Day2 Structural Analysis – II for ce

Q)A UDL of 4000 N/m covers left hand half of the span of a three hinged parabolic arch of span 36m and rise 8m.Determine the horizontal thrust--> **40,500N**

Q)Normal thrust in a three hinged parabolic arch of span l and rise h at centre having supports at same level is--> **N=Vsinθ+Hcosθ**

Q)If a three hinged arch carries a UDL throughout, every section of the arch resists only--> **normal thrust**

Q)A UDL of 4000N/m covers whole of the span of a three hinged arch,span 36m and central rise of 9m.The horizontal thrust will be--> **72000N**

Q)A three hinged arch of span l and rise h carries a UDL of intensity w/unit length. The hinges are located on two abutments at same level and the third at quarter span location from left abutment. The horizontal thrust on the abutment is--> **$wl^2/8h$**

Q)In a three hinged arch ,the shear force is usually maximum--> **at crown**

Q)If the axis of the arch coincides with the theoretical arch there is no ---------- in the arch--> **bending moment**

Q)The angle formed by the tangent to the arch axis at its springing is--> **$\theta = \tan^{-1}(4h/L)$**

Q)A three hinged parabolic arch of span l has its abutments at A and B at depths h1 and h2 below the crown C. The arch carries a concentrated load W at the crown. The horizontal thrust at each support is--> **$H = Wl/(\sqrt{h1} + \sqrt{h2})^2$**

Q)A three hinged arch of span 30m and rise 6m is subjected to a rise of temperature of 40 degrees .Determine the change in rise of arch if $\alpha = 12x10^{-6}$/degree centigrade.--> **20.9mm**

Q)Equation of parabola of rise y at any distance x from the springing with span/l and rise h is given by--> **$y = 4hx(l-x)/l^2$**

Q)Eddys theorem is stated as The bending moment at any point on the arch axis is ---------- to the vertical intercept between the theoretical arch and the axis of actual arch.--> **proportional**

Q)A three hinged parabolic arch rib with hinges at abutments and at crown is under UDL W/unit length over its entire span l through its crown.The bending moment at quarter span is--> **zero**

Q)A circular three pinned arch of span 40m and rise 8m is hinged at the crown and springing.It carries a horizontal load of 100kN per vertical metre on the left side.The horizontal thrust at the right springing will be--> **200kN**

Q)A three hinged arch consisting of two quadrantal parts AC and CB of radii R1 and R2. The arch carries a point load W on the crown. Horizontal thrust is--> **W/2**

Q)A three hinged semicircular arch of radius R carries a UDL of w/unit run over the whole span. Bending moment is maximum at θ =--> $30°$

Q)A three hinged arch of span 20m and rise 4m carries a UDL of 25kN/m.If arch is subjected to a rise in temperature of $40°$C ,take $\alpha = 12x10^{-6}$ per $°C$ find change in horizontal thrust--> **0.01392m**

Q)Three hinged arch is a ---------- beam--> **Statically Determinate**

Q)A three hinged parabolic arch of span 20m and rise 4m carries a UDL of 20kN/m on left half of the span. Determine the reactions--> **50kN,150kN**

Q)A three hinged semicircular arch of radius R carries a UDL of w/unit run over the whole span. Determine horizontal thrust--> **wR/2**

Q)A three hinged parabolic arch of span 20m and rise 4m carries a UDL of 20kN/m on left half

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of the span. Determine horizontal thrust--> **125kN**
Q)In a three hinged arch bending moment at crown is--> **= 0**
Q)A two hinged arch of radius R carries a concentrated load W making an angle α at the centre . Find the horizontal thrust at each support is--> **$W/\pi \sin^2\alpha$**
Q)Two hinged arch is a ---------- beam--> **Statically Indeterminate**
Q)A two hinged parabolic arch of span 24m and rise 4m supports a point load 15kN at a distance of 6m from A .Reaction at A--> **11.25kN**
Q)A two hinged semicircular arch of radius 20m carries a UDL of 10kN/m over the left half of its span. The horizontal thrust on the abutment is--> **42.44kN**
Q)A two hinged arch of radius R carries a concentrated load W at the crown . The horizontal thrust at each support is--> **W/π**
Q)A two hinged arch of radius 10m carrying a point load 100 kN at the crown .Determine the horizontal thrust--> **31.8kN**
Q)A three hinged semicircular arch of radius R carries a UDL of w/unit run over the whole span. Bending moment is zero at θ =--> 90°
Q)The horizontal thrust of a two hinged parabolic arch of span l and rise h subjected to any loading system is--> $\int Myds / \int y2ds$
Q)A two hinged parabolic arch of span 36m and rise 8m supports a udl of 40kN/m on left half of the span. Maximum positive bending moment will be--> **left span**
Q)A two hinged semicircular arch of radius 10m carries a load 50kN at a section the radius vector corresponding to which makes an angle 45^0 with the horizontal. The horizontal thrust is--> **7.95 kN**
Q)A two hinged semi circular arch of radius R carriers a UDL of w per unit run over the whole span the horizontal thrust is--> **$4wR/3\pi$**
Q)A two hinged semi circular arch of radius 10m is subjected to a rise of temperature of 40^0. Determine the horizontal thrust due to rise of temperature, take $E=2\times10^5$N/mm2,$\alpha=12\times10^{-6}$per degree centigrade,--> **122×10^{-8}I**
Q)A two hinged parabolic arch of span 24m and rise 4m supports a point load 15kN at a distance of 6m from A .Rise of arch at any point on arch is--> **x = x(24-x)/36**
Q)A two hinged parabolic arch of span 24m and rise 4m supports a point load 15kN at the crown .horizontal thrust is--------> **4.77kN**
Q)Two hinged arch is statically indeterminate of degree--> **1**
Q)A two hinged semicircular arch of radius R carries a load w at a section the radius vector corresponding to which makes an angle α with the horizontal. The horizontal thrust is--> **$w\sin^2\alpha/\pi$**
Q)A two hinged semi circular arch of radius 10m carriers a UDL of 10kN per unit run over the whole span the horizontal thrust is--> **21.22kN**
Q)A two hinged semi circular arch hinged at one end and roller support at other end has radius 15m carriers a UDL of 50kN per unit run over the whole span, the horizontal thrust at roller support is--> **0**
Q)In bridge construction more frequently used arch is--> **two hinged arch**
Q)A three hinged semicircular arch of radius R carries a UDL of w/unit run over the whole span. We have maximum negative bending moment at θ =--> **30^0**

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Q)A two hinged semi circular arch of span 20m and rise 4m carriers a UDL of 50kN per meter on left half span. The horizontal thrust is--> **312.5kN**
Q)The bending moment and shear force is ----------for two hinged simply supported arch than two hinged fixed arch--> **more**
Q)A two hinged semi circular arch of span l and rise h carriers a UDL of w per meter on left half span. The horizontal thrust is--> **$wl^2/16h$**
Q)A two hinged semi circular arch of radius R carriers a UDL of w per unit run over the whole span, the horizontal thrust at roller support is--> **0**
Q)Internal hinges are at ---------- of columns in portal method--> **center**
Q)In portal method shear carried by interior columns is assumed to be ------- of that of the exterior columns.--> **twice**
Q)Portal method is used in --------- building frames.--> **low rise**
Q)An inflexion point occurs at the -------- of each column.--> **mid height**
Q)Which is approximate method of following?--> **portal method**
Q)Internal hinges are at ---------- of beams in portal method--> **center**
Q)The line of thrust is known as ----------> **Linear arch**
Q)Shear force in a section of arch is known as--> **radial shear**
Q)Axial stress in a ---- ---- is proportional to its distance away from the centroid of the cross-sectional area of columns.--> **column**
Q)Point of contraflexure will lie at ---------- of each member in portal method.--> **middle**
Q)---------- will act at the point of contraflexure in the member.--> **horizontal shear**
Q)Horizontal shear for outer columns will be ---------- of inner columns--> **double**
Q)For tall and slender building frames under lateral loads, the ------ frame acts similar to cantilever beam sticking out of the ground.--> **entire**
Q)Axial compression and tension forces develop to counteract the ----------> **b & c**
Q)An inflexion point occurs at the -------- of each girder.--> **mid point**
Q)Cantilever method is used in ---------- building frames.--> **A & B**
Q)If l is the span of beam and moment m acting at each end of beam,then each beam will be imposed to upward pull of push of---------> **2m/l**
Q)---------- columns will experience vertical reactions--> **end column**
Q)The windward column will have ---------> **upward pull**
Q)A span of beam on either sides of a column are equal ,the --- will be neutralised--> **bending moment**
Q)The total horizontal load is divided between the base in proportion to their-------> **spans**
Q)Each bay acts as a simple ----------> **portal**
Q)The moment acting at each end of beams give rise to ---------- in columns--> **vertical reactions**
Q)Horizontal loads are applied at ---------- levels--> **Floor**
Q)If m1 and m2 are moments at the ends of the beam of span l with no external vertical force acting on beam then shear F is ----------> **m1+m2/l**
Q)The methods used to analyse lateral loads in portal frames--> **both A&B**
Q)Consider a single bay portal frame ABCD of beam span 6m and height of columns 8m subjected to a horizontal load 20kN at joint B, then bending moment at upper and lower end of each column is--> **40kNm**
Q)The lee ward column will have ----------> **downward push**

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Q)Shear for any beam in a frame is--> **bending moment at the beam end /half span of the beam**

Q)If M is the end moment of a beam and l the span of beam then push in exterior leeward column is--> **2M/l**

Q)Consider a single bay portal frame ABCD of beam span 6m and height of columns 8m subjected to a horizontal load 20kN at joint B, then horizontal shear for each column is--> **10kN**

Q)If horizontal shear at point of contraflexure is H and height of column is h then moment at the column end as per cantilever method is ----------> **Hh/2**

Q)A building frame is subjected to horizontal forces due to--> **wind pressure**

Q)If shear in the beam is F the length of beam is l as per cantilever method moment at the end of the beam is = ----------> **Fl/2**

Q)In portal method horizontal shear taken by each interior column is ---------- the horizontal shear taken by each Exterior column--> **Doubled**

Q)In cantilever method Point of contaflexure in each beam lies at--> **mid span**

Q)In cantilever method Point of contaflexure in each column lies at--> **mid height**

Q)Direct stresses in the column due to ---------- are directly proportional to their distance from the centroidal vertical axis.--> **horizontal forces**

Q)Horizontal thrust H at each column hinge is obtained by rotational equilibrium about the ---------- at appropriate level.--> **beam hinges**

Q)The axial force in the beam in cantilever method is evaluated by considering the ------ of each joint.--> **horizontal**

Q)Direct forces in columns for cantilever method is determined by considering ---------- equilibrium--> **rotational**

Q)The horizontal forces cause ---------- in columns--> **axial forces**

Q)Structural behavior of multistory buildings subjected to lateral forces is complex and--> **highly indeterminate**

Q)The ability of multi-storey building to resist the wind and other lateral forces depends upon the ---------- of the beam column connections.--> **rigidity**

Q)Cantilever method is applicable to buildings with height to width ratios between----------& ----------> **1& 5**

Q)Portal method is recommended for analysis of structures upto -------- storeys--> **25**

Q)Portal method is recommended with height to width ratio not greater than -------> **4:1**

Q)In Cantilever method member forces are evaluated considering individual member as ----- when subjected to horizontal loading.--> **cantilever**

Q)Which method is used for the analysis of buildings subjected to vertical loading--> **Substitute frame method**

Q)The moments in each member are obtained by considering the ----------equilibrium of individual members in cantilever method.--> **static**

Q)Cantilever method is used for ----------and ---------- frame--> **tall & more slender**

Q)Cantilever method is recommended for analysis of structures upto ---------- storeys.--> **35**

Q)Before the deck is installed, the cables are under----------from only their own weight--> **tension**

Q)The stiffener girder transfers uniformly distributed or equal load to each ----------> **suspender**

Q)Triangulated bracing between the cables ---------- the amplitude of oscillations--> **reduces**

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Q)Suspension bridges are used in highways, where the span of the bridge is more than _____ m--> **200**

Q)Suspension bridges consists of--> **all the above**

Q)In Suspension bridges the traffic load of decking is transferred to main cables through -----> **suspenders**

Q)---------- is the main load bearing members in Suspension bridges--> **cables**

Q)Horizontal component of cable tension at any point is equal is ----------> **H**

Q)The suspenders in the Suspension bridges are ----------> **Vertical**

Q)What is the horizontal reaction in cable supporting a UDL of intensity p per unit length if length is L and dip is d--> **$pL^2/8d$**

Q)The bending at any point on the cable is ----------> **Zero**

Q)--------- consists huge mass of concrete--> **anchorage**

Q)Suspenders consists of ------b----------> **round rods or ropes**

Q)The tension on the cables must be transferred to the earth by the ----------> **Anchorage**

Q)Primary design depends on as how to proportion the geometry of a cable in terms of its ----------> **Sag-Span ratio**

Q)The extension of a cable under a load P having Length l, A as area of cross section and E as youngs modulus is given as ----------> **Pl/AE**

Q)The geometry of a cable is defined by ---------- between its supports and ----------> **Horizontal distance and Dip**

Q)The suspension cable is supported on either sides on the supporting ----------> **towers**

Q)Suspension cable can be attached to a saddle mounted on ----------> **rollers**

Q)Suspension cables can be passed over the guide ------ for anchoring--> **pulley**

Q)A flexible cable exerts ---------- in the direction of the cable--> **tension**

Q)For a cable in the form of a catenary having the horizontal and vertical forces as H and V maximum tension is--> **2 x** $\sqrt{H^2+V^2}$

Q)A cable carrying a load that is uniformly distributed along its horizontal projection will deform into ---------- shape--> **parabolic**

Q)For a cable in the form of a catenary under vertical uniformly distributed load 10 N/m having length 4 m and dip as 0.4 m the vertical force is--> **20**

Q)The tension in a circular arc having a radial load of p, radius R and area A is given by--> **pR**

Q)The radius of the circular arc having Length 4m and dip 0.4m is--> **5.2**

Q)A cable of a constant cross section carrying only its own dead weight naturally deforms into a ---------- shape--> **catenary**

Q)For a cable in the form of a catenary under vertical uniformly distributed load 10 N/m having length 4 m and dip as 0.4 m the horizontal force is--> **50**

Q)If the tension in the anchor and suspension cable is T and the inclination of anchor and suspension cable with vertical is α_1 and α_2 respectively Then horizontal component is given by --> **$T \sin\alpha_1 - T \sin\alpha_2$**

Q)The saddle will not have ----------reaction--> **horizontal**

Q)If the tension in the anchor and suspension cable is T_A and T_C respectively and the inclination of anchor and suspension cable with vertical is α_1 and α_2 vertical component is given by --> **$T_C \cos\alpha_1 + T_A \cos\alpha_2$**

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Q)What are the disadvantages of having straight cable?--> **High moment and large deflection**
Q)When a cable is suspended from supports at a different levels it forms general ---------- shape--> **Curved**
Q)For a parabolic cable the equation to determine the profile of the cable is -----a---------> **Y=** $\frac{4h}{L^2}(L-x)$
Q)The segment of the cable between the tower and the anchoring point is called -------- --> **anchor cable**
Q)Determine the length of cable subjected to four equally spaced identically loads if the span is 10m and maximum sag is 3m--> **12.52m**
Q)A cable supported at same level between two points spanning at a distance of 200m,if it carries UDL of 30kN/m horizontally and the central dip is 10m,Find horizontal thrust--> **15000kN**
Q)A cable of span 100m and a dip of 5m is subjected to a rise of temperature 15^0.Find the increase in dip due to rise in temperature--> **67mm**
Q)The minimum tension in a cable carrying a UDL is, where H is horizontal force--> **H**
Q)If the cable is subjected to point load at different locations ,it takes ---------- shape--> **funicular**
Q)Calculate the vertical intercept at 10m away from left support for a SS cable having length 40m and having a load 50kN at 10m away from left support and 20kN load at 10m away from right support--> **4.33m**
Q)Find the minimum tension for a cable having horizontal and vertical reactions equal to 10kN--> **10kN**
Q)A cable supported at same level between two points spanning at a distance of 200m,if it carries UDL of 30kN/m horizontally and the central dip is 10m,Find maximum tension--> **15300kN**
Q)Find the maximum tension for a cable having horizontal and vertical reactions equal to P--> **P** $\sqrt{2}$
Q)Find the minimum tension for a cable having horizontal and vertical reactions equal to P--> **P**
Q)Calculate the vertical intercept at 10m away from left support for a SS cable having length 40m and having a load 50kN at 10m away from left support and 20kN load at 10m away from right support--> **3.33m**

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