		類組代碼	D37
科目名稱	動力學	科目碼	D3794

※本項考試依簡章規定所有考科均「不可」使用計算機。　　　**本科試題共計　2　頁**

Problem 1. As shown in the figure, the uniform slender rod with mass m and length L is held in the equilibrium position by hinge A and cord BC. Determine the angular velocity of the rod AB immediately after BC is cut. (每題 20 分，答錯倒扣 15 分)

(A) $3g/2L$ (B) $g/2L$ (C) $2gL$ (D) $3gL$ (E) $3g/L$

Problem 2 Continuing from Problem 1, please also determine the magnitude of the reaction force at hinge A immediately after BC is cut. (每題 20 分，答錯倒扣 15 分)

(A) $mg/4$ (B) $mg/3$ (C) $mg/2$ (D) mg (E) $2mg$

Problem 3 As shown in the figure, a cylinder with a radius r moves on a moving flat plate. The plate has an instantaneous velocity v_1 and is accelerating to the right with a_1. The angular velocity of the cylinder is ω and its angular acceleration is α. The contact point A does not slip. Determine the velocity V_0 of the cylinder's center. (每題 15 分，答錯倒扣 10 分)

(A) $V_1(\rightarrow)$ (B) $V_1 - r\omega(\rightarrow)$ (C) $V_1 + r\omega(\rightarrow)$ (D) $V_1(\leftarrow)$ (E) $V_1 - r\alpha(\rightarrow)$
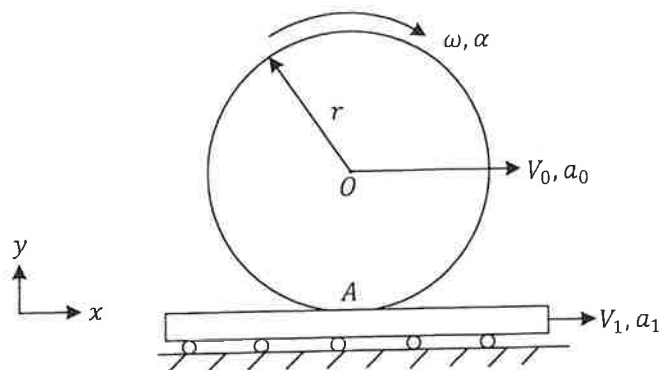
Problem 4 Continuing from Problem 3, please also determine the acceleration a_0 of the cylinder's center.

(A) $a_1(\rightarrow)$ (B) $a_1(\leftarrow)$ (C) $a_1 - r\omega^2 + r\alpha(\rightarrow)$ (D) $a_1 + r\alpha(\rightarrow)$ (E) $a_1 - r\alpha(\rightarrow)$

(每題 15 分，答錯倒扣 10 分)

Problem 5 Continuing from Problem 3, please also determine the velocity V_A at the bottom of the cylinder.

(A) $V_1(\leftarrow)$ (B) $V_1(\rightarrow)$ (C) 0 (D) $V_1 + r\alpha(\rightarrow)$ (E) $V_1 + r\omega(\rightarrow)$ （每題 15 分，答錯倒扣 10 分）

Problem 6 Continuing from Problem 3, please also determine the acceleration a_A at the bottom of the cylinder. (A) $a_1\vec{\imath} + r\omega^2\vec{\jmath}$ (B) $a_1\vec{\imath} - r\omega^2\vec{\jmath}$ (C) $-a_1\vec{\imath} + r\omega^2\vec{\jmath}$ (D) $-a_1\vec{\imath} - r\omega^2\vec{\jmath}$ (E) $r\omega^2\vec{\jmath}$

（每題 15 分，答錯倒扣 10 分）