UKA TARSADIA UNIVERSITY

B.Tech (Mechanical) (Semester 2)
030050206(2015-16)
Mechanics of Solids

Date :10/12/2021 **Time :**9:30AM- 12:30PM
Max. Marks:60

Instructions :

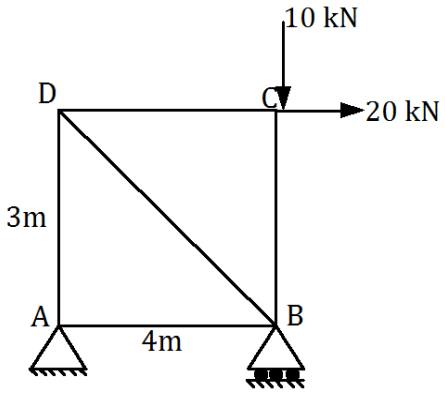
1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Draw diagrams/figures whenever necessary.
5. Figures to the right indicate full marks allocated to that question.
6. Follow usual meaning of notations/abbreviations.

SECTION - 1

Q 1 Answer the following (Any 1) **[6]**

I) Explain in detail stability and determinacy of truss.

II) Analyse the truss shown below, which carries 10 kN of vertical force and 20 kN of horizontal force at joint C.



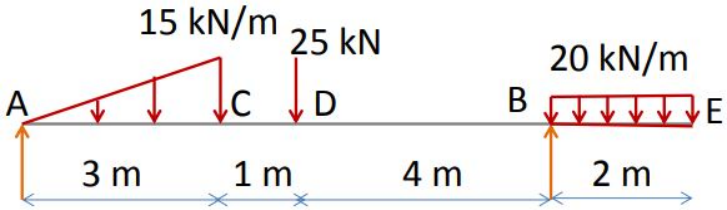
Q 2 A) Answer the following in brief. (Any 1) **[2]**

I) Distinguish clearly between uniformly distributed load, uniformly varying load and triangular load.

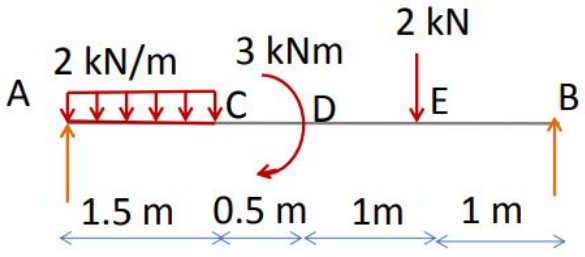
II) Define the term “point of contraflexure”.

Q 2 B) Answer the following in detail. (Any 2) **[10]**

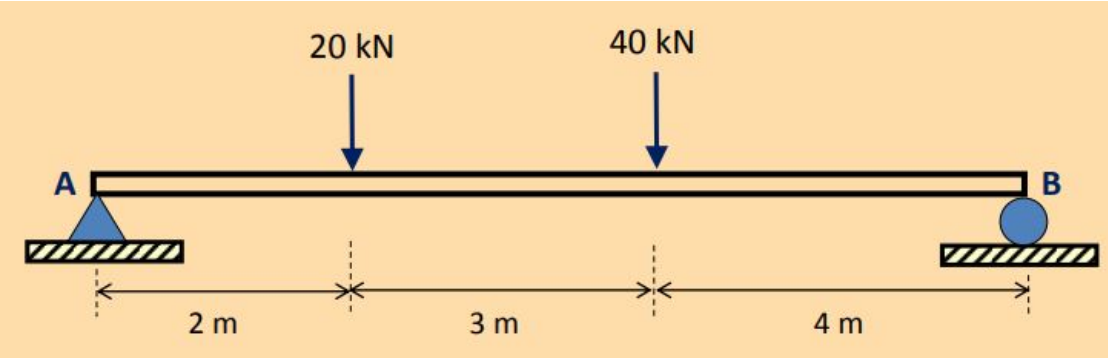
I) An over hanging beam of length 10 m is loaded as shown in figure. Draw the S.F.D. and B.M.D.



II) A simply supported beam is loaded as shown in figure. Draw the S.F.D. and B.M.D.



III) The beam shown below is supported by a pin at A and roller at B. Draw the S.F.D. and B.M.D.



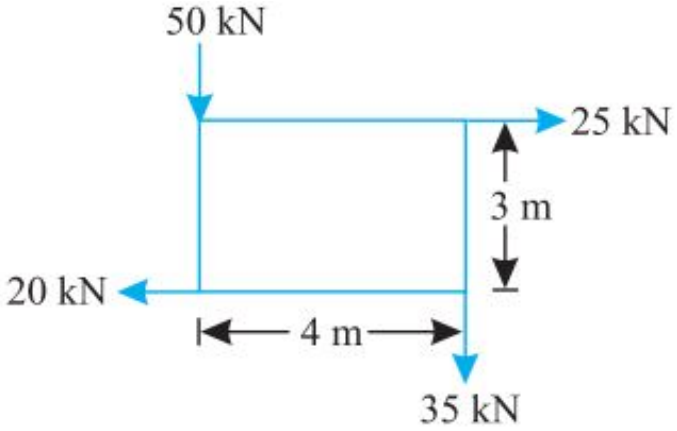
Q 3 A) Answer the following in brief. (Any 1) **[2]**

I) If P = 50 kN and Q = 35 kN and the angle between two force is 60° then find the resultant in terms of magnitude & direction with the help of parallelogram law of forces.

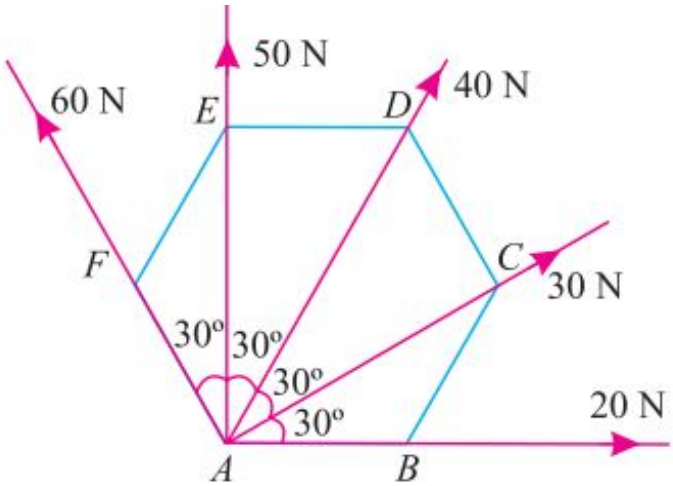
II) Explain scalar quantity and vector quantity.

Q 3 B) Answer the following in detail. (Any 2) **[10]**

I) A system of forces are acting at the corners of a rectangular block as shown in figure. Determine the magnitude and direction of the the restltant force.



II)



The forces 20 N, 30 N, 40 N, 50 N and 60 N are acting at one of the angular points of a regular hexagon, towards the other five angular points, taken in order. Find the magnitude and direction of the resultant force.

III) Explain the force system in detail.