1A

STATISTICS

SECTION II

Part A

Questions 1-5

Spend about 65 minutes on this part of the exam.

Percent of Section II grade—75

Directions: Show all your work. Indicate clearly the methods you use, because you will be graded on the correctness of your methods as well as on the accuracy of your results and explanation.

1. The goal of a nutritional study was to compare the caloric intake of adolescents living in rural areas of the United States with the caloric intake of adolescents living in urban areas of the United States. A random sample of ninth-grade students from one high school in a rural area was selected. Another random sample of ninth graders from one high school in an urban area was also selected. Each student in each sample kept records of all the food he or she consumed in one day.

   The back-to-back stemplot below displays the number of calories of food consumed per kilogram of body weight for each student on that day.

Urban		Rural
99998876	2	
44310	3	2334
97665	3	56667
20	4	02224
	4	56889
	5	1

Stem: tens
Leaf: ones

(a) Write a few sentences comparing the distribution of the daily caloric intake of ninth-grade students in the rural high school with the distribution of the daily caloric intake of ninth-grade students in the urban high school.

The distribution of the daily caloric intake of ninth-grade students in the rural high school is approximately symmetric while the distribution of the daily caloric intake of ninth-grade students in the urban high school is skewed right. Neither distributions have an outlier. The median (22) of the urban distribution and its Q_1 (21) and Q_3 (30) are all less than that of the rural distribution. The rural distribution has a spread of 19 larger than the urban distribution spread of 16. The IQR of the urban distribution is 5 which is less than the IQR of the Rural distribution which is 10.

which has a median of 41 Q_1 equal to 35.5 and Q_3 equal to 45.

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(b) Is it reasonable to generalize the findings of this study to all rural and urban ninth-grade students in the United States? Explain.

No, there are many different rural and urban areas in the united states, this sample only encompases students from two schools. There are many more students who don't go to highschool, or many schools may even administer healthier lunches. There are just too many confounding or lurking variables to generalize the findings of this study to ALL rural and urban ninth-grade students in the United States.

(c) Researchers who want to conduct a similar study are debating which of the following two plans to use.

Plan I: Have each student in the study record all the food he or she consumed in one day. Then researchers would compute the number of calories of food consumed per kilogram of body weight for each student for that day.

Plan II: Have each student in the study record all the food he or she consumed over the same 7-day period. Then researchers would compute the average daily number of calories of food consumed per kilogram of body weight for each student during that 7-day period.

Assuming that the students keep accurate records, which plan, I or II, would better meet the goal of the study? Justify your answer.

Plan II would be better because it encompasses a 7-day period which would average out any days that a student might have eaten an extremely large amount or a very small amount. In plan I the amount of food is only during one day, and in that one day there might be variables which would cause that person to eat more or less then they normally would.

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1B

STATISTICS
SECTION II
Part A
Questions 1-5

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1. The goal of a nutritional study was to compare the caloric intake of adolescents living in rural areas of the United States with the caloric intake of adolescents living in urban areas of the United States. A random sample of ninth-grade students from one high school in a rural area was selected. Another random sample of ninth graders from one high school in an urban area was also selected. Each student in each sample kept records of all the food he or she consumed in one day.

   The back-to-back stemplot below displays the number of calories of food consumed per kilogram of body weight for each student on that day.

Urban		Rural
99998876	2	
44310	3	2334
97665	3	56667
20	4	02224
median 34	4	56889
n= 20 mean 32.6	5	1

median 41
mean : 40.45
n=20

Stem: tens
Leaf: ones

30 pts

(a) Write a few sentences comparing the distribution of the daily caloric intake of ninth-grade students in the rural high school with the distribution of the daily caloric intake of ninth-grade students in the urban high school.

the Urban sample distribution has a center of approximately 33 and is skewed towards lower caloric intakes a spread of 26 to 42 with no outliers
the rural sample distribution is roughly symmetrical arround a center of 41 cal per kg of body weight
a spread of 32 to 51 with no outliers

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(b) Is it reasonable to generalize the findings of this study to all rural and urban ninth-grade students in the United States? Explain.

It is not reasonable to generalize these findings to all rural and urban 9th grade students because the sample size is so small, and only includes two schools

these two schools could have very different meal plans provided during the school day than the average plans of highschools in the nation

Only using two schools leaves room for confounding variables

(c) Researchers who want to conduct a similar study are debating which of the following two plans to use.

Plan I: Have each student in the study record all the food he or she consumed in one day. Then researchers would compute the number of calories of food consumed per kilogram of body weight for each student for that day.

Plan II: Have each student in the study record all the food he or she consumed over the same 7-day period. Then researchers would compute the average daily number of calories of food consumed per kilogram of body weight for each student during that 7-day period.

Assuming that the students keep accurate records, which plan, I or II, would better meet the goal of the study? Justify your answer.

plan II, it would give a more realistic view of the students daily caloric intake by averaging over a seven day period. this would help reduce the impact of unusually high or low days (such as a party or a day in which a meal was missed) these averages would more realistically represent each student

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1C

STATISTICS
SECTION II
Part A
Questions 1-5

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Directions: Show all your work. Indicate clearly the methods you use, because you will be graded on the correctness of your methods as well as on the accuracy of your results and explanation.

1. The goal of a nutritional study was to compare the caloric intake of adolescents living in rural areas of the United States with the caloric intake of adolescents living in urban areas of the United States. A random sample of ninth-grade students from one high school in a rural area was selected. Another random sample of ninth graders from one high school in an urban area was also selected. Each student in each sample kept records of all the food he or she consumed in one day.

   The back-to-back stemplot below displays the number of calories of food consumed per kilogram of body weight for each student on that day.

Urban		Rural
9 9 9 9 8 8 7 6	2	
4 4 3 1 0	3	2 3 3 4
9 7 6 6 5	3	5 6 6 6 7
2 0	4	0 2 2 2 4
	4	5 6 8 8 9
	5	1

42

Stem: tens
Leaf: ones

   (a) Write a few sentences comparing the distribution of the daily caloric intake of ninth-grade students in the rural high school with the distribution of the daily caloric intake of ninth-grade students in the urban high school.

Students in rural high school has higher median and range. Compared to students in urban high school. Almost half of the data for urban school is in 20's, but the data of rural is well distributed. Shape of the distribution for urban is skewed to the right, and shape of the distribution for rural is nearly symmetric. There is no gap in either school.

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1C

(b) Is it reasonable to generalize the findings of this study to all rural and urban ninth-grade students in the United States? Explain.

It is not reasonable to generalize the findings of this study because the sample size is small, and there could be some confounding variables that controls the calories of students in each area.

(c) Researchers who want to conduct a similar study are debating which of the following two plans to use.

Plan I: Have each student in the study record all the food he or she consumed in one day. Then researchers would compute the number of calories of food consumed per kilogram of body weight for each student for that day.

Plan II: Have each student in the study record all the food he or she consumed over the same 7-day period. Then researchers would compute the average daily number of calories of food consumed per kilogram of body weight for each student during that 7-day period.

Assuming that the students keep accurate records, which plan, I or II, would better meet the goal of the study? Justify your answer.

Plan II would better meet the goal of the study because the study is trying to find out the general idea of difference in consumption of calories of adolscence between urban and rural area. If researchers study a week period of food he or she consume, the data would be more reliable. If researchers only study one day of the food, they can't get the general idea of the number of calories.

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