Q :) A pipe contains an oil of specific gravity 0.9. A differential manometer connected at the two points A and B shows a difference in mercury levels as 15 cm. The difference of pressure at the two points A and B will be (Note : consider the density of mercury as 13600 kg/m^3) [ISRO 2020]

A : 18688 N/m^2

B : 15981 N/m^2

C : 288 N/m^2

D : 6528 N/m^2

Q :) Shear reinforcement is required to prevent propagation of _____.
[UPPCL JE 2020]

A : Flexural cracks

B : Dowel crack

C : Splitting crack

D : Diagonal cracks

Q :) Rankine's Theory is also known as: [UPPCL JE 2020]

A : Maximum distortions energy theory

B : Maximum shear stress theory

C : Maximum Principal stress theory

D : Maximum strain energy theory

Q :) A point in a strained material is subjected to two mutually perpendicular stresses of 150 MPa (tensile) and 50 MPa (compressive), then what will be the magnitude of maximum shear stress in the component? [MPSC AE 2019]

A : 50 MPa

B : 100 MPa

C : 150 MPa

D : 200 MPa

Q :) Euler's formula for buckling of column does not hold good if slenderness ratio $\left(\frac{le}{K}\right)$ is _____ for mild steel column.

[MPSC AE 2019]

A : Less than 80

B : Greater than 90

C : 120 - 160

D : 90 – 120

Q :) Maximum deflection of a simply supported beam with the total uniformly distributed load ‘W’ is: [MPSC AE 2019]

A : $\frac{Wl^3}{384\,EI}$

B : $\frac{5}{384}\,\frac{Wl^3}{EI}$

C : $\frac{Wl^3}{48\,EI}$

D : $\frac{5}{48\,EI}\,\frac{Wl^3}{EI}$

Q :) If S_y = Specific yield and S_r = Specific retention, then

[MPSC JE 2019]

A : $S_y + S_r = 0.50$

B : $S_y + S_r$ = Porosity

C : $S_y + S_r = 1.0$

D : $S_y + S_r$ = Permeability

Q :) In case of gravity dams, the factor of safety against over turning should not less than [MPSC JE 2019]

A : 1.00

B : 1.10

C : 1.25

D : 1.50

Q :) In reinforced cement concrete construction, lap splices are not recommended to be used for rebars when the bar diameter is more than: [CIL 2016-17]

(a): 36 mm

(b): 25 mm

(c): 32 mm

(d): 30 mm

Q :) What shall be the minimum effective throat thickness of a fillet weld in case of structural steel design? [CIL 2016-17]

(a): 4 mm

(b): 3 mm

(c): 5 mm

(d): 2 mm

Q :) In a detailed estimation, what is the percentage of contingency to be considered to the total item works cost as per public works department? [DMRC JE 2020]

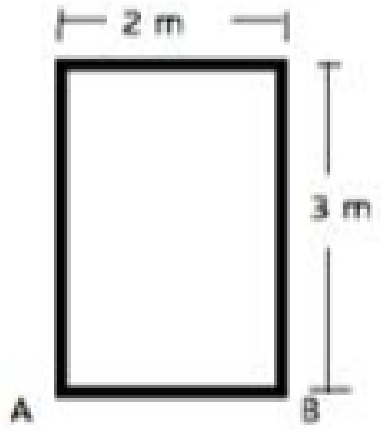
A : 10%

B : 15%

C : 5%

D : 2.5%

Q :) The moment of inertia of a rectangle (shown in the below figure) about the lower edge AB is: [DMRC JE 2020]



A : 6.0 m^4

B : 18.0 m^4

C : 1.5 m^4

D : 4.5 m^4

Q :) Bearings are provided in bridges to [GPSC AE 2020]

A : allow translation and rotation in bridges

B : resist translation and rotation in bridges

C : transfer forces from sub-structure to super-structures

D : allow displacement in vertical and horizontal directions

Q :) Which of following code is useful for bridge designing?

[GPSC AE 2020]

A : IRC-6

B : IS: 875, Part-I

C : IS: 3370

D : IRC-38

Q :) If the surface tension at air-water interface is 0.07N/m, then the pressure difference between the inside and outside of an air bubble of diameter 0.02 mm will be: [LMRC JE 2020]

A : 28 kPa

B : 0.09 kPa

C : 14 kPa

D : 35 kPa

Q :) The flow in a pipe is laminar if [LMRC JE 2020]

A : Reynolds number is more than 6000

B : Reynolds number is more between 2000 and 4000

C : Reynolds number is more than 4000

D : Reynolds number is less than 2000

Q :) Three pipes with diameter, length and friction factor values of (D_1, L_1, f_1), (D_2, L_2, f_2) and (D_3, L_3, f_3) are connected in parallel between two reservoirs A and B. If an equivalent pipe (D_e, L_e, f_e), is to replace all the pipes connected in parallel, the equation to get an equivalent pipe is:
[LMRC AE 2020]

A : $(D_e^5/ L_e f_e)^{0.5} = (D_1^5/ L_1 f_1)^{0.5}+(D_2^5/ L_2 f_2)^{0.5}+(D_3^5/ L_3 f_3)^{0.5}$

B : $(L_e f_e /D_e^5) = (L_1 f_1 /D_1^5)+ (L_2 f_2 /D_2^5)+ (L_3 f_3 /D_3^5)$

C : $(L_e f_e /D_e^5)^{0.5} = (L_1 f_1 /D_1^5)^{0.5}+(L_2 f_2 /D_2^5)^{0.5}+(L_3 f_3 /D_3^5)^{0.5}$

D : $(D_e^5/ L_e f_e)^2 = (D_1^5/ L_1 f_1)^2+(D_2^5/ L_2 f_2)^2+(D_3^5/ L_3 f_3)^2$

Q :) If a structure is subjected to moving loads, the variation in bending moment and shear is best described using _____. [LMRC AE 2020]

A : Shear force diagram

B : Influence load diagram

C : Influence line diagram

D : Bending moment diagram

Q :) The function of an air vessel in a reciprocating pump is to obtain [JPSE AE 2020]

A : reduction of suction head

B : rise in delivery head

C : continuous supply of water at uniform rate

D : increase in supply of water

Q :) The performance of a well is measured by its [JPSE AE 2020]

A : specific capacity

B : specific yield

C : storage co-efficient

D : permeability co-efficient