

Q : For the structure shown, the elements of the flexibility matrix are:

[APPSC 2016]

A : $f_{11} = \frac{l}{(EI)}$; $f_{21} = \frac{l^2}{(2EI)}$; $f_{12} = \frac{l^2}{(2EI)}$; $f_{22} = \frac{l^3}{(3EI)}$

B : $f_{11} = \frac{l^3}{(3EI)}$; $f_{21} = \frac{l^2}{(2EI)}$; $f_{12} = \frac{l^2}{(2EI)}$; $f_{22} = \frac{l}{(EI)}$

C : $f_{11} = \frac{l}{(EI)}$; $f_{21} = \frac{l^2}{(EI)}$; $f_{12} = \frac{l^2}{(EI)}$; $f_{22} = \frac{l^3}{(3EI)}$

D : $f_{11} = \frac{l}{(EI)}$; $f_{21} = \frac{l^2}{(2EI)}$; $f_{12} = \frac{l^2}{(2EI)}$; $f_{22} = \frac{l^3}{(4EI)}$

Q : Three turbines each of capacity 10000 kW are installed at a hydel power station. If the peak load and the average load produced during a certain period are 25000 kW and 15000 kW respectively, then load factor and plant factor are respectively equal to:

[APPSC 2016]

A : 60% and 50%

B : 50% and 60%

C : 40% and 50%

D : 50% and 40%

Q : In a grillage footing the beams in each tier are spaced such that the minimum spacing between the flanges of the two consecutive beams is not less than:

[RPSC 2013]

A : 50 mm

B : 75 mm

C : 100 mm

D : 150 mm

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Q : Dead weight of waist slab of a stair case spanning longitudinally is calculated as:

[MPSC 2015]

A : $25D\sqrt{1 + \left(\frac{R}{T}\right)^2}$

B : $25d\sqrt{1 + \left(\frac{R}{T}\right)^2}$

C : $25D\sqrt{1 + \left(\frac{T}{R}\right)^2}$

D : $25d\sqrt{1 + \left(\frac{T}{R}\right)^2}$

Q : The splice plate for the steel column is generally designed as [KPSC 2017]

A : Short column

B : Long column

C : Intermediate column

D : Based on slenderness ratio.

Q : For a hydraulically efficient rectangular channel of bed width 5m, the hydraulic radius is equal to

[KPSC 2017]

A : 1.25 m

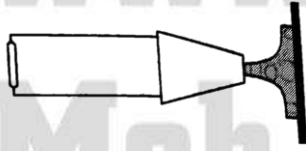
B : 2 m

C : 2.25 m

D : 1.75 m

Q : A 0.3 m diameter pipeline terminates in a nozzle of outlet diameter = 0.15 m. The free jet from the nozzle is deflected through 90° by a flat plate as shown. When water flows through this pipe at a rate of $0.25 \text{ m}^3/\text{second}$, the force required to hold the plate is most nearly.

[HPPSC 2016]



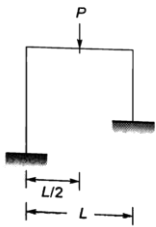
A : 880 N

B : 1760 N

C : 2640 N

D : 3530 N

Q : A rigid jointed plane frame as shown below will have:



[UKPSC 2013]

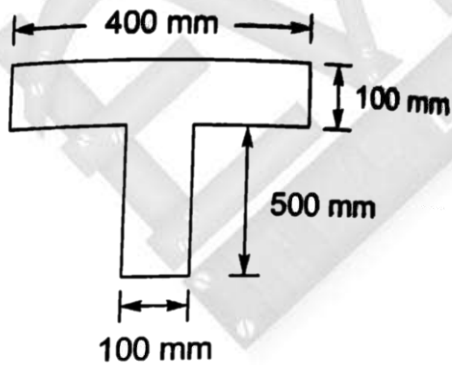
A : Sway to right

B : Sway to left

C : Not sway

D : None of above.

Q : In the 'T' section as shown in figure, distance of neutral axis from top is:



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[UKPSC 2013]

A : 100 mm

B : 300 mm

C : 200 mm

D : 216 mm

Q : The rainfall on five successive days were measured as 100 mm, 80 mm, 60 mm, 40 mm and 20 mm respectively. If the infiltration index or the storm loss rate for the catchment area is earlier estimated as 50 mm/day, the total surface run off will be:

[RPSC 2013]

A : 50 mm

B : 60 mm

C : 90 mm

D : 140 mm

Q : What is the range of the speed ratio for a Francis Turbine?

[MPSC 2017]

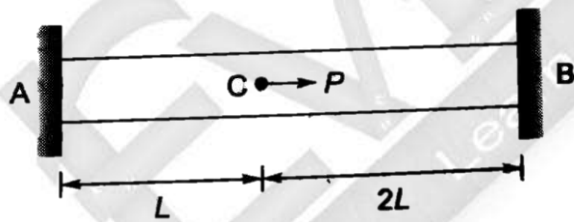
A : 0.10 to 0.30

B : 0.60 to 0.90

C : 0.85 to 0.00

D : 1.40 to 2.25

Q : A straight bar which is fixed at the ends A and B and having elastic modulus (E) and cross-sectional area(A), is subjected to a load $P = 120$ N at C as shown in figure. The reactions at the ends are



[HPPSC 2016]

A : 40 N at A, 80 N at B

B : 30 N at A, 90 N at B

C : 80 N at A, 40 N at B

D : 60 N at A, 60 N at B.

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