

### Challenge Questions: Online Edition 1

**CQ 1.** Your instructors have decided to teach Robotics at a local high school beginning this fall. They need your help determining how to arrange their class schedule.

They will be teaching seven different groups of students (student groups A, B, C, D, E, F, and G) during seven consecutive periods (numbered back-to-back, 1 through 7). Only one student group (A through G) can be scheduled per period (1 through 7). The schedule must adhere to all of the following constraints:

1. Student groups **A** and **C** must be in Robotics one right after the other (consecutive periods)
2. **A** must be scheduled for an earlier period than **G**
3. **C** must be scheduled for a later period than **E**.
4. If E does not occupy the fourth period, then D must occupy the fourth period.
5. **F** and **G** cannot occupy back-to-back periods.

(a) Which of the following could be a possible list of sessions, in the order that they are scheduled during the day?

- (A) ACDEFBG
- (B) BFAECGD
- (C) EACDFBG
- (D) ECADGFB
- (E) EFCADGB

(b) If session A is assigned to the third period, then which of the following must be true?

- (A) B is assigned to the 6th period
- (B) C is assigned to the 1st period
- (C) E is assigned to the 4th period
- (D) F is assigned to the 5th period
- (E) G is assigned to the 7th period

(c) Which of the following could be true?

- (A) A is assigned to the 1st period
- (B) C is assigned to the 5th period
- (C) E is assigned to the 7th period
- (D) F is assigned to the 6th period
- (E) G is assigned to the 3rd period

(d) If B is assigned to third period, then each of the following could be true EXCEPT:

- (A) A is assigned to the 5th period
- (B) C is assigned to the 6th period
- (C) D is assigned to the 4th period
- (D) F is assigned to the 1st period
- (E) G is assigned to the 6th period

(e) If F is assigned to the seventh period, then which of the following must be assigned to the fifth period?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) G