

# 大同大學 101 學年度轉學入學考試試題

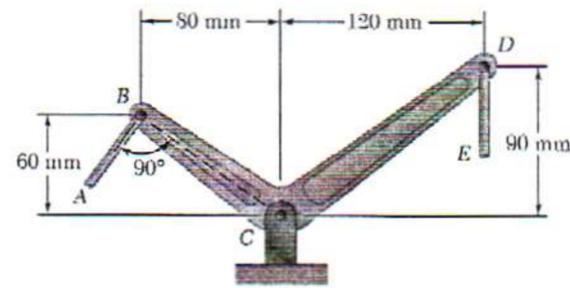
考試科目：工程力學

所別：機械工程學系

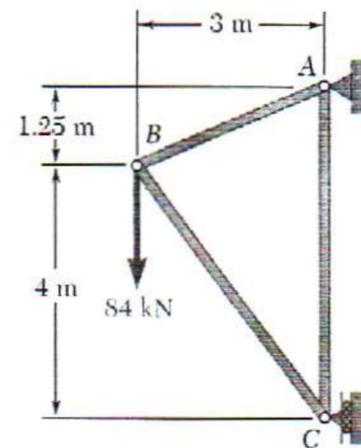
第 1/1 頁

註：本次考試 不可以參考自己的書籍及筆記； 不可以使用字典； 可以使用計算器

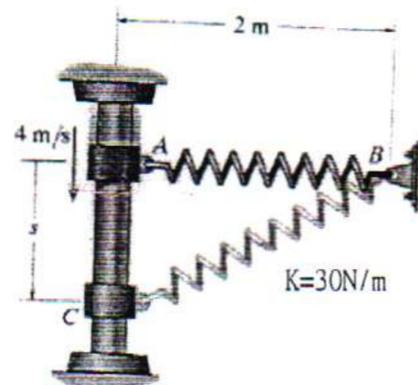
- (1) Two links AB and DE are connected by a bell crank as shown. Knowing that the tension in link AB is 720N, determine (a) the tension in link DE, (b) the reaction at C.



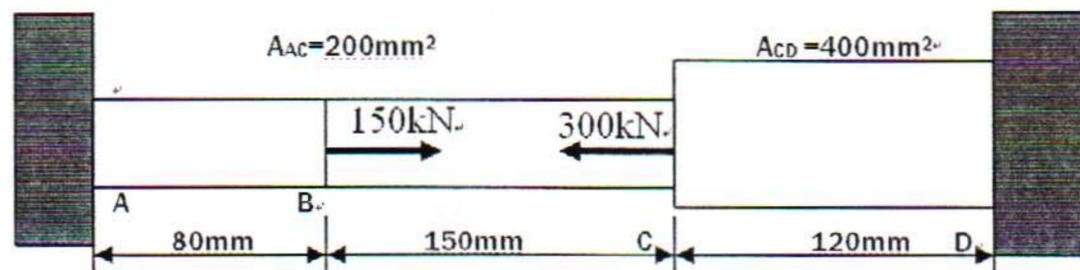
- (2) Using the method of joints, determine the force in each member of the truss shown. State whether each member is in tension or compression.



- (3) The 2-kg collar is given a downward velocity of 4m/s when it is at A. If the spring has unstretched length of 1m and a stiffness of  $k=30\text{N/m}$ , determine the velocity of the collar at  $s=1\text{m}$ .



- (4) A step rod is made up of two uniform members as shown in the figure. The rod exactly fits between rigid walls and the ends of the rod are welds to the rigid walls. (a) Determine the reactions  $R_A$  and  $R_D$  at the fixed ends. (b) Determine the displacement at point C (c) Determine the maximum stress of rod AD. Assume  $E_{AC}=200\text{GPa}$  for member AC and  $E_{CD}=80\text{GPa}$  for member CD.



- (5) The simple supported beam is made of material that has an allowable tensile stress of  $(\sigma_{\text{allow}})_T=120\text{MPa}$ , an allowable compressive stress of  $(\sigma_{\text{allow}})_C=160\text{MPa}$ . Determine the dimension of structure if it is to be rectangular and have a height-to-width ratio of  $h/b=2.0$ .

