

# Introduction to Biostatistics (Stats 8)

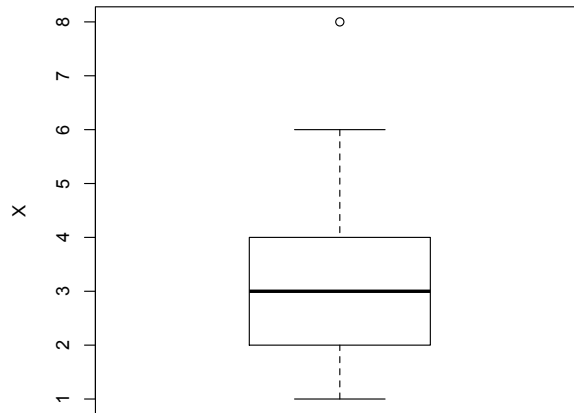
## Midterm Exam

**Duration: 9:00 to 9:50 AM**

Name:

Student ID:

1. Using the following figure write down the five-number summary, range, and *IQR* for  $X$ . (20 points)



2. We want to investigate the relationship between gender and smoking among college students. We obtain a random sample of 220 students, of which 120 are female. In our sample, 30 women and 30 men are smokers. (30 points)
  - (a) Comment on the type of study we have conducted and identify the response and explanatory variables.
  - (b) Write down the corresponding contingency table and comment on the relationship between gender and smoking based on the sample odds ratio.
3. The sample mean and coefficient of variation (CV) for the variable  $X$  are 10 and 0.5 respectively. We create a new variable,  $Y$ , by multiplying  $X$  by 2 and adding 5 to the result. What are the standard deviation and CV of  $Y$ ? (30 points)
4. The events  $E_1$  and  $E_2$  are disjoint. We know  $P(E_1) = 0.4$  and  $P(E_2) = 0.5$ . Do these events partition the sample space? why? (10 points)
5. For two events  $E_1$  and  $E_2$ , we have  $P(E_1) = 0.2$ ,  $P(E_2) = 0.3$ , and  $P(E_1 \cup E_2) = 0.4$ . What is  $P((E_1 \cap E_2)^c)$ ? (10 points)