P_r) to cover all cases from short to very long column in terms of ultimate load for short column (P_s) and Euler's crippling load for long column (P_c) is

Options :

$$P_r = P_s + P_c$$

$$P_r = \frac{P_s + P_c}{2}$$

$$\frac{1}{P_r} = \frac{1}{P_s} + \frac{1}{P_c}$$

$$P_r = \frac{P_s - P_c}{P_s P_c}$$

Question Number : 34 Question Id : 5799651411 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The torque that produces a twist of one radian in a shaft per unit length is called

Options :

Modulus of elasticity

Bulk modulus

Torsion

Torsional rigidity

Question Number : 35 Question Id : 5799651412 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Power transmitted by a shaft(kW) subjected to an average torque T (kNm),
rotating at N rpm is equal to

Options :

$$\frac{2 \pi NT}{3600}$$

$$\frac{2 \pi NT}{4500}$$

$$\frac{2 \pi NT}{60}$$

$$\frac{\pi NT}{3060}$$

Question Number : 36 Question Id : 5799651413 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A brass tube has enclosed a steel bar and they have equal cross-sectional
area. The Young's modulus of elasticity is 200 GPa and 100 GPa for steel
and brass respectively. Then the ratio of stress developed in the steel bar to
that in the brass tube under compression is

Options :

0.5

1

1.5

2

Question Number : 37 Question Id : 5799651414 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Condition for no tension in a solid column of dia D the eccentricity e must be
less than or equal to

Options :

$$D/8$$

$$D/6$$

$$D/4$$

$$D/2$$

Question Number : 38 Question Id : 5799651415 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A horizontal beam of square section is placed with one diagonal (d) placed horizontally. The average shear stress occurs at

Options :

d/8 from neutral axis

d/4 from neutral axis

neutral axis

3d/8 from neutral axis

Question Number : 39 Question Id : 5799651416 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The mathematical expression for moment area theorem I for angle θ_{KL} between tangents drawn at K and L to elastic curve is

Options :

$$\theta_{KL} = \int_K^L \frac{MI}{E} dx$$

$$\theta_{KL} = \int_K^L \frac{M}{EI} dx$$

$$\theta_{KL} = \frac{M}{EI}$$

$$\theta_{KL} = \frac{E}{MI}$$

Question Number : 40 Question Id : 5799651417 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A simply supported beam AB of L span and EI flexural rigidity is subjected to M_B moment at B. Then the rotation at A is given by

Options :

$$\theta_A = \frac{ML}{6EI}$$

$$\theta_A = \frac{ML}{4EI}$$

$$\theta_A = \frac{ML}{3EI}$$

$$\theta_A = \frac{ML}{3EI}$$

Question Number : 41 Question Id : 5799651418 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In a thick cylinder subjected to internal pressure, the hoop stress is _____ at the outer surface and is _____ at the inner surface

Options :

min,min

max,max

max,min

min,max

Question Number : 42 Question Id : 5799651419 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

An element is subjected to $p_x=35$ Mpa(tensile) and $p_y = 20$ MPa (tensile)and shear stress $q = 7.5$ MPa. Then the direction of principal stresses is

Options :

45°

22.5°

30°

15°

Question Number : 43 Question Id : 5799651420 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Shearing stresses on principal planes will be

Options :

Equal to normal stresses

Half the normal stresses

Greater than normal stresses

zero

Question Number : 44 Question Id : 5799651421 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If normal stresses of same nature p_x and p_y and shear stress q are acting on two perpendicular planes and $q = (p_x p_y)^{1/2}$, then the major and minor principal stresses respectively are

Options :

$p_x + p_y$ and $p_x - p_y$

p_x and $p_x - p_y$

$0.5(p_x + p_y)$ and
 $0.5(p_x - p_y)$

$p_x + p_y$ and zero

Question Number : 45 Question Id : 5799651422 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The maximum shearing stress produced by shrinkfit between two cylinders (mounted one inside the other) of $E = 2 \times 10^6 \text{ kg(f)/m}^2$ and shrinkage factor = 0.002, is equal to

Options :

2000 kg(f)/m^2

2500 kg(f)/m^2

4000 kg(f)/m^2

1000 kg(f)/m^2

Question Number : 46 Question Id : 5799651423 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Two bars of same area and length but of different materials are subjected to same tensile force. If the bars have their axial elongation in the ratio of 4:6, then the ratio of modulus of elasticity of the two materials would be

Options :

4 : 6

6 : 4

2 : $\sqrt{6}$

$\sqrt{6}$: 2

Question Number : 47 Question Id : 5799651424 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The bulk modulus of elasticity of a materials is twice its modulus of rigidity.
The poisson's ratio of the material is

Options :

1/7

2/7

3/7

4/7

Question Number : 48 Question Id : 5799651425 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The diameter of a tapering rod varies from 'D' to 'D/2' in length of 'L' m. If it is subjected to an axial tension of 'P' the change in length is

Options :

$4 PL / (\pi ED^2)$

$8 PL / (\pi ED^2)$

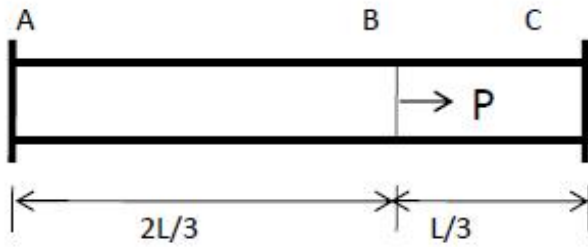
$2 PL / (\pi ED^2)$

None of the given answers

Question Number : 49 Question Id : 5799651426 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The ratio of loads shared by parts 'AB' and 'BC' of the bar shown below is



Options :

1 : 1

2 : 1

3 : 1

1 : 2

Question Number : 50 Question Id : 5799651427 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a steel tyre is heated and struck on a rigid wheel, after cooling the tyre will be subjected to

Options :

Bending

Torsion

Hoop stress

Compression

Question Number : 51 Question Id : 5799651428 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Let the strain produced in length and diameter of cylindrical rod be 0.02 and - .005 respectively. Then the volumetric strain is given by

Options :

0.03

0.025

0.015

0.01

Question Number : 52 Question Id : 5799651429 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A material with large deformation at failure is termed

Options :

Brittle

Elastic

Ductile

Elasto-plastic

Question Number : 53 Question Id : 5799651430 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Creep of a material is

Options :

*Continued deformation
with time under
sustained loading*

*Disappearance of
deformation on
removal of load*

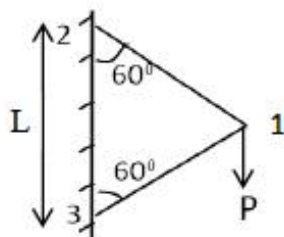
Not being ductile

To become brittle

Question Number : 54 Question Id : 5799651431 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A system of two prismatic bars of equal length (L) and equal cross-section (A) carries a vertical load P as shown in the figure given below. If their modulus of elasticity is E , the vertical displacement of the hinge 1 is



Options :

$$\frac{PL}{AE}$$

$$\frac{2 PL}{AE}$$

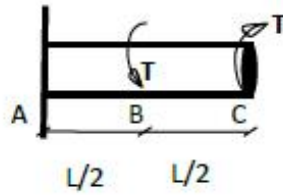
$$\frac{3PL}{AE}$$

$$\frac{2.5PL}{AE}$$

Question Number : 55 Question Id : 5799651432 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A shaft of J polar moment of Inertia and C modulus of rigidity is fixed at one end and subjected to torque T at the free end and the same torque at mid length in opposite direction as shown in figure, then the difference in the twist between the free end and the midpoint is equal to



Options :

$$\frac{T}{2CJ}$$

$$\frac{3T}{2CJ}$$

$$\frac{T}{CJ}$$

$$\frac{T}{4 CJ}$$

Question Number : 56 Question Id : 5799651433 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a shaft is simultaneously subjected to a torque T and bending moment M , the maximum shear stress is

Options :

$$\frac{16}{\pi D^3} (M + T)$$

$$\frac{16}{\pi D^3} (M + \sqrt{M^2 + T^2})$$

$$\frac{16}{\pi D^3} (M - \sqrt{M^2 + T^2})$$

$$\frac{16}{\pi D^3} \sqrt{M^2 + T^2}$$

Question Number : 57 Question Id : 5799651434 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The ratio of energy stored in a rectangular cantilever beam loaded at the free end without producing permanent set to the energy stored in the same bar in simple tension is

Options :

$1/2$

$1/3$

$1/6$

$1/9$

Question Number : 58 Question Id : 5799651435 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The theory which is in good agreement with experiments for ductile materials is

Options :

Maximum stress theory

Maximum strain theory

Maximum shear theory

All the given answers

Question Number : 59 Question Id : 5799651436 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The factor of safety in bending for rectangular beams in terms of yield point stress (σ_{yp}) and working stress (σ_w) is

Options :

$1.5 \frac{\sigma_{YP}}{\sigma_W}$

$$1.3 \quad \frac{\sigma_{YP}}{\sigma_W}$$

$$1.33 \quad \frac{\sigma_{YP}}{\sigma_W}$$

$$\frac{\sigma_{YP}}{\sigma_W}$$

Question Number : 60 Question Id : 5799651437 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The phenomenon of the decreased resistance of a material to repeated stresses is called

Options :

fatigue

creep

freezing

melting

Question Number : 61 Question Id : 5799651438 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A log of wood is of 3 m diameter circular section. Then the width of the strongest rectangular section is bending that can be cut out from this log of wood is

Options :

$\sqrt{6} \text{ m}$

$\sqrt{3} \text{ m}$

$1/\sqrt{3} \text{ m}$

$\sqrt{2}/3 \text{ m}$

Question Number : 62 Question Id : 5799651439 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A column that fails essentially by direct crushing at ultimate load is called

Options :

Euler's column

long column

short column

*None of the given
answers*

Question Number : 63 Question Id : 5799651440 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If the hoop stress in a thin cylinder is 24 N/sq.mm , then its longitudinal stress is equal to

Options :

36 N/sq.mm

24 N/sq.mm

12 N/sq.mm

6 N/sq.mm

Question Number : 64 Question Id : 5799651441 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The Rankine's constant for a cast iron column with both ends hinged

Options :

1/7500

1/1600

1/9000

0.00016

Question Number : 65 Question Id : 5799651442 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A compression member effectively held in position and restrained in direction at one end but not held in position or restrained in direction at the other end. If its actual length is L , then its effective length is equal to

Options :

0.67L

L

1.5L

2L

Question Number : 66 Question Id : 5799651443 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

<https://www.freshersnow.com/previous-year-question-papers/>

The width b and depth d of a cantilever beam carrying a point load at its free end are changed into $0.5b$ and $2d$ respectively. Then its maximum deflection for the same load condition reduces by

Options :

one-fourth

half

three-fourth

zero

Question Number : 67 Question Id : 5799651444 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A prismatic bar 1 m long and 4 sq.cm in cross sectional area is compressed by a force of 80 kN. If $E = 200$ kN/sq.mm, the total strain energy stored in the bar is equal to

Options :

40 kN-mm

0.05 kN-mm

400 kN-mm

80 kN-mm

Question Number : 68 Question Id : 5799651445 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A cantilever beam of length L is subjected to a point load P at free end. Then strain energy in usual notations is expressed as

Options :

$PL^3/(3EI)$

$PL/(6EI)$

$PL^2/(36EI)$

$P^2 L^3/(6EI)$

Question Number : 69 Question Id : 5799651446 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The number of contra flexure points that occur in a cantilever beam subjected uniformly distributed load is

Options :

3

2

1

0

Question Number : 70 Question Id : 5799651447 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Maximum value of shear stress in thin cylinders is equal to

Options :

hoop stress

2(hoop stress)

0.5(hoop stress)

0.25(hoop stress)

Question Number : 71 Question Id : 5799651448 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Euler's buckling load for both ends fixed condition is equal to (in usual notations)

Options :

$\pi^2 EI/l^2$

$4\pi^2 EI/l^2$

$2\pi^2 EI/l^4$

$0.25\pi^2 EI/l^5$

Question Number : 72 Question Id : 5799651449 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A simply supported beam of span L carries a point load P at center, the slope at left end is

Options :

$PL^3/(16EI)$

$PL^2/(48EI)$

$PL^2/(16EI)$

$PL^3/(48EI)$

Question Number : 73 Question Id : 5799651450 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The elastic curve of a beam means

Options :

BMD

SFD

Deflection curve

Stress-strain curve

Question Number : 74 Question Id : 5799651451 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Plastic response of a material to compressive force is known as

Options :

Elasticity

Ductility

Plasticity

Malleability

Question Number : 75 Question Id : 5799651452 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

When equations of statics are not sufficient to determine all the reactive forces at the supports, such beams are called

Options :

statically indeterminate

statically determinate

Imperfect

Defective

Question Number : 76 Question Id : 5799651453 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In Newtonian fluids, for a given shear stress, the rate at which the fluid deforms is

Options :

*Inversely
proportional to the
dynamic viscosity*

*Directly proportional
to the dynamic
viscosity*

*Independent of
kinematic viscosity*

*None of the given
answers*

Question Number : 77 Question Id : 5799651454 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The pressure difference between inside and outside of a soap bubble
of diameter d in terms of surface tension σ is

Options :

$2\sigma/d$

$8\sigma/d$

$4\sigma/d$

σ/d

Question Number : 78 Question Id : 5799651455 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Two horizontal plates are placed 14 mm apart and the space
between them is filled with an oil of viscosity of 14 poise. If the
upper plate moves with 2.5 m/s velocity, the shear stress in the oil is

Options :

2500 N/sq.m

250 N/sq.m

25 N/sq.m

2.5 N/sq.m

Question Number : 79 Question Id : 5799651456 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

With reference to the containers of different shapes having the same base area and filled with the same liquid for equal depths, the apparent contradiction in the hydrostatic force on the base of a liquid container and the weight of liquid in the container is known as

Options :

D' Alembert's paradox

Hydrodynamic paradox

Elevator Paradox

Hydrostatic paradox

Question Number : 80 Question Id : 5799651457 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The existence of velocity potential in fluid-flow indicates that

Options :

The flow must be irrotational

The flow is rotational and satisfies the continuity equation

The vorticity must not be zero

The circulation around any closed curve must have a finite value

Question Number : 81 Question Id : 5799651458 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The scale ratio in model of spillway is 1:9. If the discharge in the prototype is 2430 cumecs, the discharge in the model is (in cumecs)

Options :

270

90

30

10

Question Number : 82 Question Id : 5799651459 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Hydraulic jump is expected when slope of a channel changes from

Options :

steep to steeper

steep to mild

mild to critical

mild to steep

Question Number : 83 Question Id : 5799651460 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If Thoma's cavitation factor is less than the critical cavitation factor, then the overall efficiency of a reaction turbine will have

Options :

abnormal increase

no change

sharp fall

gradual increase

Question Number : 84 Question Id : 5799651461 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The angle of contact between pure water and clean glass is

Options :

0°

45°

90°

130°

Question Number : 85 Question Id : 5799651462 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Parshall flume is used to measure discharge in

Options :

pipes

wells

canals

spillways

Question Number : 86 Question Id : 5799651463 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Fluid flow analysis is valid as long as the smallest length dimension of the problem is much larger than the distance between molecules. This concept is known as

Options :

Control volume

Ideal fluid

Fluid continuum

Homogeneous fluid

Question Number : 87 Question Id : 5799651464 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A body weighing 40 N is losing 5 N weight when submerged in water. Then its specific gravity of the body is equal to
For a closed single pair of lock gates having 120° between them

Options :

8

6

4

2

Question Number : 88 Question Id : 5799651465 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

For a closed single pair of lock gates having 120° between them when symmetrically placed, the resultant pressure force (P) acting on a gate and the reaction force (F) between the butting edges of the two gates are related as

Options :

$F=P/2$

$F=2P$

$F=\sqrt{3}P/2$

$F=P$

Question Number : 89 Question Id : 5799651466 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A liquid jet of 30 m/s velocity is striking a single symmetrical moving curved vane at the centre. For maximum efficiency, the velocity of the vane should be

Options :

30 m/s

20 m/s

15m/s

10 m/s

Question Number : 90 Question Id : 5799651467 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If the velocity distribution over parallel planes is identical in a flow region, then the flow is treated as

Options :

one dimensional

two dimensional

three dimensional

Axi-Symmetric

Question Number : 91 Question Id : 5799651468 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A merchant ship has metacentric height of 2.7m. After unloading it increased to 3.6 m. The ratio of periodic times before and after unloading the cargo ship if radius of gyration is not altered is

Options :

1

0.75

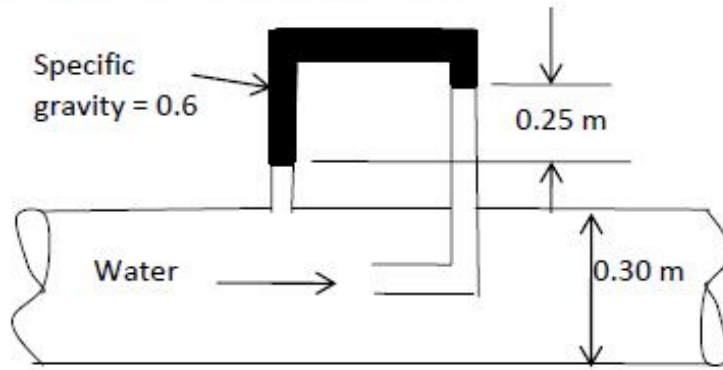
$\sqrt{3/4}$

$\sqrt{4/3}$

Question Number : 92 Question Id : 5799651469 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The velocity of head of water flowing through the pipe of 0.3 m dia for the conditions shown in the figure below is



Options :

0.25 m

0.15 m

0.44 m

0.1 m

Question Number : 93 Question Id : 5799651470 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Performance characteristic curves indicate that unit discharge is independent of unit speed for

Options :

Pelton wheel

Low specific speed

Francis turbine

High specific

speed Francis

turbine

Kaplan turbine

Question Number : 94 Question Id : 5799651471 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Hot wire anemometer is used for measuring

Options :

velocity of gases

velocity of liquids

pressure of gases

temperature of fluids

Question Number : 95 Question Id : 5799651472 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A pipe boundary will behave as hydrodynamically smooth if the relative magnitude of average height of the surface protrusions and the thickness of the laminar sublayer is

Options :

≤ 0.25

< 6

≥ 6

> 11.6

Question Number : 96 Question Id : 5799651473 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a sphere of 10 mm dia is falling in a fluid medium of kinematic viscosity of 10 stokes with terminal velocity of 12 mm/s, then coefficient of drag on the sphere will be

Options :

12

24

100

200

Question Number : 97 Question Id : 5799651474 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The boundary-layer separation occurs when

Options :

*the pressure gradient
is zero*

*the pressure gradient
is negative*

*the pressure
gradient is
adverse*

velocity increases

Question Number : 98 Question Id : 5799651475 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Compressibility of fluid is insignificant if Mach number is

Options :

greater than 1

equal to 1

between 0.4 -1

less than 0.4

Question Number : 99 Question Id : 5799651476 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The pressure drop in a laminar flow through circular pipe is dependent on

Options :

velocity of flow

viscosity of the fluid

*diameter of the
pipe*

*All the given
answers*

Question Number : 100 Question Id : 5799651477 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The deformation drag experienced by a sphere of d dia, moving at V velocity through a fluid of μ dynamic viscosity is given by

Options :

$3\pi Vd/\mu$

$3\pi \mu Vd$

$3\pi \mu Vd^2$

$3\pi \mu V^2 d$

Question Number : 101 Question Id : 5799651478 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Intensity of turbulence is

Options :

*the root mean
square value of
velocity fluctuations*

The average kinetic energy of turbulence

The mean time interval between the reversals in the sign of velocity fluctuation

the square root of Reynolds number

Question Number : 102 Question Id : 5799651479 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The average coefficient of friction drag for turbulent boundary layer is expressed by

Options :

$0.664/\sqrt{Re}$

$0.664/(Re)^{1/5}$

$0.074/(Re)^{1/4}$

$0.074/\sqrt{Re}$

Question Number : 103 Question Id : 5799651480 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The drag coefficient at supersonic velocities depends on

Options :

Reynolds number only

Mach number only

Weber number only

Euler number only

Question Number : 104 Question Id : 5799651481 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The entrance length or length of establishment of turbulent flow in pipes is

Options :

*Inversly proportional
to pipe dia*

*proportional to
Reynolds number (Re)*

*proportional to
 $Re^{0.25}$*

proportional to $Re^{0.6}$

Question Number : 105 Question Id : 5799651482 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In a rectangular channel of 1 m width the critical depth for a flow of 3.132 cumecs is approximately equal to

Options :

2 m

1 m

0.1 m

3.14 m

Question Number : 106 Question Id : 5799651483 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The control which will limit pump outlet pressure to a predetermined level and adjust pump outlet flow to the level needed to maintain the set pressure, is

Options :

*pressure
compensator control*

Load sense control

Meter-In circuit

Meter-Out circuit

Question Number : 107 Question Id : 5799651484 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

An unsymmetrical sprinkler has frictionless and equal flow through each of the two nozzles. If the absolute velocities are 6.0 and 9.0 m/s, the ratio of the distances of the nozzles from the rotating shaft

Options :

9 : 6

$$9^{1/2} : 6^{1/2}$$

$$9^2 : 6^2$$

$$9^3 : 6^3$$

Question Number : 108 Question Id : 5799651485 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The pressure variation along the radial direction for vortex flow along a horizontal plane is given by

Options :

$$\partial p / \partial r = \rho v^2 / r$$

$$\partial p / \partial r = \rho v / r$$

$$\partial p / \partial r = \rho v^2 / r^2$$

$$\partial p / \partial r = \rho v^3 / r^2$$

Question Number : 109 Question Id : 5799651486 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The speed of a geometrically similar turbine such that when it is developing 1 kW the total suction head is equal to 1 meter. The speed is known as

Options :

specific speed

unit speed

suction specific speed

critical speed

Question Number : 110 Question Id : 5799651487 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Relation between shear and pressure gradients in a two dimensional laminar flow under steady and uniform conditions

Options :

$$\partial \tau / \partial x = \partial p / \partial x$$

$$\partial \tau / \partial y = \partial p / \partial x$$

$$\frac{\partial^2 \tau}{\partial x^2} = \frac{\partial^2 p}{\partial x^2}$$

$$\frac{\partial^2 \tau}{\partial x^2} = \frac{\partial^2 p}{\partial y^2}$$

Question Number : 111 Question Id : 5799651488 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A fluid jet of cross sectional area of a and velocity of V strikes (normal to) moving plate arranged in series with velocity u and $u < V$, the actual fluid mass striking is equal to

Options :

$$\rho a(V-u)$$

$$\rho a u$$

$$\rho a V$$

$$\rho a(V+u)$$

Question Number : 112 Question Id : 5799651489 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In order to have a continuous flow through a siphon, no portion of the pipe should be higher than _____ above HGL.

Options :

$$2.55 \text{ m}$$

$$0.775 \text{ m}$$

$$7.75 \text{ m}$$

$$25.5 \text{ m}$$

Question Number : 113 Question Id : 5799651490 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The loss of energy in Orifice meter is more than in the case of Venturimeter because

Options :

Sudden obstruction

Turbulence

More friction

pressure variation

Question Number : 114 Question Id : 5799651491 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

For a body completely submerged in a fluid, the centre of gravity (G) and centre of buoyancy (O) are known. The body is said to be in stable equilibrium, if

Options :

O does not coincides with centre of mass of the displaced fluid

G coincides with centre of mass of the displaced fluid

O lies above G

O lies below G

Question Number : 115 Question Id : 5799651492 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

At two points 1 and 2 in a pipeline, the velocities are V and $2V$ respectively. Both the points are at the same elevation. The fluid density as ρ . The difference between pressure at 1 and 2 is

Options :

$\frac{1}{2} \rho V^2$

$\frac{3}{2} \rho V^2$

$2 \rho V^2$

$3 \rho V^2$

Question Number : 116 Question Id : 5799651493 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The velocity field for a flow is given by $v = (5x + 6y + 7z)i + (6x + 5y + 9z)j + (3x + 2y + \lambda z)k$ and density varies as $\rho = \rho_0 e^{-2t}$. In order that the mass is conserved, the value of λ should be

Options :

-12

-10

-8

10

Question Number : 117 Question Id : 5799651494 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A 10cm side cube weighing 5N is immersed in a liquid of relative density 0.8 contained in a rectangular tank of cross-sectional area $15\text{cm} \times 15\text{cm}$. If the tank contained liquid to a height of 8cm before the immersion. The buoyant force on the cube is

Options :

10N

5000N

5N

zero

Question Number : 118 Question Id : 5799651495 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

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

List I description	List II property of fluid
P. Property which explains the spherical shape of the drop of a liquid	1. Viscosity
Q. Property which explains cavitation in fluid flow	2. Surface Tension
R. Property which explains rise of sap in free	3. Compressibility
S. Property which explains flow of oil jet	4. Vapour pressure
	5. Capillarity

Options :

P Q R S
1 2 4 5

P Q R S
2 4 5 1

P Q R S
3 4 5 1

P Q R S
1 2 3 4

Question Number : 119 Question Id : 5799651496 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Uniform flow occurs

Options :

when the spatial rate of the change of velocity is zero

when the temporal rate of the change of velocity is zero

when the velocity changes steadily along the direction of the flow

only when velocity vector at any point remains constant.

Question Number : 120 Question Id : 5799651497 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The x-component of velocity in a 2D incompressible flow is given by $u = 1.5x$. At the point $(x,y) = (1,0)$, the y-component of velocity $v=0$. The equation for the y-component of the velocity is

Options :

$v = 0$

$v = 1.5y$

$v = -1.5y$

$v = -1.5x$

Question Number : 121 Question Id : 5799651498 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

For a 2D irrotational flow, the velocity potential is defined as $\phi = \log_e(x^2 + y^2)$. Which of the following is possible stream function ψ , for this flow?

Options :

$\frac{1}{2} \tan^{-1}\left(\frac{y}{x}\right)$

$\tan^{-1}\left(\frac{y}{x}\right)$

$2 \tan^{-1}\left(\frac{y}{x}\right)$

$2 \tan^{-1}\left(\frac{x}{y}\right)$

Question Number : 122 Question Id : 5799651499 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A pitot static tube having coefficient of velocity 0.98, measures velocities of water in a pipe. The stagnation pressure recorded is 3m and static pressure 2m. The actual velocity in pipe is

Options :

4.429m/s

4.341m/s

4.431m/s

zero

Question Number : 123 Question Id : 5799651500 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The velocity in m/s at a point in a 2D flow is given as $v = 2yi+3xj$. The equation of stream line passing through the point is

Options :

$3dx-2dy = 0$

$2x+3y = 0$

$3dx+2dy = 0$

$$xy = 6$$

Question Number : 124 Question Id : 5799651501 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Select the correct statement

Options :

Absolute pressure = Gage pressure - Atmospheric pressure

Gage pressure = Absolute pressure - Atmospheric pressure

Absolute pressure = Atmospheric pressure + vacuum pressure

Gage pressure = Atmospheric pressure + vacuum pressure

Question Number : 125 Question Id : 5799651502 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

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

Options :

20

30

15

10

Question Number : 126 Question Id : 5799651503 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

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

List I

List II

P. Moment of momentum equation

1. Equation to find energy loss in pipeline having laminar flow.

Q. Bernoulli's equation

2. Equation of motion for 1-D steady flow

R. Euler's equation

3. Equation based on momentum conservation principle.

S. Hagen-poiseulle equation

4. 3-D equation of motion based on momentum conservation.

Options :

P Q R S

2 3 4 1

P Q R S

3 2 1 4

P Q R S

2 3 1 4

P Q R S
3 2 4 1

Question Number : 127 Question Id : 5799651504 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

When a pressure of $2 \times 10^4 \text{ kN/m}^2$ is applied to 50 litres of a liquid, its volume is decreased by 0.5 litre. The bulk modulus of liquid in N/m^2 is

Options :

20×10^9

2×10^9

4×10^9

40×10^9

Question Number : 128 Question Id : 5799651505 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A rectangular plate of 2m wide is submerged in water vertically such that its top and bottom surfaces are 2m and 5m respectively below the free surface. The total pressure on plate is

Options :

20601N

20601kN

206.01kN

206.01N

Question Number : 129 Question Id : 5799651506 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

An iceberg floats in sea water. If the specific gravity of iceberg and sea water are 0.9 and 1.03 respectively, The percentage of total volume of the iceberg below the sea water surface is

Options :

87.38%

8.738%

7.38%

78.38%

Question Number : 130 Question Id : 5799651507 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A control volume implies

Options :

an isolated system

a closed system

a specified mass in fluid flow

a fixed region in space

Question Number : 131 Question Id : 5799651508 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The reading of differential manometer of a venturimeter, placed at 45° to the horizontal is 11cm. If the venturimeter is turned to horizontal position, the manometer reading will be

Options :

zero

$$\frac{1}{\sqrt{2}} \text{ cm}$$

11cm

$$11\sqrt{2} \text{ cm}$$

Question Number : 132 Question Id : 5799651509 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If a tank discharges water from an orifice under variable head h , the water will be lowered at a constant velocity, if the surface area of the tank varies as

Options :

$$\sqrt{h}$$

$$\frac{1}{\sqrt{h}}$$

$$\frac{1}{h}$$

$$h$$

Question Number : 133 Question Id : 5799651510 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

An orifice discharges under a head of 1.25m of water. A pitot tube kept at its centre line at the vena contracta indicates a head of 1.20m of water. The coefficient of velocity of the orifice is

Options :

0.990

0.980

0.956

0.965

Question Number : 134 Question Id : 5799651511 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A solid is suspended by a thread and the body is submerged in a liquid. If V and γ_b all the volume and specific weight of the body are 1 m^3 and 25 kN and the specific weight of the liquid is 10 kN , the tension in the thread is

Options :

15 kN

10 kN

5 kN

25 kN

Question Number : 135 Question Id : 5799651512 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Which of the following is used for the measurement of rate of flow in open channel such as flow of water in river?

Options :

Notches

weir

orifices

Mouthpieces

Question Number : 136 Question Id : 5799651513 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A stagnation point is a point in the fluid flow where

Options :

total energy is zero

pressure is zero

velocity of flow is zero

total energy is maximum

Question Number : 137 Question Id : 5799651514 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Each term of Bernoulli's equation stated in the form $\frac{p}{\gamma} + \frac{v^2}{2g} + z = \text{constant}$, has units of

Options :

N

Nm/kg

Nm/s

Nm/N

Question Number : 138 Question Id : 5799651515 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The specific speed(N_s) of pump is given by the expression

Options :

$$N_s = \frac{N\sqrt{Q}}{H_m^{5/4}}$$

$$N_s = \frac{N\sqrt{P}}{H_m^{3/4}}$$

$$N_s = \frac{N\sqrt{Q}}{H_m^{3/4}}$$

$$N_s = \frac{N\sqrt{P}}{H_m^{5/4}}$$

Question Number : 139 Question Id : 5799651516 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Which of the following statement is correct?

Options :

- centrifugal pump convert mechanical energy into hydraulic energy by sucking liquid into chamber
- reciprocating pumps convert mechanical energy into hydraulic energy by means of centrifugal energy
- centrifugal pumps convert mechanical energy into hydraulic energy by means of centrifugal force
- reciprocating pumps convert hydraulic energy into mechanical energy.

Question Number : 140 Question Id : 5799651517 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The internal and external diameter of the impeller of a centrifugal pump are 200mm and 400mm respectively. The pump is running at 1200r.p.m. The vane angles of the impeller at inlet and outlet are 20° and 30° respectively. The water enters the impeller radially and velocity of flow is constant. The tangential velocity at the inlet and outlet in m/s is

Options :

- 125.6, 25.13
- 12.56, 25.13
- 12.56, 2.513
- 1.256, 25.13

Question Number : 141 Question Id : 5799651518 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm. Works against a total head of 40m. The velocity of flow through the impeller is constant and equal to 2.5m/s. The vanes are set back at an angle 40° at outlet. If the outer diameter of the impeller is 500mm and width at outlet is 50mm, the discharge is .

Options :

- $1.963 \text{ m}^3/\text{sec}$
- $0.1963 \text{ m}^3/\text{min}$
- $0.1963 \text{ m}^3/\text{sec}$
- $0.1963 \text{ cm}^3/\text{sec}$

Question Number : 142 Question Id : 5799651519 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

If two pumps, identical in all respects and each capable of delivering a discharge Q against a head H are connected in parallel, the resulting discharge is

Options :

- Q against a head 2H
- 2Q against a head H
- 2Q against a head 2H
- $2Q$ against a head $H^{1/2}$

Question Number : 143 Question Id : 5799651520 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

In laminar flow through a pipe discharge varies

Options :

linearly as the viscosity

as the square of radius

inversely as the pressure drop

inversely as the viscosity

Question Number : 144 Question Id : 5799651521 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A pipeline of diameter 10cm carries a discharge at a velocity of 1m/s. It branches into two pipes each of diameter 5cm. Consider the following statements

1. velocity in each branch is 2m/s
 2. discharges in the two branched pipes are equal
 3. rate of flow before and after branching is same
 4. velocity in 5cm pipe is half of that in 10cm pipe
- Select the correct answer using codes given below:

Options :

1 and 2

1 and 4

2,3 and 4

1,2 and 3

Question Number : 145 Question Id : 5799651522 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A penstock is 3000m long. Pressure wave travels in it with a velocity of 1500m/s. If the turbine gates are closed uniformly and completely in a period of 4.5seconds, then it is called

Options :

rapid closure

slow closure

sudden closure

uniform closure

Question Number : 146 Question Id : 5799651523 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A reaction turbine discharge $35\text{m}^3/\text{s}$ under a head of 9m and with an overall efficiency of 91%. The power developed in kW is

Options :

286.65

37.49

3.822

28.665

Question Number : 147 Question Id : 5799651524 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A draft tube is fitted to the exit of a reaction turbine, located at 1.82m above tail race level. The efficiency of draft tube is 75% and velocity of flow at the entry to draft tube is 10m/s. The pressure at the entrance section of draft tube is

Options :

- 5 m
- 3.82m
- 10.2m
- 1.82m

Question Number : 148 Question Id : 5799651525 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

A Pelton wheel has a mean bucket speed of 10m/s with a jet of water flowing at the rate of 700litre/sec under a head of 30m. The bucket deflects the jet through an angle of 160° . Theoretical velocity of jet is 24.26 m/s. Assuming the coefficient of velocity 0.98, the velocity of whirl at inlet in cm/sec is

Options :

- 2377
- 23.77
- 237.7
- 23770

Question Number : 149 Question Id : 5799651526 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

Two jets strikes the buckets of a Pelton wheel, which is having shaft power as 15450kW. The diameter of each jet is given as 200mm. If the net head on the turbine is 400m, the power at the inlet of turbine is (Take $C_v = 1.0$)

Options :

- 21817.44kW
- 2181.1744kW
- 21.81kW
- 21817.44W

Question Number : 150 Question Id : 5799651527 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes
Single Line Question Option : No Option Orientation : Vertical

Correct : 1 Wrong : 0

The hydraulic grade line is

Options :

- always above the energy grade line
- the velocity head below the energy grade line
- always above the closed conduit
- always sloping downward in the direction of flow