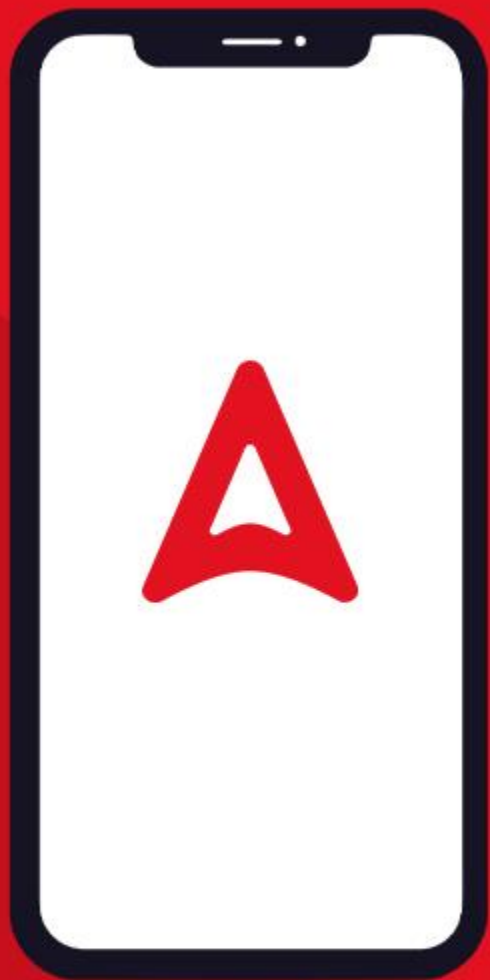


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Benchmark is established by?

- (a) Spirit Levelling
- (b) Trigonometric levelling
- (c) Barometric levelling
- (d) Hypsometry

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Radius of visible horizon from top of a 134 m light house will be:

- (a) 44.62 km
- (b) 54.5 km
- (c) 87.44 km
- (d) 89.67 km

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Which one of the following is not a self reading staff?

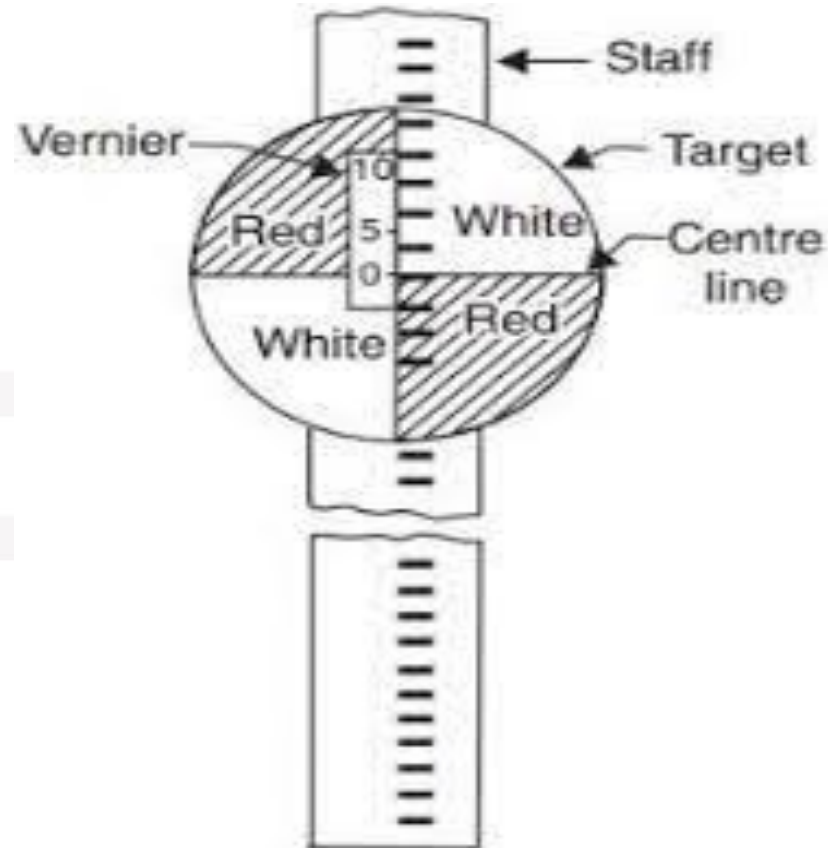
- (a) Solid staff
- (b) Folding staff
- (c) Telescopic staff
- (d) Target staff

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Which one of the following is not a self reading staff?

- (a) Solid staff
- (b) Folding staff
- (c) Telescopic staff
- (d) Target staff



(c) Target staff

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A vertical photograph was taken at an altitude of 1500 m above mean sea level. If the focal length of the camera is 20 m, the scale of photograph for a terrain lying at an elevating of 500 m is

- (a) 1: 50
- (b) 1: 100
- (c) 1: 1000
- (d) 1: 25

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The reference points on which a day's work is closed and from where levelling is continued the next day are called as:

- (a) Temporary benchmarks
- (b) Arbitrary benchmarks
- (c) Permanent benchmarks
- (d) GTS benchmarks

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Which minor instrument is used in surveying?

- (a) Auto level
- (b) Abney level
- (c) Dumpy level
- (d) Wye level



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A steel rod of 20 mm diameter is used as a tie member in the roof bracing system, and may be subjected to possible reversal of stress due to wind load. What is the maximum permissible length of the member?

- (a) 2000 mm
- (b) 2500 mm
- (c) 1750 mm
- (d) 3000 mm

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As per IS 800: 2007, what should be the maximum slenderness ratio for the tension members in which reversal stress due to load other than wind or seismic forces occurs?

- (a) 580
- (b) 180
- (c) 400
- (d) 350

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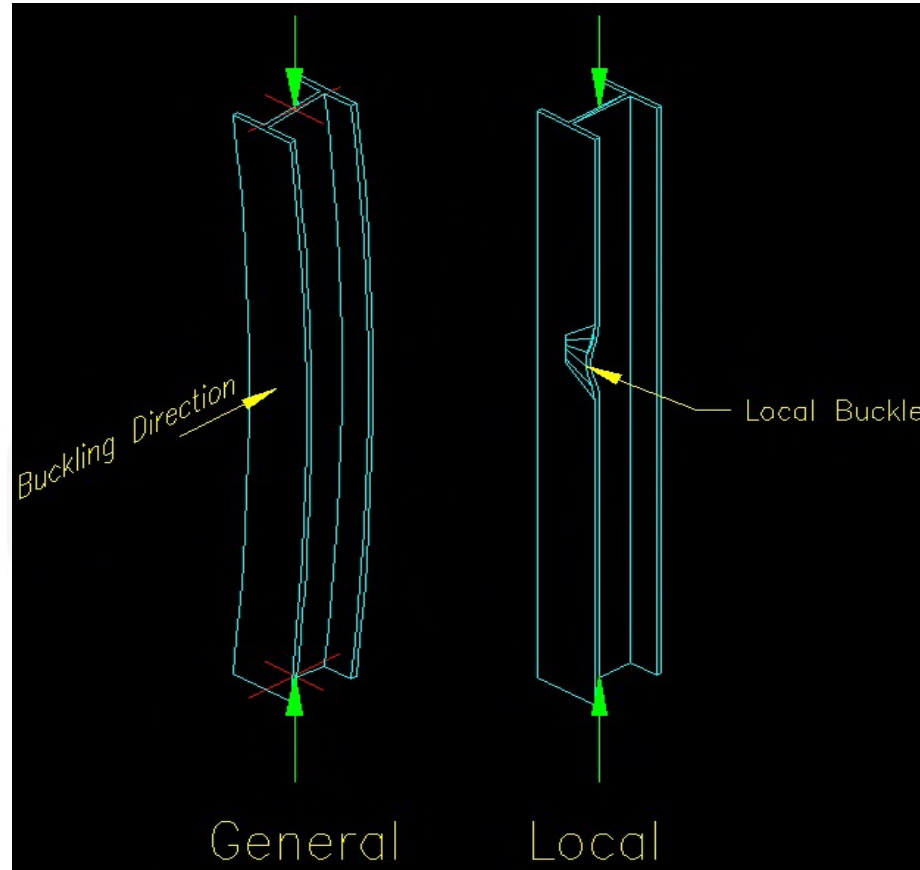
Which of the following is NOT a mod of failure in a tension member?

- (a) Gross section yielding
- (b) Block shear failure
- (c) Local buckling.
- (d) Net section repture

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Which of the following is NOT a mod of failure in a tension member?



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**Adda247**

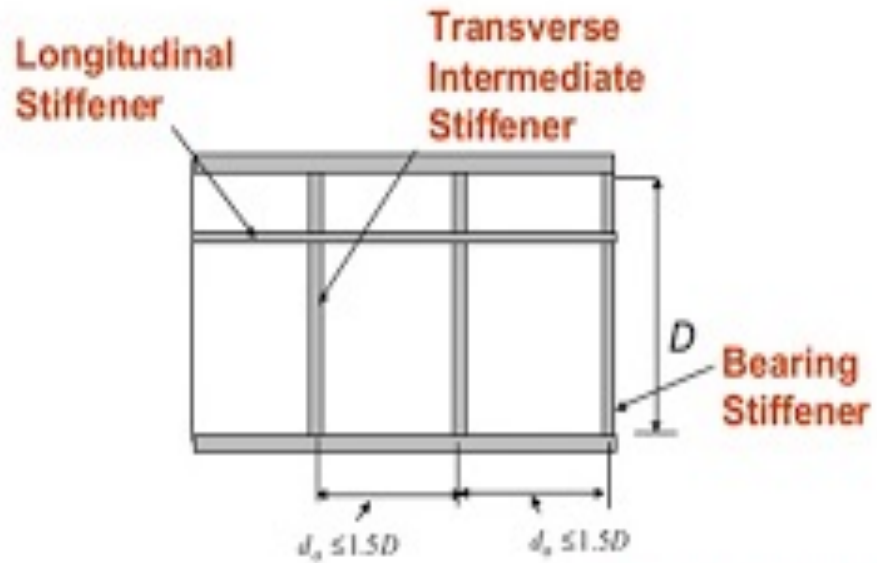
**Bearing stiffeners in plate girder are provided at:**

- (a) Mid span**
- (b) Equal interval**
- (c) Supports**
- (d) Netural axis**

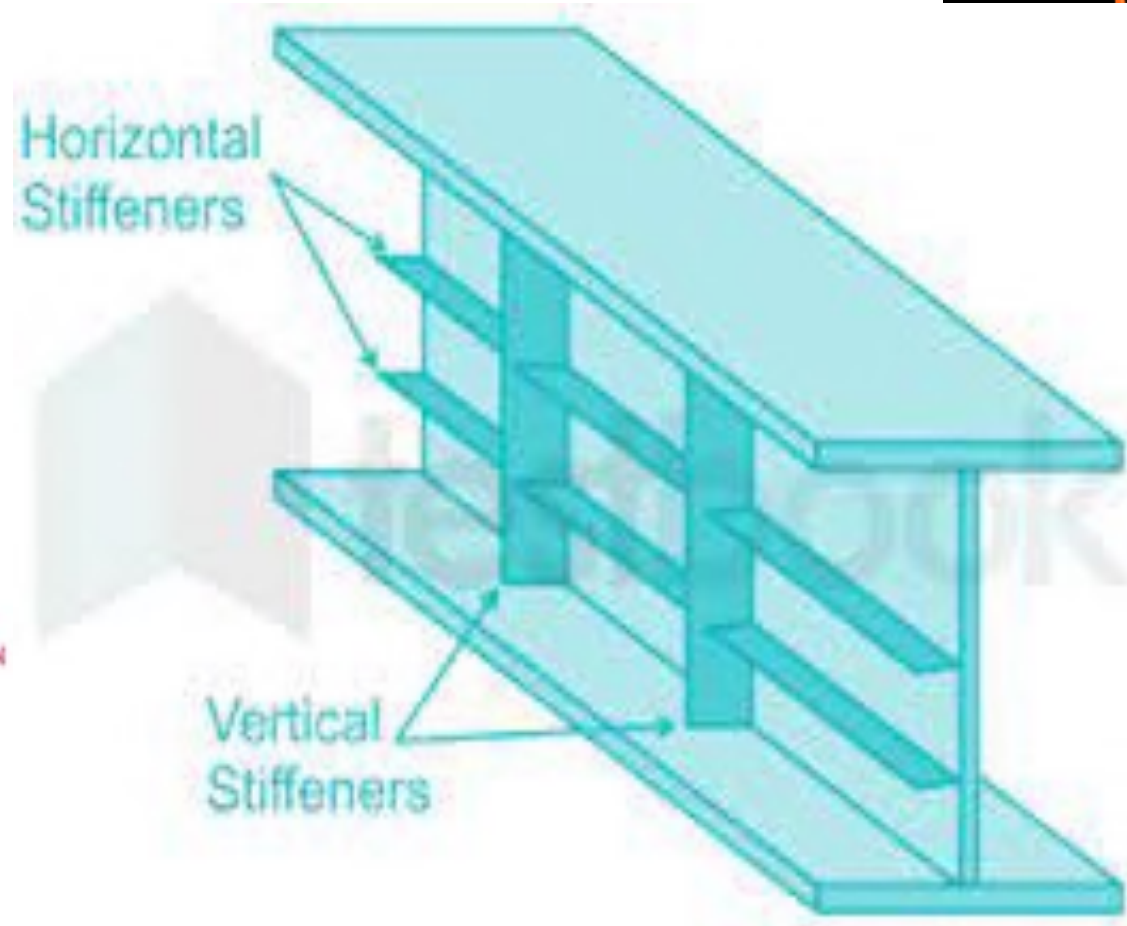
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Bearing stiffeners in plate girder are provided at:



THE CONSTRUCTIONS OF DEDUCTION



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**Adda247**

Which one of the following is an example of a composite section?

- (a) Reinforced concrete beam
- (b) Timber beam
- (c) Steel beam
- (d) Steel column

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Local word 'girder' refers to

- (a) I-beam
- (b) Channel
- (c) ISA section
- (d) Flat strips

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**Adda247**

Plates used in the top/bottom of the plate girders are called as

- (a) Stiffeners
- (b) End stiffeners
- (c) Cover plates
- (d) Web plates

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**Adda247**

Effective length of compression flange for unrestrained condition is

- (a)  $0.8 L$
- (b)  $1.8 L$
- (c)  $L$
- (d)  $1.65 L$

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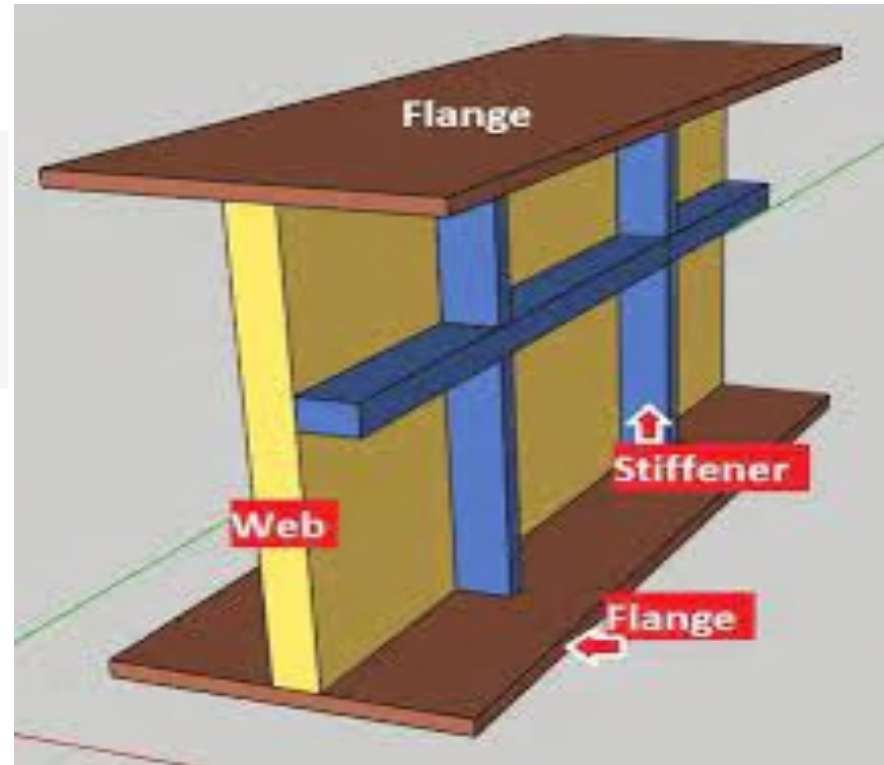
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For Fe 415 steel, if  $d/t_w \leq 67$  then plate girder (PG) must be designed as (Where  $t_w$  = thickness of web and  $d$  = depth of girder)

(Symbols and notations carry their usual meaning)

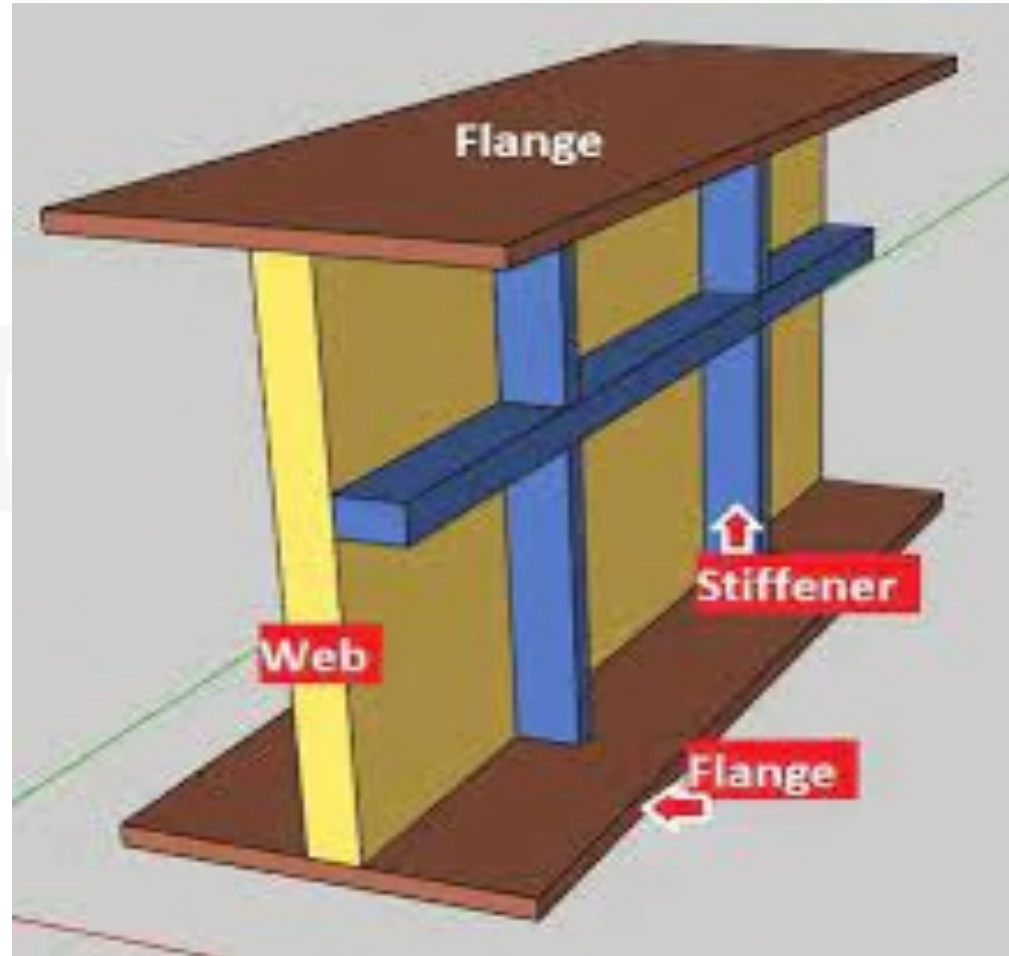
- (a) PG without transverse stiffener
- (b) PG as ordinary beam
- (c) PG with longitudinal stiffener
- (d) C-shaped section



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Which one of the following is correct for depth of plate girder in buildings?

- (a)  $L/15$
- (b)  $L/30$
- (c)  $L/40$
- (d)  $L/50$



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**Adda247**

The width and effective depth of a reinforced concrete beam are 300 mm and 500 mm respectively. The stresses induced in concrete and steel due to applied loads are  $4 \text{ N/mm}^2$  and  $140 \text{ N/mm}^2$  respectively, the material used is M-15 grade concrete and mild steel. What will be the depth of neutral axis? Take  $m = 19$

- (a) 142.5 mm
- (b) 202 mm
- (c) 168 mm
- (d) Insufficient data

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The working stress of a material is expected to be:

- (a) Equal to ultimate stress
- (b) Equal to yield stress
- (c) Less than yield stress
- (d) More than yield stress

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Factor of safety is the ratio of:

- (a) Tensile stress and working stress
- (b) Compressive stress and working stress
- (c) Bending stress and working stress
- (d) Yield stress and working stress.

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Adda247

Partial safety factors for concrete and steel respectively may be taken as:

OR

The partial safety factor for concrete is:

OR

The partial factor of safety for concrete as per IS 456 – 2000

- (a) 1.5 or 1.15
- (b) 1.5 or 1.78
- (c) 3 or 1.78
- (d) 3 or 1.2

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The reinforcement in RCC takes-

- (a) Tensile stress
- (b) Compressive stress
- (c) Shear stress
- (d) Torsional stress

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The section in which steel is not fully stressed to ----- value when stress in concrete reaches maximum value is called

- (a) Under-reinforced section
- (b) Over reinforced section
- (c) Balanced section
- (d) Critical section

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The maximum strain in the tension reinforcement in the section at failure shall not be less than

- (a)  $0.002 + (0.87 F_y Es)$
- (b)  $0.0035 + (0.87 F_y Es)$
- (c)  $0.0035 + (F_y/1.15 Es)$
- (d)  $0.002 + (0.85 Es/F_y)$

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The limiting values of depth of neutral axis for 500 grade of steel is -

- (a) 0.53
- (b) 0.48
- (c) 0.46
- (d) 0.5

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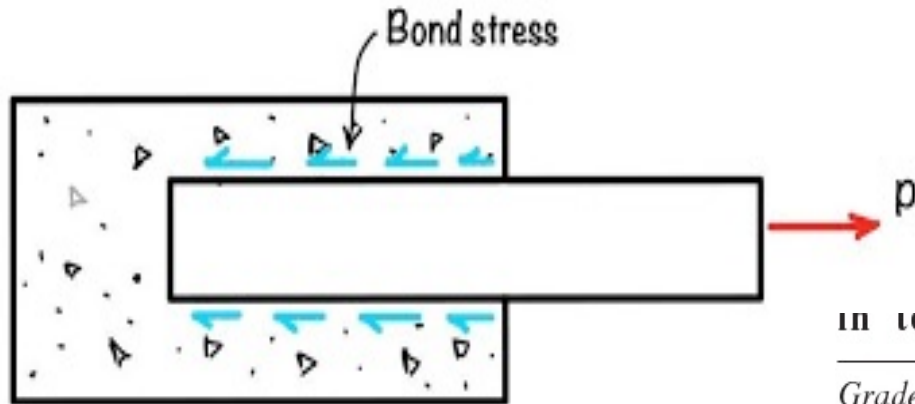
The design bond stress in limit state method for plain bars in tension for M-25 grade of concrete will be -

- (a)  $1.2 \text{ N/m}^2$
- (b)  $1.4 \text{ N/m}^2$
- (c)  $1.5 \text{ N/m}^2$
- (d)  $1.7 \text{ N/m}^2$

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The design bond stress in limit state method for plain bars in tension for M-25 grade of concrete will be -



in tension

Grade of concrete	M 20	M25	M30	M35	M 40 and above
Design bond stress, $\tau_{bd}$ , MPa	1.2	1.4	1.5	1.7	1.9
As per Equation (2), MPa	1.17	1.37	1.54	1.71	1.87

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Which of the following is not applicable to limit state method?

- (a) The stresses are obtained from design loads and compared with design strengths
- (b) The method follows linear stress-strain behavior of both the materials i.e. steel and concrete.
- (c) The ultimate stresses of the materials are used as allowable stresses
- (d) Partial safety factors are used

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**As per IS: 456-2000, the final deflection due to all loads including the effect of temperatures, creep and shrinkage and measured from the as-cast level of the support of floors, roofs and all other horizontal members, should not normally exceed -**

- (a) span/250**
- (b) span/350**
- (c) 20 mm**
- (d) Both (a) and (c)**

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As per IS: 456 the value of  $f_y$  at outermost tension fiber is-

OR

In limit state of collapse against flexure, the maximum strain in tension reinforcement at failure shall not be less than

(a)  $0.02 + (f_y/1.5 E_s)$

(b)  $0.0035 + (f_y/1.5 E_s)$

(c)  $0.002 + (f_y/1.5 E_s)$

(d)  $0.002 + (f_y/1.5 E_s)$

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**Adda247**

**A two hinged arches with hinged at -**

- (a) One at springing and other at crown**
- (b) Both at Springing**
- (c) One at crown and other at quarter span**
- (d) One at Springing and other at Quarter span**

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\_\_\_\_\_, support the masonry in opening of doors and windows.

OR

\_\_\_\_\_ is a beam that supports the brick work over opening of door, window and passage.

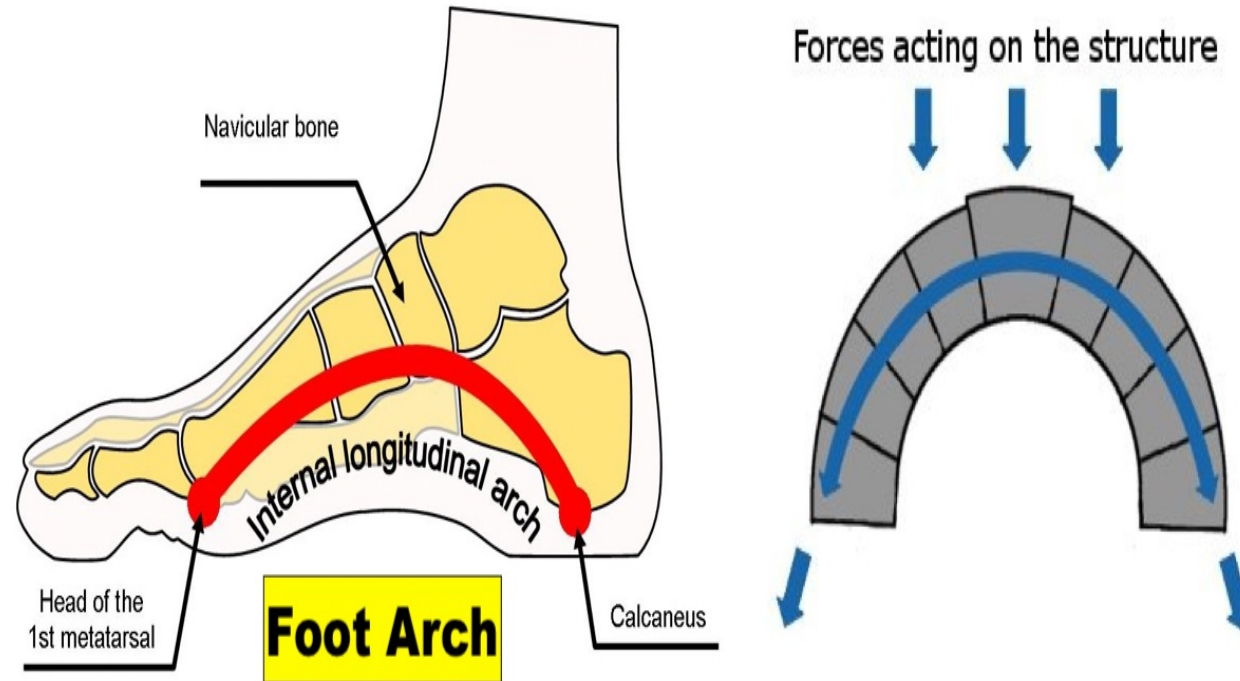
- (a) Lintels
- (b) Purlins
- (c) Girder
- (d) Rafters

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The arches support the loads mainly by:

- (a) Axial tension
- (b) Thrust
- (c) Shear
- (d) Bending



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The impurities in water such as floating objects, larger and heavy objects are removed by -

- (a) Screening
- (b) Filtration
- (c) Aeration
- (d) Sedimentation

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The device which is used for breaking large sized sewage solids to less than 6 mm size is called as \_\_\_\_\_.

- (a) Aerator
- (b) Grit remover
- (c) Digester
- (d) Comminutor .

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Consider the following impurities –

I. CO<sub>2</sub> and H<sub>2</sub>S

II. Finely divided suspended matter

III. Disease causing bacteria

IV. Excess alkalinity

the correct sequence of the removal of these impurities in a water treatment plant is -

(a) I, II, III, IV .

(b) I, IV, III, II

(c) I, IV, II, III

(d) IV, I, III, II

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The alum added as coagulant in water treatment function better when the raw water is:

- (a) Acidic with high turbidity
- (b) Alkaline with high turbidity.
- (c) Neutral with low turbidity
- (d) Acidic with low turbidity

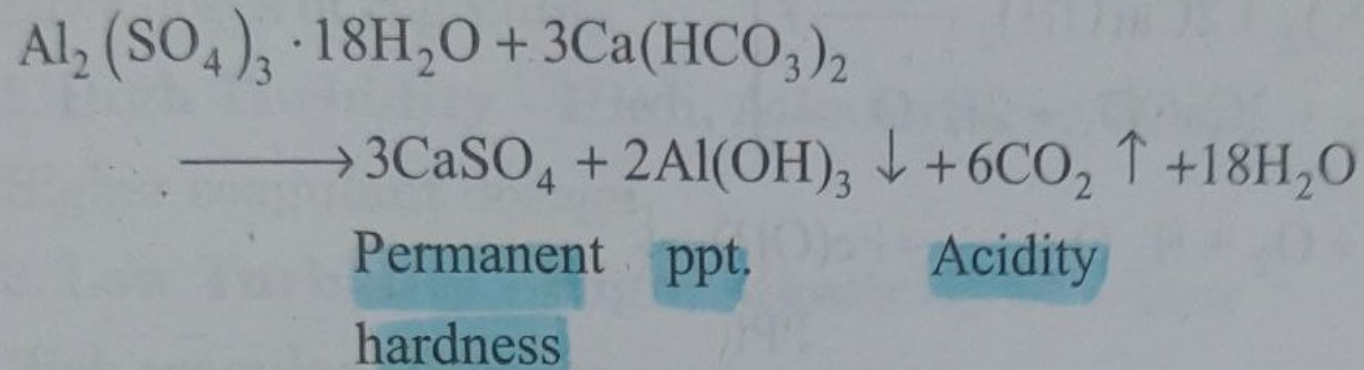
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TREATMENT OF WATER 9.21  
**Common Coagulants added in Water**

**(a) Alum**

- $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ .



- Reaction introduces permanent hardness in water and water becomes corrosive.
- Normal dose is 10 – 30 mg/litre of water . PHT
- pH 6.5 to 8.5.

∴ 1 gm of alum gives = 0.234g = 0.24 gm of  $\text{Al}(\text{OH})_3$  ppt

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The presence of sodium chloride in water

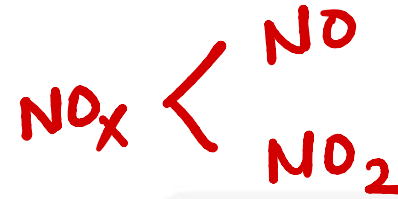
- (a) Causes bad taste
- (b) Softens the water.
- (c) Increases hardness of water
- (d) Stops epidemic

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Acid rains are caused by the following pollutants:

- (a)  $\text{SO}_2$  and  $\text{O}_3$
- (b)  $\text{SO}_2$  and  $\text{NO}_x$
- (c)  $\text{NO}_x$  and  $\text{O}_2$
- (d)  $\text{CO}$  and  $\text{SO}_2$



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Which of the following air pollutants is/are responsible for photochemical smog?

- (a) Nitrogen oxides
- (b) Ozone
- (c) Unburnt hydrocarbons
- (d) Carbon monoxide

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Aircraft noise is measured through

- (a)  $L_{10}$  (18 hrs) index
- (b) Decibel
- (c)  $L_c P_n$
- (d)  $L_{ep}$

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