

**BHARTIYA INSTITUTE OF ENGINEERING & TECHNOLOGY,
SIKAR
DEPARTMENT OF CIVIL ENGINEERING
QUESTION BANK
SUBJECT= THEORY OF STRUCTURE-II (6CE1A)**

1. State the Muller Breslau's principal and explain the influence line diagram with suitable example.
2. Two wheel loads of 16 kN & 8 kN at a fix distance apart of 2 m crosses a beam of 20 m. Draw the influence line for bending moment & Shear force for a point of 4 m from the left abutment and find the maximum B.M. & S.F. at the point.
3. The system of wheel loads 16 kN, 16 kN, 20 kN, 20kN & 20kN. Center to centre distance is 3m, 3m, 4m, 4m crosses a span of 25 m. Find the maximum value of Bending moment & Shear force.
4. Make neat diagram of influence lines for shearing force and bending moment at a section **3m** from the one end of a simply supported beam, **15m long**. Use the ILD diagram to calculate the MAX. S.F and bending moment at this section due to udl rolling load 6 m long of 2 kN/m intensity.
5. A parabolic arch hinged at the springings and crown has a span of 30 m. The center rise of arch is 4 m. It is loaded with a udl of 2 kN/m on the left 6 m length.
 - (a) Calculate the direction & Magnitude of a reaction at the hinges.
 - (b) The bending moment, normal thrust and shear at 8 m and 20 m from the left abutment.
Maximum positive and negative bending moment
6. A suspension cable 160 m span and 16 m central dip carries a load of $\frac{1}{2}$ KN per lineal meter. Calculate the maximum and minimum tension in cable. Find the horizontal and vertical forces in each pier under the following alternative condition.
 - (a) If the cable passes over frictionless rollers on the top of the piers.
 - (b) If the cable is firmly clamped to saddle carried on frictionless roller on the top of the piers.
In each case the back stay is inclined at 30 degree to the horizontal.
7. Give the following expression for uniformly loaded cable.
 - (a) Expression for Horizontal reaction
 - (b) Expression for cable tension at the ends
 - (c) Length of the cable (1) both ends at the same level (2) Ends at different levels
8. A beam of rectangular section **80 mm** wide and **120 mm** deep is subjected to a bending moment of **15 KNm**. The trace of plane of loading is inclined at **45 degree** to the YY axis of the section. Locate the neutral axis of the section and maximum bending stress induced in the section.

Define the following terms.
9. (a) Moment of Inertia (b) Shear centre (c) Centroid (d) Principal axes
- 10 Explain flexibility and stiffness .What is flexibility and Stiffness matrix.

