

BHARTIYA INSTITUTE OF ENGINEERING & TECHNOLOGY, SIKAR

DEPARTMENT OF CIVIL ENGINEERING

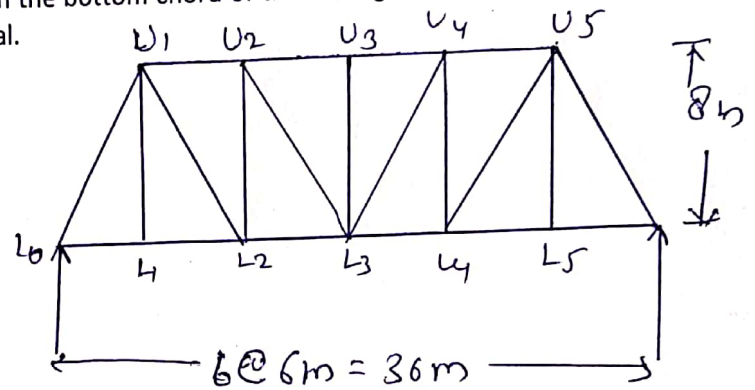
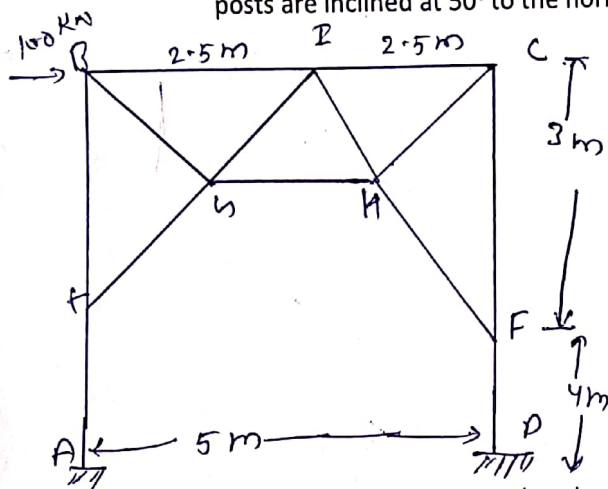
IMPORTANT QUESTION BANK – 8CE2A DSS-II

- Q. 1 Design a gantry girder for an industrial building, to carry an E.O.T. crane, from following data -
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|--|----------|
| (i) Crane capacity | = 150 kN |
| (ii) Weight of crane excluding trolley | = 100 kN |
| (iii) Weight of trolley | = 40 kN |
| (iv) Span of crane | = 12 m |
| (v) Span of gantry girder | = 7 m |
| (vi) Minimum approach of hook | = 1.0 m |
| (vii) Wheel base | = 3.0 m |
- Q. 2 A plate girder , simply supported at the ends has effective span 16 m. It carries a superimposed load of 25 kN/m over the whole span. Assuming compression flange of the girder to be laterally supported, design the section at mid-span. Also design the welds connecting flange plates and web. Do not design stiffeners.
- Q. 3 Design a welded plate girder 24m in span and laterally restrained throughout. It has to support a uniform load of 100 KN/m throughout the span exclusive of self-weight. Design plate girder using intermediate transverse stiffener. Connections need not to be designed, grade of steel using is of Fe 410.
- Q. 4 Design an overhead circular steel tank with hemispherical bottom, for a capacity of 1,80,000 ltrs. It is supported on 8 columns uniformly placed along periphery, for which $M=0.00827WR$, $T=0.00063WR$ and $F=W/16$ may be taken.
- Q. 5 Design a deck type plate girder bridge for single track B.G main line loading, for following data:
- | | |
|--------------------------------|-----------------------------------|
| (i) Effective span | = 24 m |
| (ii) Spacing of plate girder | = 1.9 m c/c |
| (iii) Weight of stock rails | = 440 N/m |
| (iv) Weight of guard rails | = 260 N/m |
| (v) Weight of fastening etc. | = 280 N/m of track |
| (vi) Size of sleepers (timber) | = 2.8m x 250mm x 150mm @ 0.4m c/c |
| (vii) Density of timber | = 7.4 KN/m ³ |
- Q. 6 Design an elevated two tier, rectangular pressed steel tank having capacity 125 k litres. Design the stays also and draw their arrangements. Show loads transferred to an intermediate top tier beam. Do not design the beam.

Q. 7 Determine the increase in stresses in the flanges of leeward girder due to overturning effect of wind when (A) bridge is unloaded and (B) bridge is loaded, for a deck type plate girder railway bridge, B.G, from following data-

- (i) Effective span of bridge = 25 m
- (ii) Spacing of plate girders c/c = 2.0 m
- (iii) Overall depth of the section of girder = 2.1 m
- (iv) Height of rail section = 150 mm
- (v) Height of sleepers = 150 mm

Q. 8 An 'A' type portal bracing has been used in a through type truss girder bridge. It is subjected to a lateral horizontal force of 100 kN as shown in fig. Analyse the frame completely. Also find the portal effect in the bottom chord of the truss girders, if the end posts are inclined at 50° to the horizontal.



Q. 9 Draw ILD for forces in member due to U_2U_3 , L_2L_3 and U_1L_1 of a pratt truss as shown in fig. 2.