

Day : Thursday
Date : 18/01/2018

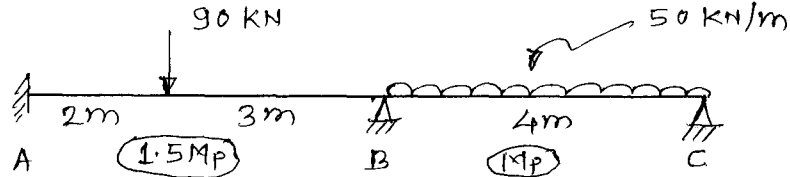
Time : 02.30 PM TO 05.30 PM
Max. Marks : 60

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N.B.:

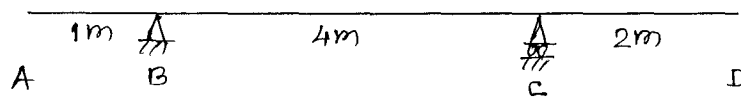
- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Assume suitable data if necessary.

Q.1 The beam is loaded with ultimate loads as shown in figure. Find value of plastic moment 'Mp'. [10]



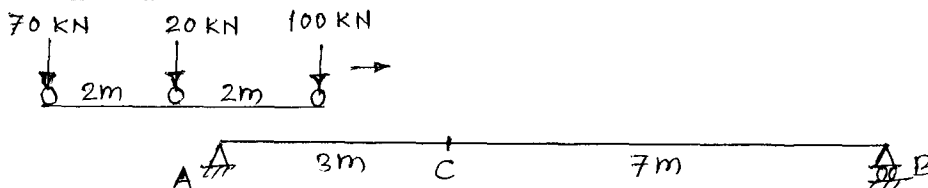
OR

- a) What is shape factor? Explain its significance. [05]
 - b) Find out plastic moment capacity of rectangular section of width 150 mm and depth 300 mm. Take $\sigma_y = 250 \text{ N/mm}^2$ in tension and compression. [05]
- Q.2 a) What is Muller-Breslau principle? How it is applied? [05]
- b) Draw an ILD for support reactions for the beam shown in figure. [05]

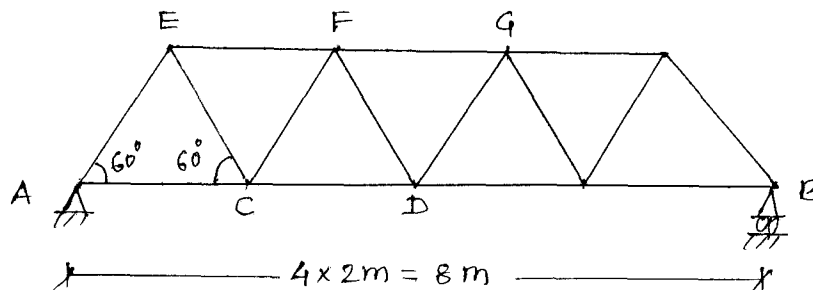


OR

A train of three point loads moves over the beam AB as shown in figure. Calculate maximum values for support reaction at A, shear force and bending moment at C. [10]



Q.3 Draw an ILD for forces in the members CD, FD and FG for the truss shown in figure. [10]



OR

An udl 50kN/m of length 6 m moves over truss shown above (Q.3). find out maximum force developed in members AE and AC.

P.T.O.

Q.4 a) How an arch will sustain more load than beam? [05]

b) A three hinged parabolic arch of span 20 m and rise 5 m is subjected to load 150 kN at 4m distance from left support. Calculate bending moment developed under the load. [05]

OR

A three hinged parabolic arch of span 30 m and rise 5 m is subjected to an udl of 60 kN/m over left half portion. Calculate Normal thrust and Radial shear developed at section 4 m from left support. [10]

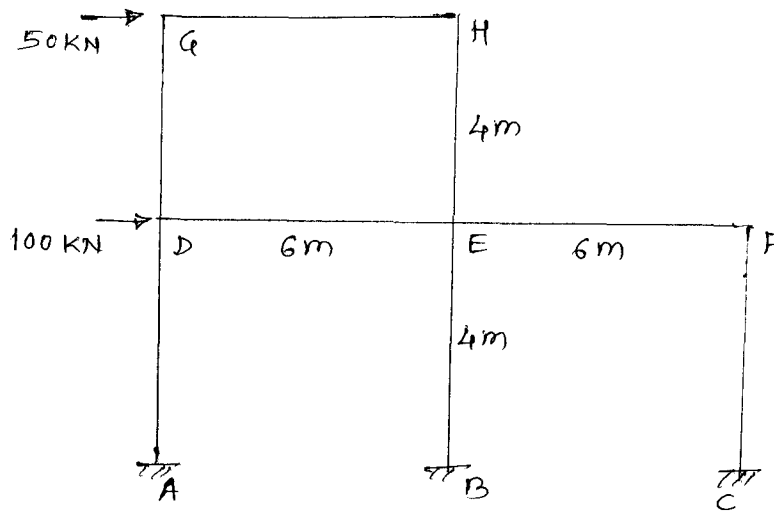
Q.5 a) Derive an equation for horizontal thrust of two hinged arch. [05]

b) A two hinged parabolic arch of span 40 m and rise 7 m is subjected to point load of 60 kN at mid-span and an udl of 50 kN/m over whole span. Calculate horizontal thrust at supports. [05]

OR

A two hinged parabolic arch of span 30 m and rise 5 m is subjected to an udl of 40 kN/m over right half portion. Calculate Normal thrust and Radial shear at 7 m from left support. [10]

Q.6 Analyse the frame shown in figure using cantilever method. [10]



OR

Analyse the frame shown above in Q.6 using portal method. [10]

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