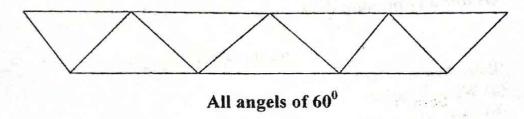
SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR Total number of pages:[] ROLL No: B.Tech. || CE || 4th Sem Structural Analysis-1 (RG/RP) Subject Code: BTCE-401A Paper ID: M/18 (2015 balch orwards) Time allowed: 3 Hrs Max Marks: 60 Important Instructions: All questions are compulsory Assume any missing data PART A (10x 2marks) Q. 1. Short-Answer Questions: (a) What is the basic difference between the methods of joints and method of section? (b) How would you draw the influence line for a shear force for a point in cantilever? (c) How would you find the horizontal reaction for a uniformly loaded cable? (d) Explain a Conjugate Beam? (e) How would you calculate the bending moment at a point for a uniformly distributed load shorter than the span from the ILD? (f) How would you draw the shape of cable carrying a number of point loads? (g) State the "Muller Breslau's Principle for plotting the influence line diagram? (h) What are Zero force members? Why are they required? (i) State Maxwell's Betti's theorem? (j) What is the difference between two hinged and three hinged arch? PART B (5×8marks) How would you find the slope and deflection for a Cantilever beam with a CO1 Q. 2. uniformly distributed load 'W' over the entire span using the "Conjugate beam Method". OR How would you find the slope and deflection for a Simply Supported beam CO1 with a uniformly varying load from zero at one end and 'W' at other end using the "Macaulay's Method" Analyse the parallel Chord truss shown in the fig 4 below by the Method of CO₂ Q. 3. Joint. Assume the forces and the sign conventions in each member. 8 kN 20 kN 18 kN 4 m 4 m $2 \, \mathrm{m}$

State castigliano's first theorem and its application.

- Q. 4. Three wheel loads 60KN, 40KN and 50KN spaced 2m and 2m respectively CO3 roll on a simply supported girder of span 20m from left to right with the 60KN load leading, find the following:
 - a) Maximum bending moment that can occur at a section 8m from the left support.
 - b) Maximum bending moment that can occur under 40KN load.
 - c) Absolute maximum bending moment for the girder.

OR

A warren girder having a span of 30 m consists of four equal panels shown in figure. Plot the influence line 'for force in all the members



Q. 5. The 3 hinged stiffening girder of a suspension bridge of span 120 m is CO4 subjected to two point loads 240 kN and 300 kN at distance 25 m and 80 m from the left end. Find the S.F and B.M for the girder at a distance 40 m from the left end, dip is 12 m. Find also T_{max} and draw the B.M diagram.

OR

A Suspension bridge with Three hinged stiffening girder has span of 100mand central dip of 10m. The self weight of the bridge carried by one set of cable is 15KN/m. The bridge is to be designed to carry a live load of 30KN/m to be equally divided between two sets of cables. The working stress is 15KN/cm² for cable and 120KN/cm² for girder. Find (a) Cross sectional area of one set of suspension cable. (b) The Section modulus of the stiffening girder.

Q. 6. A masonary dam of Trapezoidal section is 9 m high retaining water upto the top. The water face of the dam is vertical. If the top width of the dam is 1.5 m find the minimum bottom width required to avoid tension in the masonary. Water and masonary weigh 9810 N/m³ and 22000N/m³ respectively.

OR

A masonry Retaining wall of trapezoidal section 8m high 2.5m wide at top CO5 and 4.5 m wide at the bottom. The earth face of wall is vertical. The soil is level with top of the wall. Find the maximum pressure intensities at the base of wall. Soil weighs 16000N/cum with angle of repose of 30 degree. Masonry weight 22500N/cum.