

Date: \_\_\_\_\_

①

ASSIGNMENT:

STRUCTURAL ANALYSIS  
TRUSSES  
No: 2

NAME:

MALIK AIMAL KHAN

I D:

7968

SECTION:

B

DATE:

11-07-2020

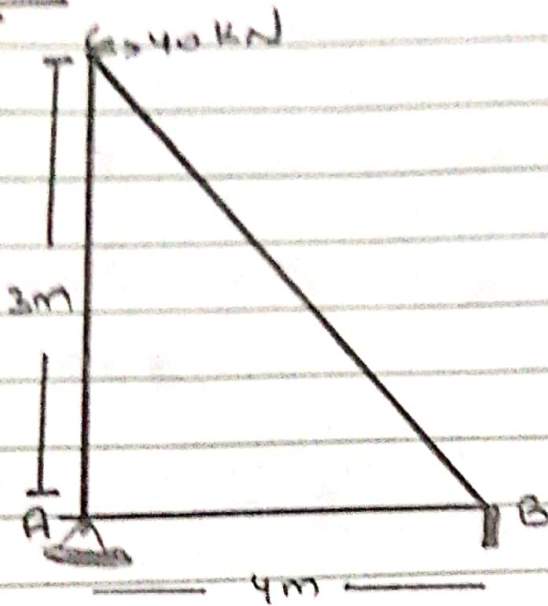
SUBMITTED TO:

SIR AMJAD ISLMA:

Date:

(2)

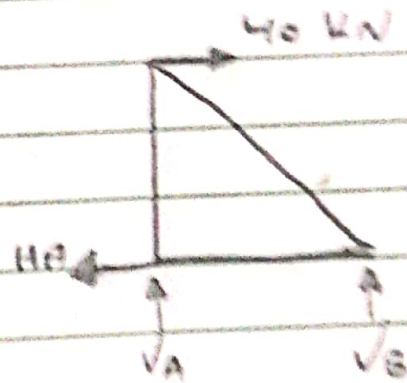
Ans of Q No 1:  
FIGURE:



SOLUTION:

$$\sum F_x = 0$$
$$-H_A + 40 = 0$$

$$H_A = 40 \text{ kN}$$



$$\sum M_A = 0$$

$$-V_B \times 4 + 40 \times 3 = 0$$

$$V_B = \frac{120}{4}$$

$$V_B = 30 \text{ kN}$$

Date: \_\_\_\_\_

(3)

$$\sum M_B = 0$$

$$V_A \times 40 + 40 \times 3 = 0$$

$$V_A = -30 \text{ kN}$$

$$V_A = -30 \text{ kN}$$

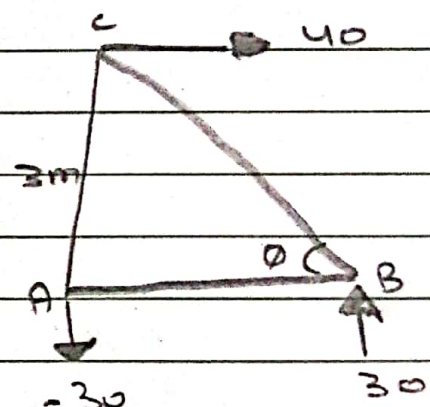
So the direction we assumed was wrong.

For angle  $\theta$

$$\tan \theta = \frac{3}{4}$$

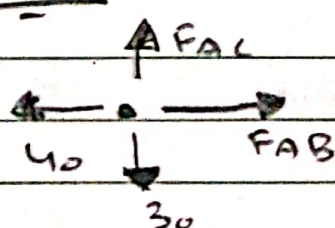
$$\theta = \tan^{-1} \left( \frac{3}{4} \right)$$

$$\theta = 36.87^\circ$$



By JOINT ANALYSIS:

JOINT A:



$$\sum F_x = 0$$

$$F_{AB} - 40 = 0$$

$$F_{AB} = 40 \text{ kN}$$

$$F_{AB} = 40 \text{ kN (Tension)}$$

Date: \_\_\_\_\_

(4)

$$\uparrow \downarrow \sum F_y = 0$$

$$F_{AC} - 30 = 0$$

$$F_{AC} = 30 \text{ kN (Tension)}$$

JOINT B:

$$\sum F_y = 0$$

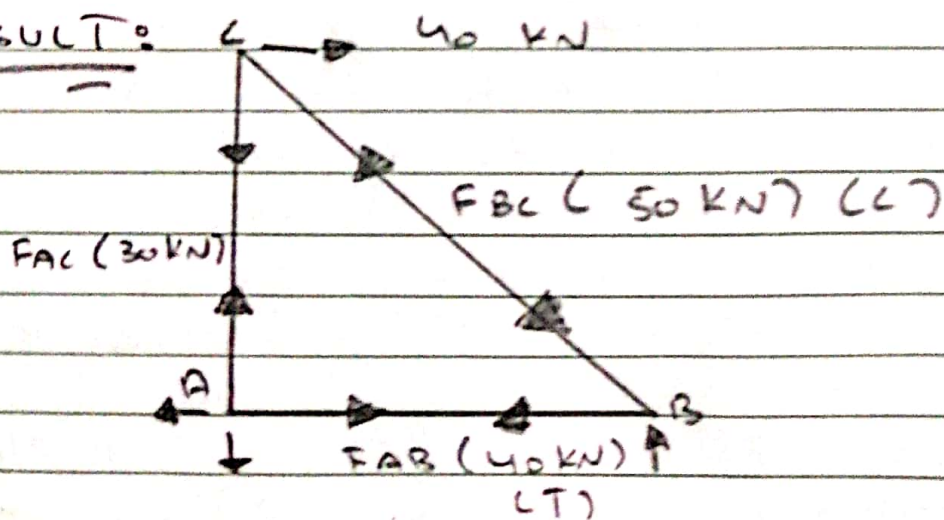
$$30 + F_B \sin 36.87^\circ = 0$$

$$F_{BC} = \frac{-30}{\sin 36.87^\circ}$$

$$F_{BC} = -50 \text{ kN}$$

$F_{BC}$  is COMPRESSIVE FORCE

RESULT:

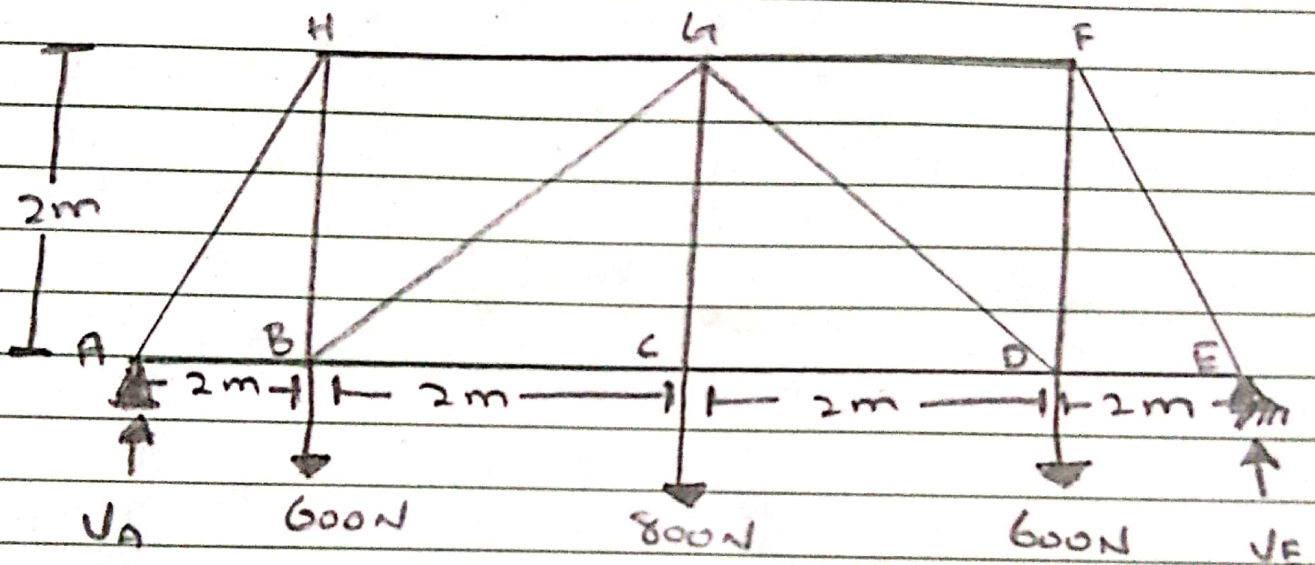


Date: \_\_\_\_\_

(5)

Ans of Qno 2:

DIA GRAM:



SOLUTION:

Due to no external force  
 $H_A$  and  $H_E$  is equal to  
zero.

$V_A$  and  $V_E$ :

$$\uparrow \downarrow \sum F_y = 0$$

$$V_A + V_E - 600 - 800 - 600 = 0$$

$$V_A + V_E = 2000 \text{ N}$$

Date: \_\_\_\_\_

6

$$V_A = V_E$$

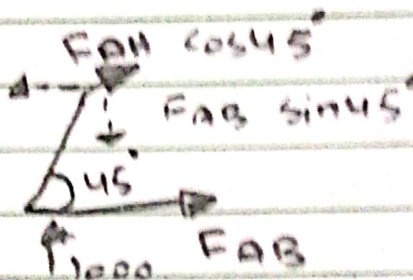
$$2V_A = 2000$$

$$V_A = 1000 \text{ N}$$

$$V_E = 1000 \text{ N}$$

JOINT A:

$$\begin{array}{c} + \quad - \\ \uparrow \quad \downarrow \end{array} \quad \sum F_y = 0$$



$$1000 - F_{AH} \sin 45^\circ = 0$$

$$F_{AH} = \frac{1000}{\sin 45^\circ}$$

$$F_{AH} = 1414.2 \text{ N (compression)}$$

$$\begin{array}{c} \rightarrow \quad \leftarrow \\ \leftarrow \quad \rightarrow \end{array} \quad \sum F_x = 0$$

$$F_{AB} - F_{AH} \cos 45^\circ = 0$$

$$F_{AB} = 1414.21 \times \cos 45^\circ$$

$$F_{AB} = 1000 \text{ N Tension.}$$

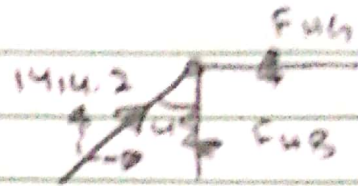
$$F_{AB} = 1000 \text{ N Tension.}$$

Date: \_\_\_\_\_

①

JOINT H:

$$\sum F_x = 0$$



$$-F_{HG} + 1414.2 \sin 45^\circ = 0$$

$$F_{HG} = 1000 \text{ N Compression}$$

$$F_{HG} = 1000 \text{ N Compression.}$$

$$\sum F_y = 0$$

$$F_{HB} - 1414.2 \cos 45^\circ$$

$$F_{HB} = 1000 \text{ N Tension}$$

$$F_{HB} = 1000 \text{ N Tension.}$$

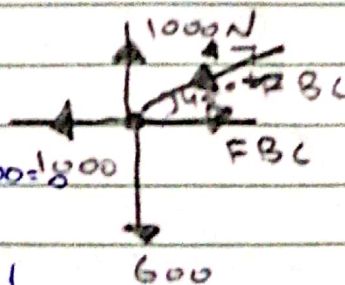
JOINT B:

$$\sum F_y = 0$$

$$-600 - F_{BG} \sin 45^\circ + 1000 = 0$$

$$F_{BG} = 565.7 \text{ N}$$

$$F_{BG} = 565.7 \text{ N (Compression)}$$



Date: \_\_\_\_\_

(8)

$$\sum F_x = 0$$

$$F_{BC} - 1000 - 567.7 \cos 45^\circ = 0$$

$$F_{BC} = 1000 + 4000 = 0$$

$$F_{BC} = 1400 \text{ Tension.}$$

$$F_{BC} = 1400 \text{ Tension.}$$

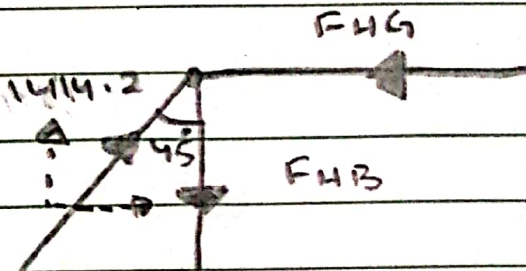
$$\sum F_y$$

$$F_{CG} = 800 \text{ Tension.}$$

$$F_{CG} = 800 \text{ Tension.}$$

JOINT H:

$$\sum F_x = 0$$



$$-F_{HG} + 1414.2 \sin 45^\circ = 0$$

$$F_{HG} = 1000 \text{ N Compression.}$$

$$F_{HG} = 1000 \text{ N Compression.}$$



Date: .....

④

$$\uparrow \downarrow \sum F_y = 0$$

$$F_{HB} = 1414.2 \cos 45^\circ$$

$$F_{HB} = 1000 \text{ N (Tension)}$$

$$F_{HB} = 1000 \text{ N (Tension)}$$

