

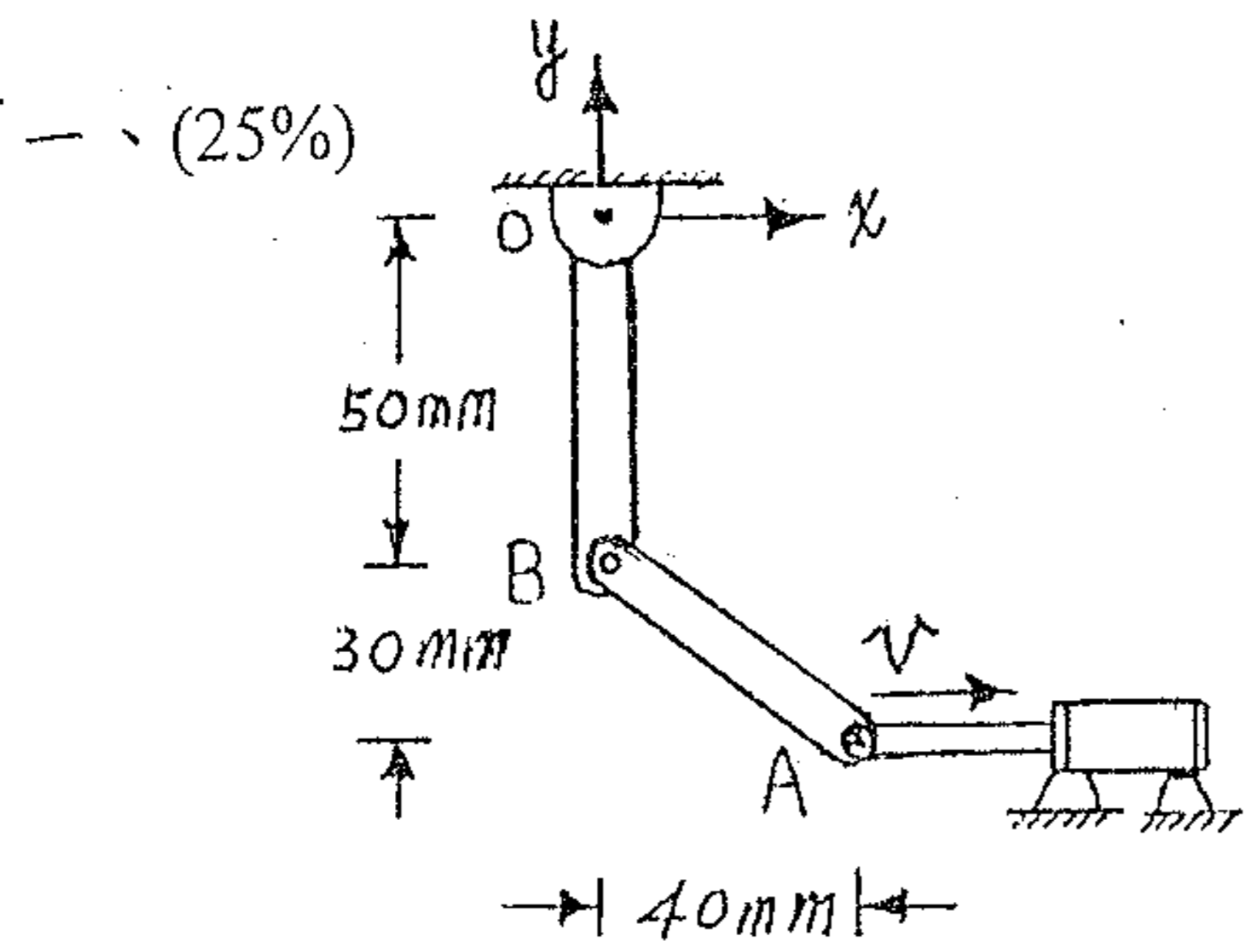
淡江大學八十八學年度碩士班招生考試試題

系別：機械工程學系

科目：動力學

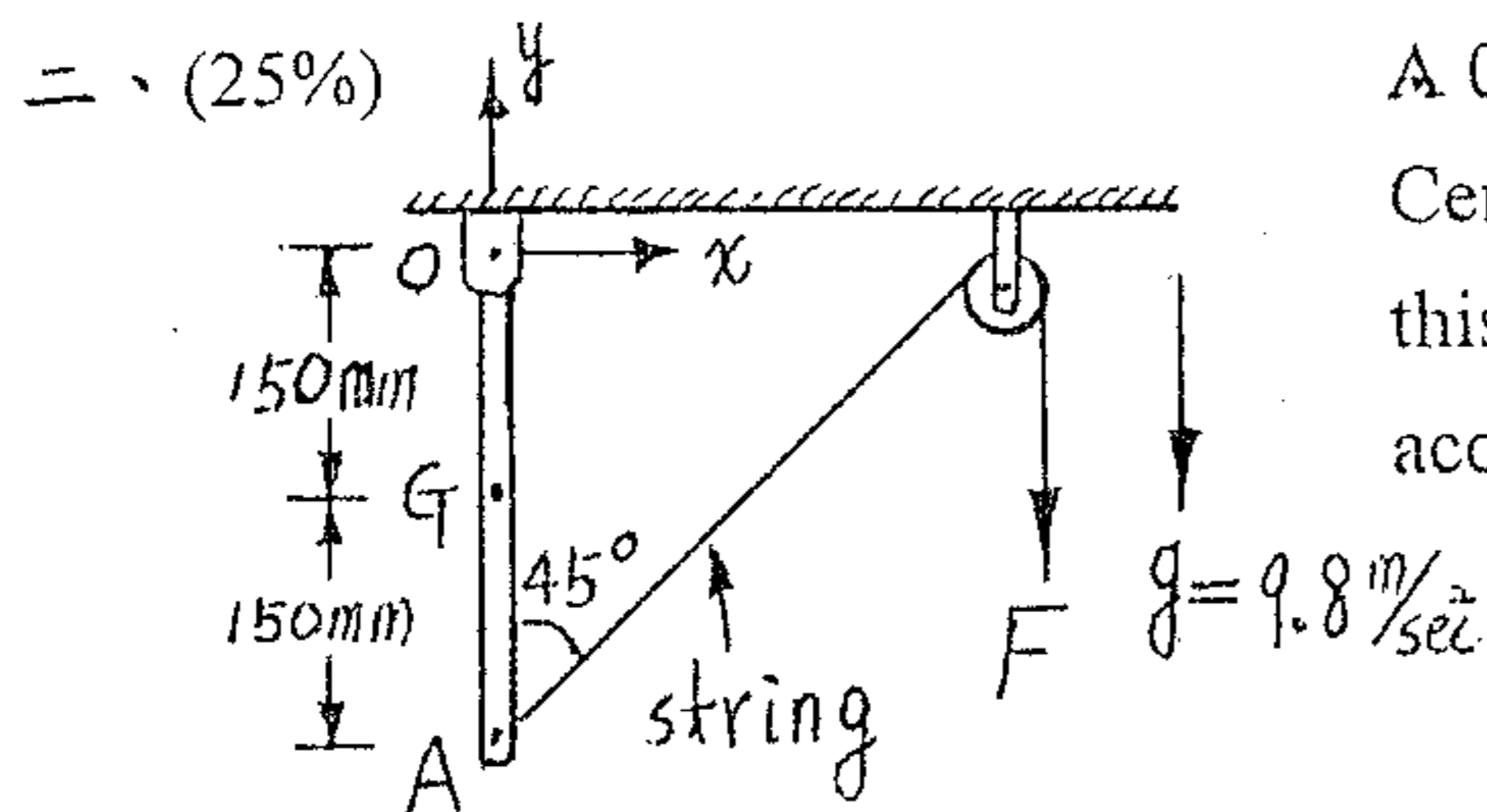
本試題共 / 頁

注意事項：這份試卷一共有五題，請任意選擇四題作答，若回答五題，將只計算你所作答的前四題分數。

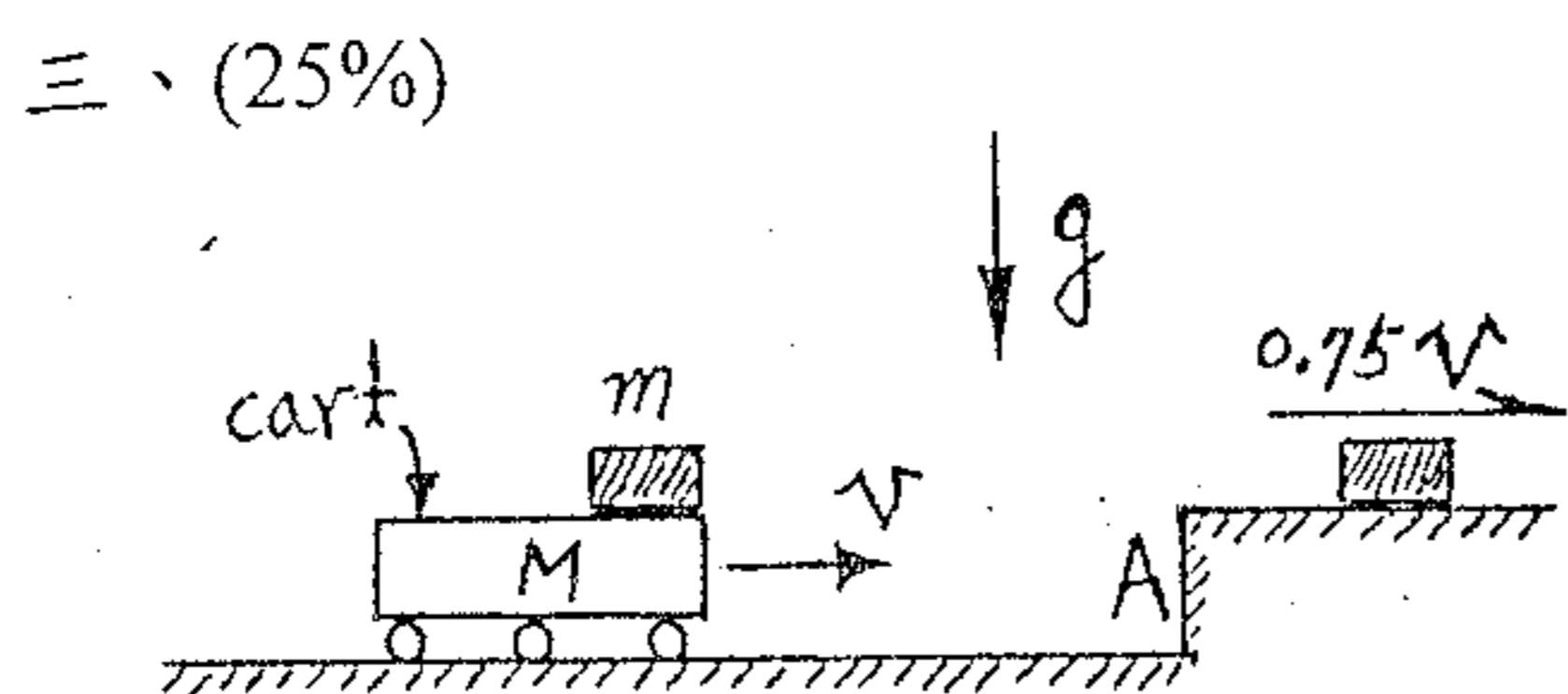
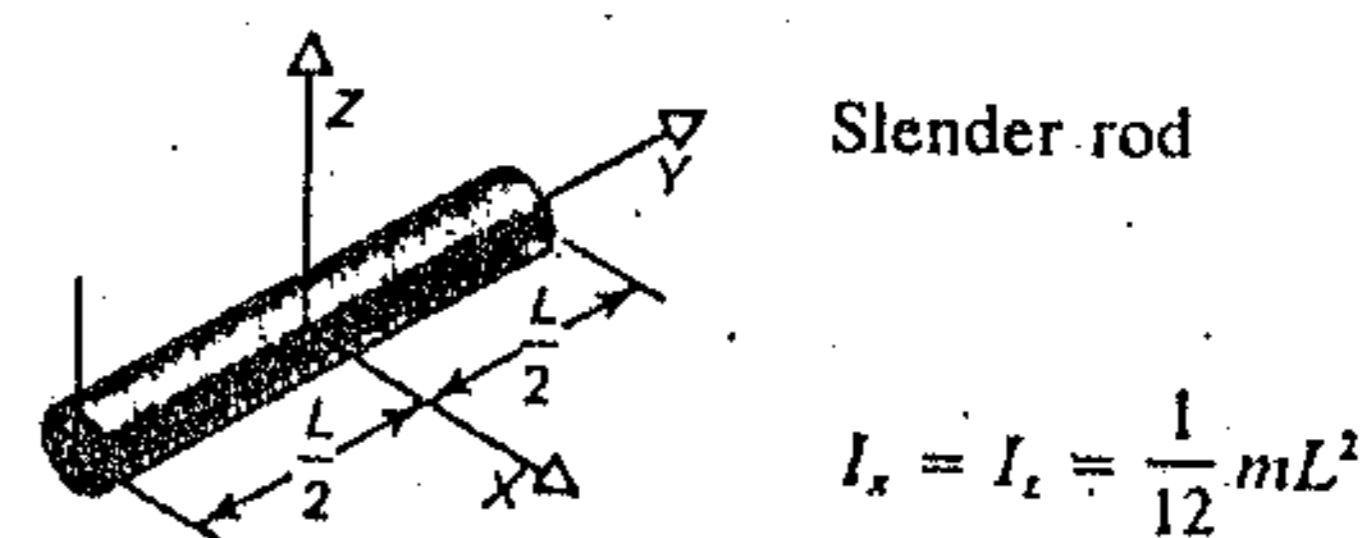


The piston of the hydraulic cylinder gives pin A a constant velocity $v=200$ mm/sec at this moment.

- 1). Locate instantaneous centers of zero velocity of link AB and link BO.
- 2). Determine \vec{v}_B , velocity of the pin B, and angular velocities $\vec{\omega}_{AB}$, $\vec{\omega}_{BO}$ by using instantaneous centers of zero velocity.
- 3). Determine $\vec{\alpha}_{AB}$ and $\vec{\alpha}_{BO}$, angular accelerations of link AB and link BO.

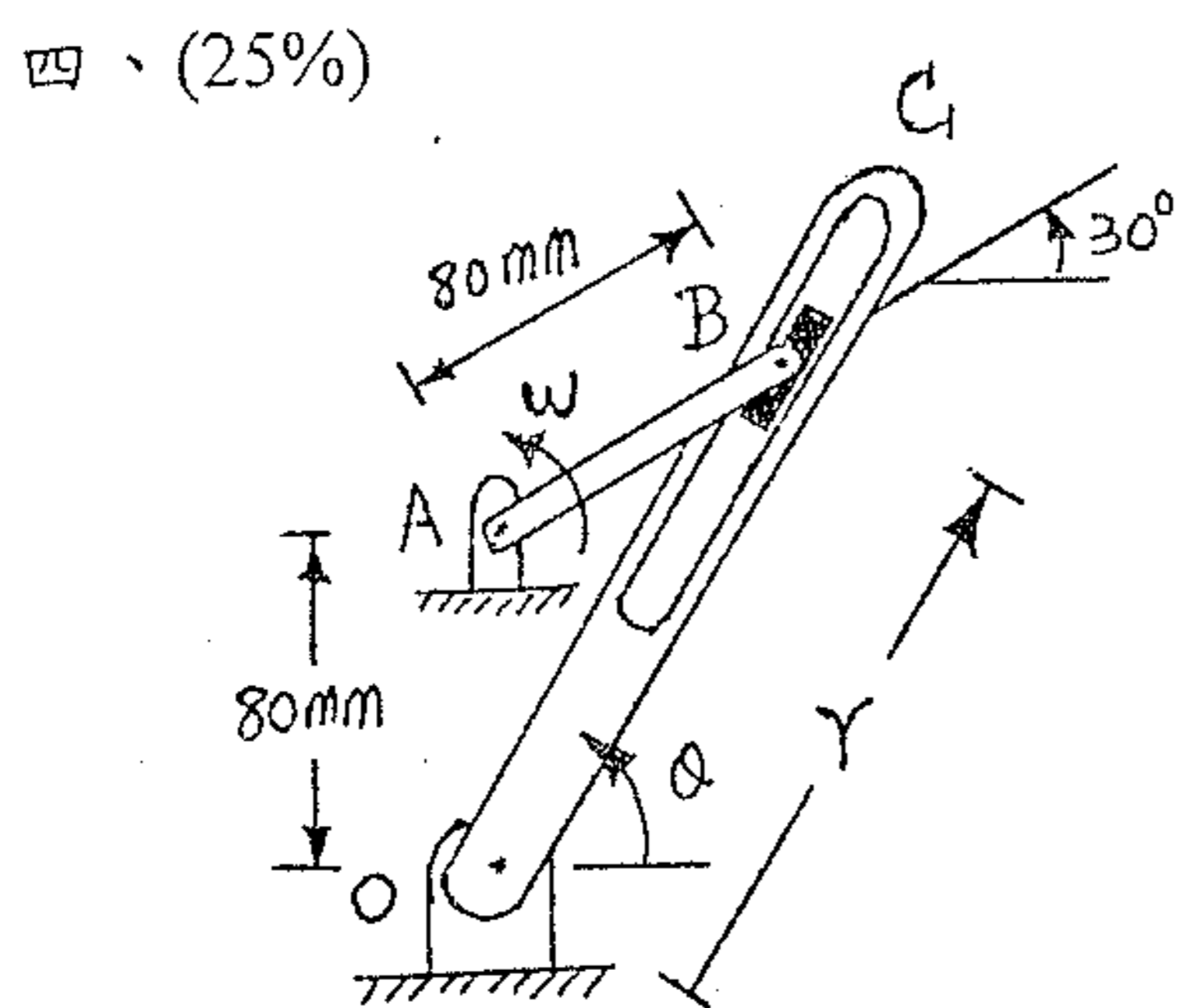


A 0.4kg slender rod, originally at rest, is pulled by a force $F=0.8$ Nt. Center of mass of this rod is at G. Draw free body diagram of this rod and determine reaction forces at O, and angular acceleration $\vec{\alpha}$ at this moment.



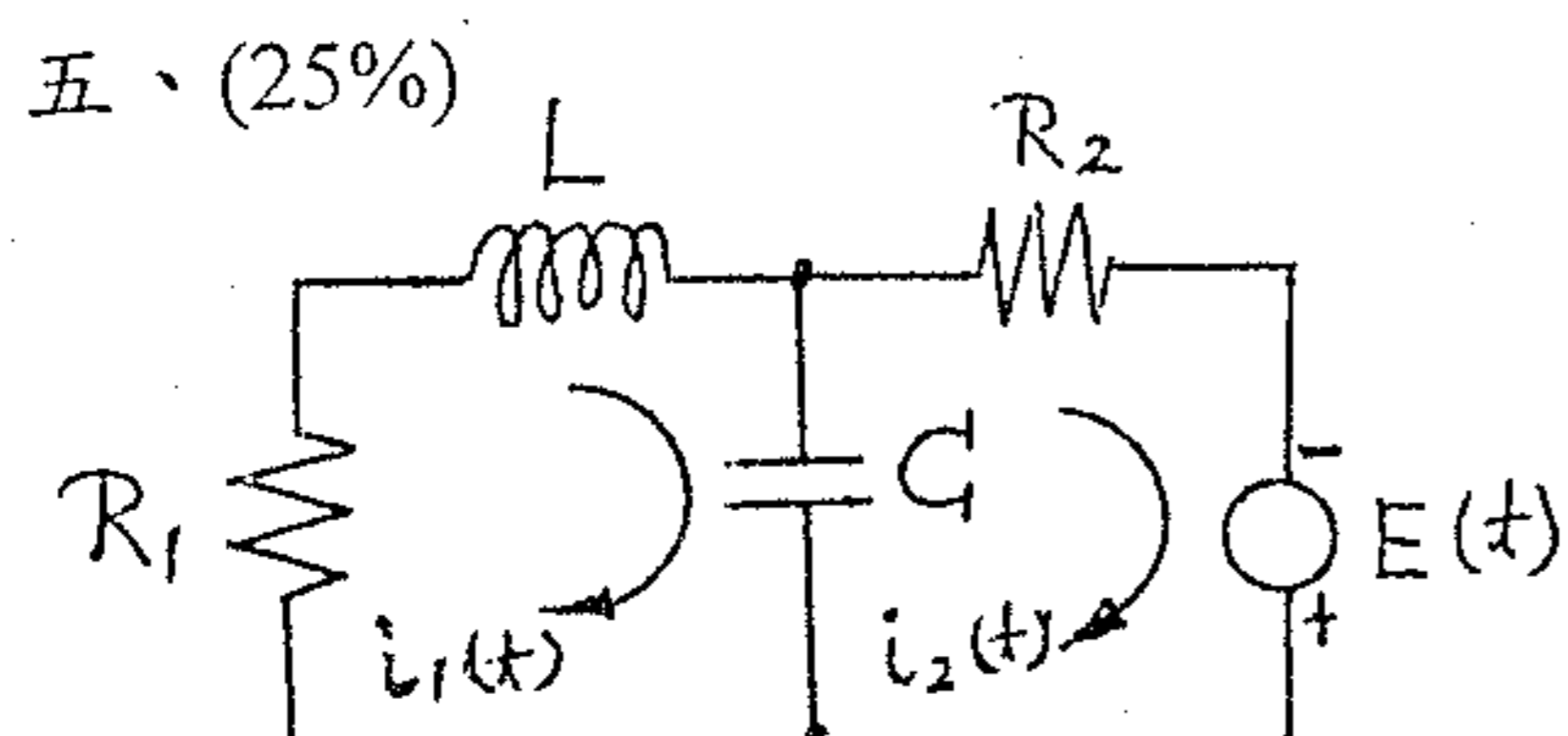
A block of mass m moves together with a cart of mass M with a speed v . After striking with an obstacle at A, the cart stays at A and the block moves further with the speed $0.75v$.

- 1). If the duration time of impact is Δt , determine the average impact force F .
- 2). Estimate the coefficient of kinetic friction between the block and the cart.



At the position shown in the figure, link AB rotates with a counterclockwise angular velocity $\omega = 5$ rad/sec.

- 1). Determine velocity of the slider B in the polar (r, θ) coordinates.
- 2). Determine angular velocity of link OC at this instant.



Using electrical charges as variables, obtain equation(s) of motion for the circuit shown in the figure.

$E(t)$ is the voltage source, $i_1(t)$ and $i_2(t)$ are currents, R_1 and R_2 are resistors, L and C represent inductor and capacitor respectively