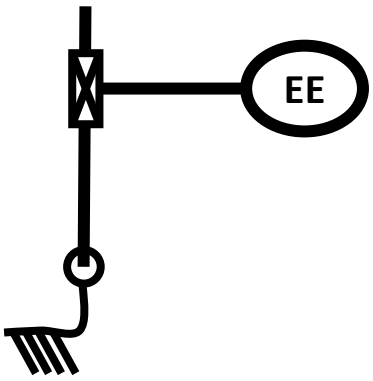
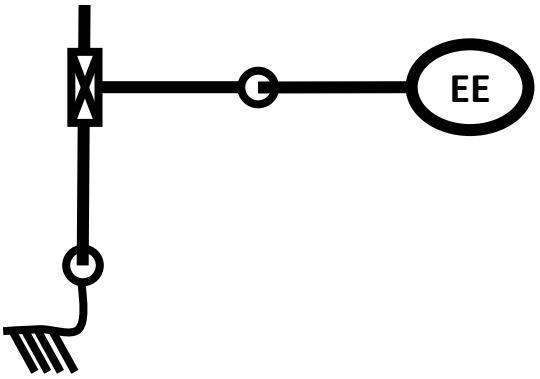
1 to 13: answer the following questions providing a short explanation: [A] total degree of freedom; [B] degree of freedom of the EE body; [C] structural constraint; [D] if a parallel mechanism, choose a good actuation and find the actuated constraint.
1 and 6: write the geometric Jacobian using symbols for the joint twists (no need to project in a ref frame)
Write your answers in the blank space available aside from the drawings and separate the answers to different problems by drawing lines between them so that you can use all the space available
Write your name and ID number at least in the first page of the exam

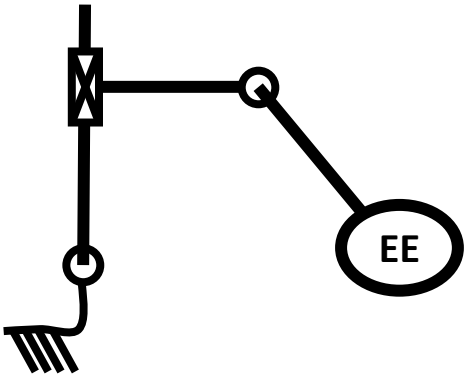
**1**




**2**

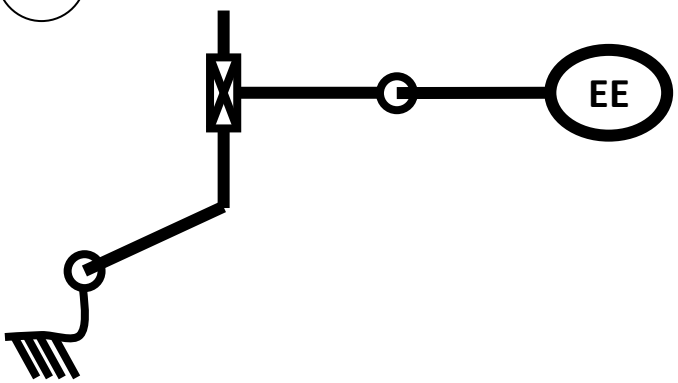



**3**

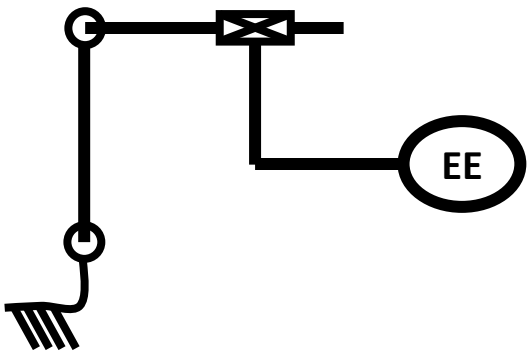



STUDENT NAME ..
STUDENT ID NUMBER ..

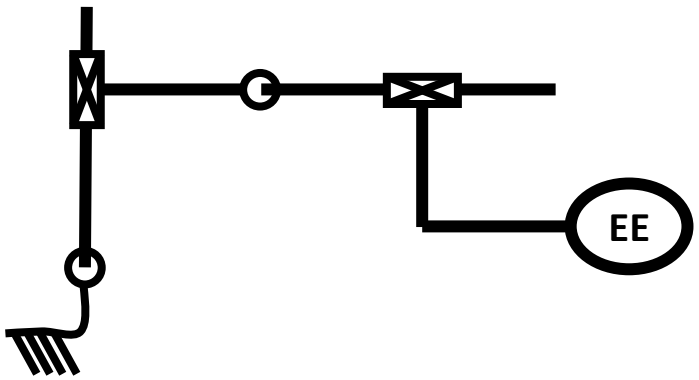
4




5

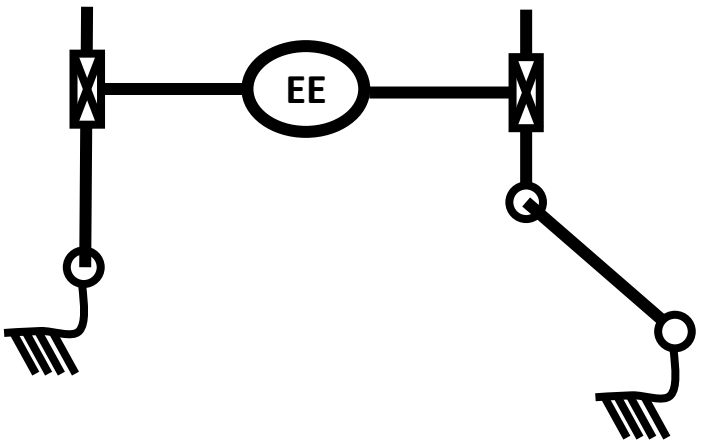



6

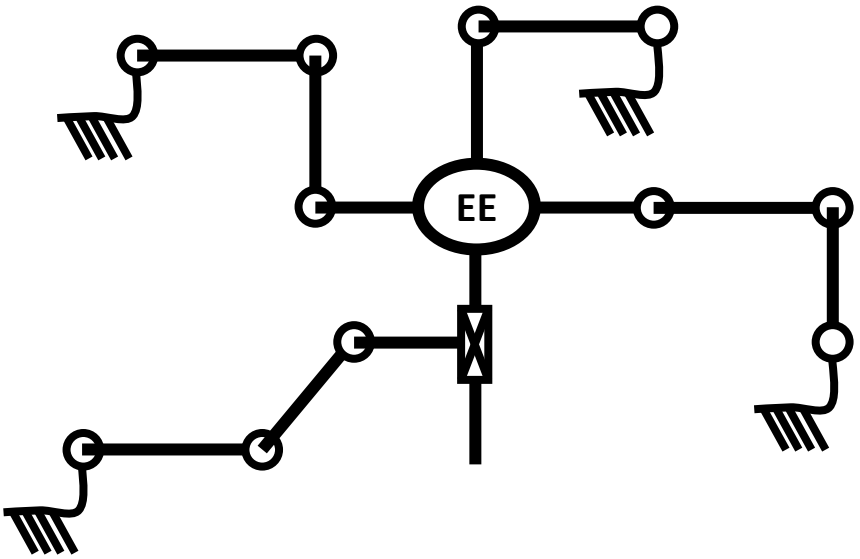



STUDENT NAME ..
STUDENT ID NUMBER ..

**7**

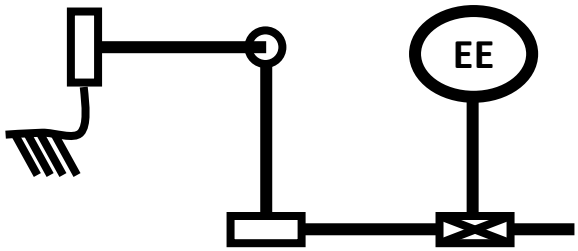



**8**

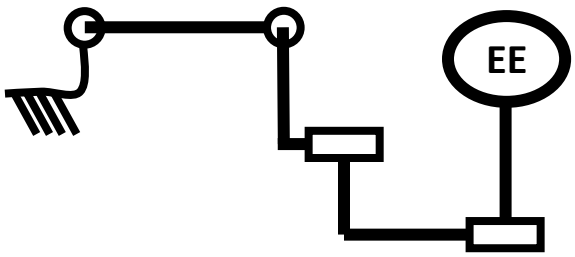



STUDENT NAME ..
STUDENT ID NUMBER ..

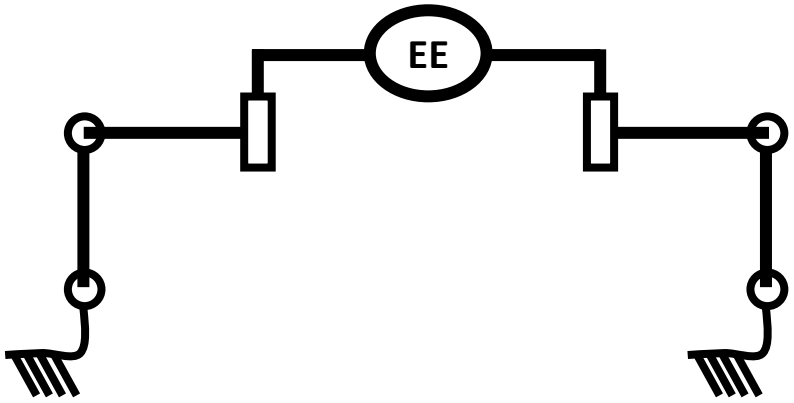
**9**




**10**

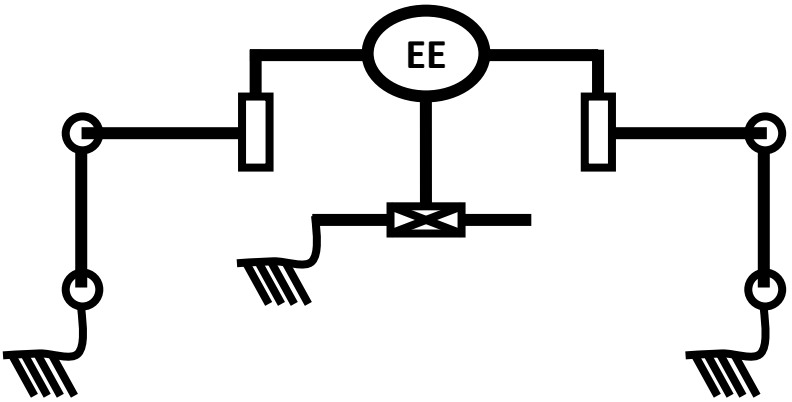



**11**

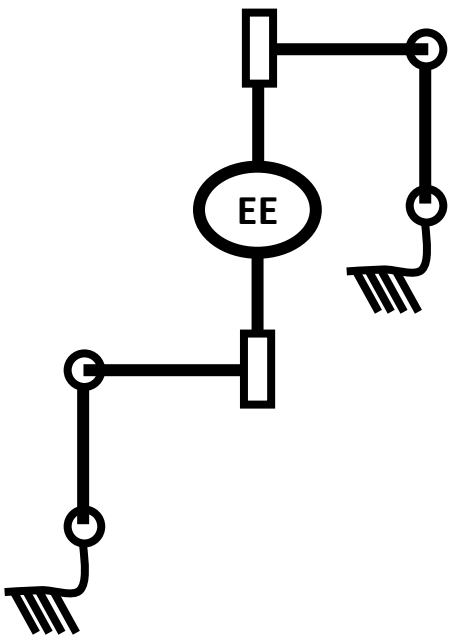



STUDENT NAME ..
STUDENT ID NUMBER ..

**12**

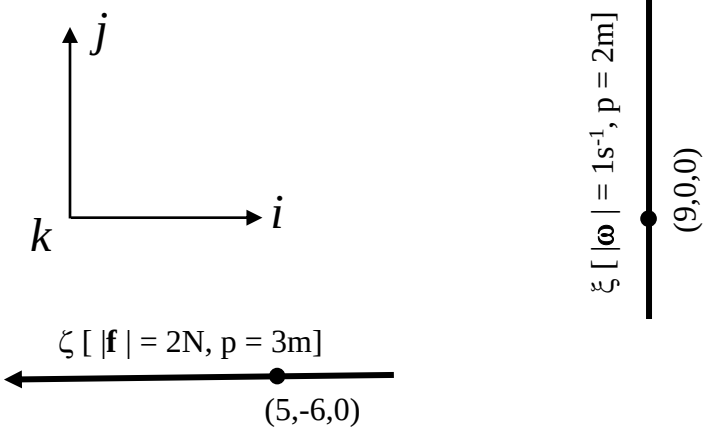



**13**




STUDENT NAME ..
STUDENT ID NUMBER ..

**14** Project $\xi$ and $\zeta$ in the reference frame given




STUDENT NAME ..
STUDENT ID NUMBER ..