BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE **SEMESTER : IV**
BRANCH: CIVIL **SESSION : SP/19**

SUBJECT: CE4001 STRUCTURAL ANALYSIS-I

TIME: 3:00 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall

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Q.1 Find the reactions of the compound beam shown in fig (i) [12]

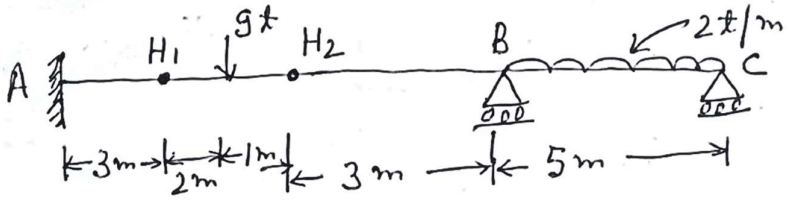

Fig (1)

Q.2 Determine the horizontal defection of the roller support B of the plane truss shown in fig (2) Take EA=50000 t for each member. Use unit load method. [12]

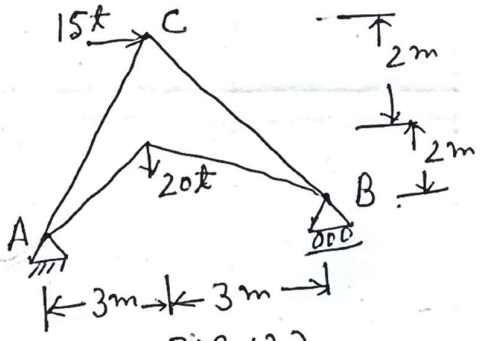

Fig (2)

Q.3(a) A simply supported girder carries a uniformly distributed load an the part CD as shown in fig(3). Determine the reaction Vb at B using influence line diagram. [6]

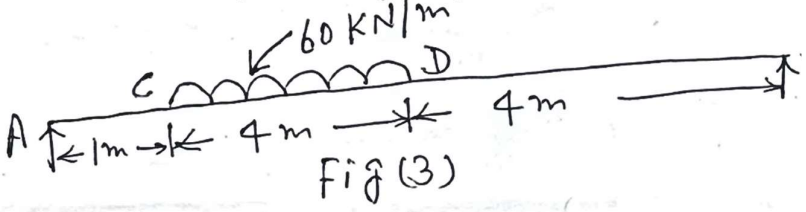

Fig (3)

Q.3(b) Two wheel loads 80 KN and 200KN spaced 2m apart move along a girder of span 16 metres. Find the maximum positive and negative shear force at a section 4 metres from the left end. Any wheel load can load the other. Use influence line diagram method. [6]

Q.4 A three hinged Arch has span of 30m and rise of 10m. The arch carries a uniform distributed load of 60KN/m run an the left half of its span. It also carries two concentrated loads of 160 KN and 100KN at 5m and 10m from the right end. Determine horizontal thrust the Arch is parabolic. [12]

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Q.5 A foot bridge in carried over a river of span 90m. Supports are 3m and 12m higher than the lowest paint of the cable. Determine the length of the cable. [12]

Q.6 A masonry dam 8m high, 1.5m wide at the top and 5m wide at the base retains water to a depth of 7.5m the water face of the dam being vertical. Find the maximum and minimum stress intensities at the base the weight of water is 9810N/cum while the weight of masonry 522000N/cum. [12]

Q.7 Find the deflection at the free end of a cantilever carrying a concentrated load P at the free and assume uniform flexural rigidity. Use first theorem of Castiglia no. [12]

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