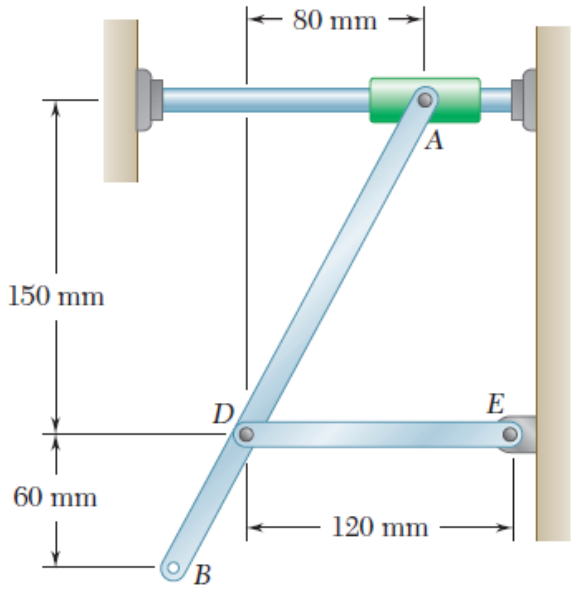
YILDIZ TECHNICAL UNIVERSITY **FACULTY OF CIV. ENG. - DIV. OF CIV. ENG.** **MECHANICS DIVISION**		**2018-2019 FALL** **DYNAMICS** **HOMEWORK 2**

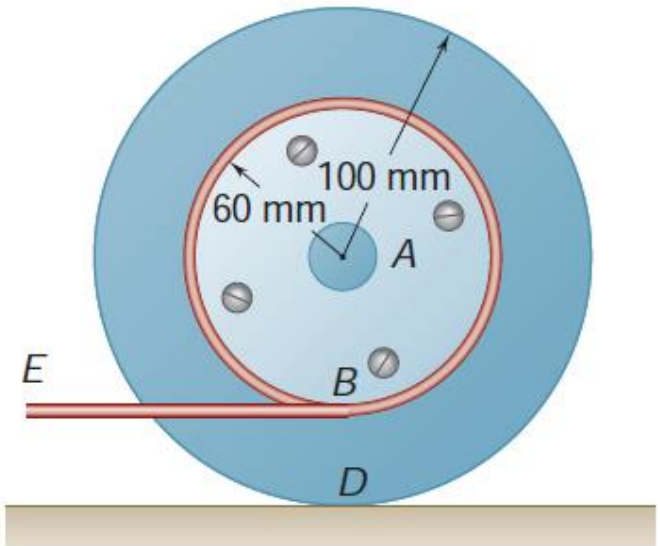
NAME:	**NO:**	**GROUP:**

NOTE: Any homework submitted after the deadline will be void.

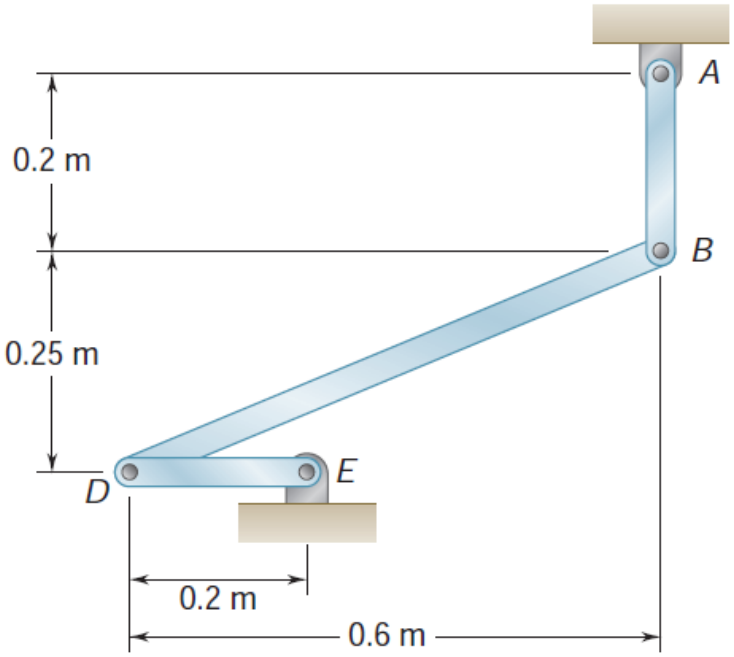
1) Knowing that at the instant shown the angular velocity of rod *DE* is 2.4 rad/s clockwise, determine **(*a*)** the velocity of collar *A*, **(*b*)** the velocity of point *B*. **(Answer: $v_A = 540\ mm/s$, $v_B = 457\ mm/s$)**



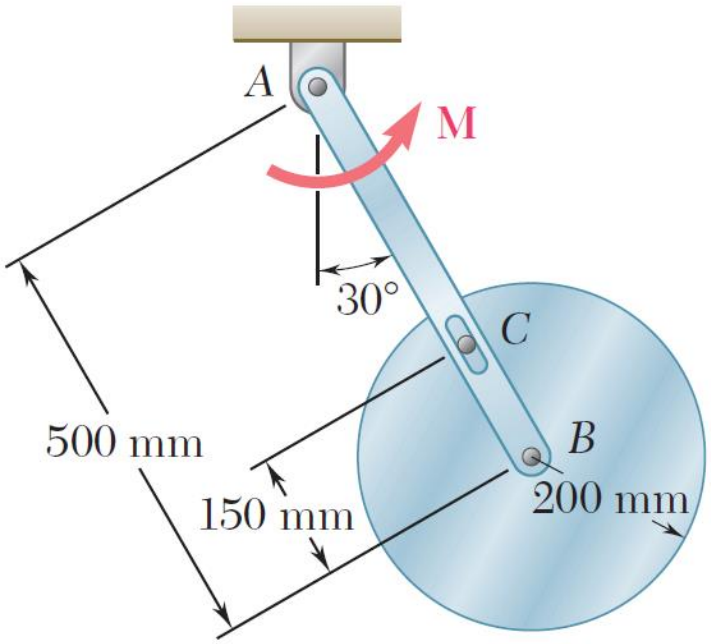
2) A 60-mm-radius drum is rigidly attached to a 100-mm-radius drum as shown. One of the drums rolls without sliding on the surface shown, and a cord is wound around the other drum. Knowing that end *E* of the cord is pulled to the left with a velocity of 120 mm/s, determine **(*a*)** the angular velocity of the drums, **(*b*)** the velocity of the center of the drums, **(*c*)** the length of cord wound or unwound per second. **(Answer: $\omega = 3 rad/s$, $v_A = 300\ mm/s$, $180\ mm$)**



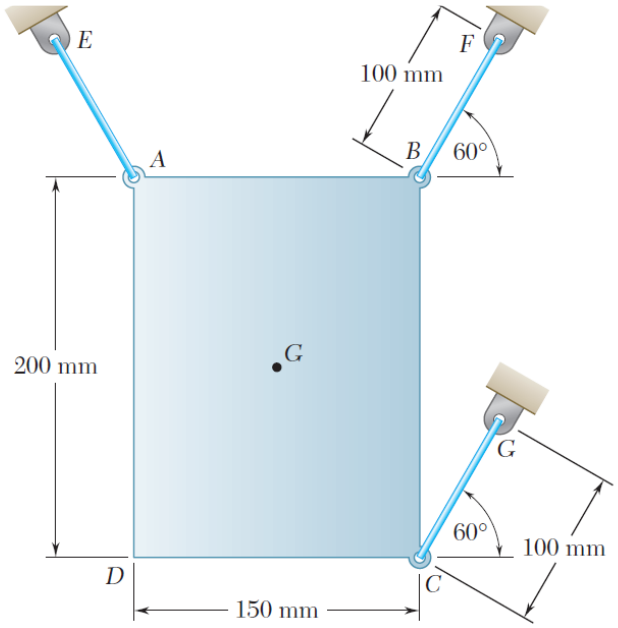
3) Knowing that at the instant shown bar *AB* has an angular velocity of 10 rad/s clockwise and it is slowing down at a rate of 2 rad/s^2, determine the angular accelerations of bar *BD* and bar *DE*. **(Answer: $\alpha_{BD} = 306\ rad/s^2,\ \alpha_{DE} = 737\ rad/s^2$)**



4) A 9-kg uniform disk is attached to the 5-kg slender rod *AB* by means of frictionless pins at *B* and *C*. The assembly rotates in a vertical plane under the combined effect of gravity and of a couple **M** which is applied to rod *AB*. Knowing that at the instant shown the assembly has an angular velocity of 6 rad/s and an angular acceleration of 25 rad/s^2, both counterclockwise, determine **(*a*)** the couple **M**, **(*b*)** the force exerted by pin *C* on member *AB*. **(Answer: $M = 99.4\ Nm, T_C = 30\ N$)**



5) A uniform thin plate *ABCD* has a mass of 8 kg and is held in position by three inextensible cords *AE*, *BF*, and *CG*. If cord *AE* is cut, determine at that instant (*a*) if the plate is undergoing translation or general plane motion, (*b*) the tension in cords *BF* and *CG*. **(Answer: $T_{BF} = 65.2\ N, T_{CG} = 0$)**



HOMEWORK HOURS

Assoc. Prof. Zafer KÜTÜĞ (GROUP: 2) 25.12.2018 10:30 – 14:30
Assoc. Prof. Murat ALTEKİN (GROUP: 3)25.12.2018 10:30 – 14:30
⇒ Res. Assist. Yurdakul AYGÖRMEZ
Room: 2 – 030

Assist. Prof. Çağrı MOLLAMAHMUTOĞLU (GROUP: 1) 26.12.2018 10:30 – 14:30
Assist. Prof. Yıldırım Serhat ERDOĞAN (GROUP: 4) 26.12.2018 10:30 – 14:30
⇒ Res. Assist. Yurdakul AYGÖRMEZ
Room: 2 – 030

NOTE: Homeworks will be delivered by hand.