

PGDM, 2019-21
Statistic for Business Analysis
DM-112

Trimester – I, End-Term Examination: September 2019

Time allowed: 2 Hrs 30 Min
Max Marks: 50

Roll No: _____

Instruction: Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means**. All other instructions on the reverse of Admit Card should be followed meticulously.

Section A

Attempt any two of the questions A1a, A1b and A1c

- A1a. Suppose you are sampling from a population with a mean of 25.75. What sample size will *guarantee* that (CILO-1; 5 marks)
- The sample mean is 25.75?
 - The standard error of the mean is zero?
- Justify your answer.
- A1b. Dr. Ramesh, a noted social psychologist, surveyed 150 top executives and found that 42% of them were unable to add fractions correctly. (CILO-1; 5 marks)
- Estimate the standard error of this estimate
 - Construct a 95% confidence interval for the estimate calculated by Dr. Ramesh
- A1c. According to a study by Decision Analyst, 21% of the people who have credit cards are very close to the total limit on the card(s). Suppose a random sample of 600 credit card users is taken. What is the probability that more than 150 credit card users are very close to the total limit on their card(s)? (CILO-1; 5 marks)

Attempt any one of the questions A2a and A2b

- A2a. A brand manager is concerned that her brand's share may be unevenly distributed throughout the country. In a survey in which the country was divided into four geographic region, a random sampling of 100 consumers in each region was surveyed with the following results. (CILO-3; 10 marks)

	REGION			
	NE	NW	SE	SW
Purchase the brand	40	55	45	50
Do not purchase	60	45	55	50

Does the purchase intention vary across the regions? Frame the hypothesis, and perform the required test to draw your conclusion.

- A2b. A study was conducted to develop a scale to measure stress in the workplace. Respondents were asked to rate 26 distinct work events. Each event was to be compared with the stress of the first week on the job, which was awarded an (CILO-3; 10 marks)

arbitrary score of 500. 60 professional men and 41 professional women participated in the study. One of the stress event was "lack of support from the boss". The men's sample average rating for this event was 631 and the women's sample average rating was 848. Suppose the sample standard deviation for men and for women both were about 100.

- Construct a 95% confidence interval to estimate the difference in the population mean scores on this event for men and women.
- Based on a level of significance of 0.05, can we say that women are more stressed than men? Write down the hypothesis, the test statistic, and justify your conclusions.

Attempt any one of the questions A3a and A3b

- A3a. Three training methods were compared to see whether they lead to greater productivity after training. The following productivity measures for individuals trained by each method. (CILO-2; 10 marks)

							Mean	SD
Method 1	45	40	50	39	53	44	45.17	5.49
Method 2	59	43	47	51	39	49	48.00	6.90
Method 3	41	37	43	40	52	37	41.67	5.57

The grand mean is **44.94** and the overall standard deviation is **6.25**
At $\alpha = 0.05$, do the three training methods lead to different productivity?

- A3b. Outside Magazine tested 10 different models of day hikers and backpacking boots. The following data show the upper support and price for each model tested. Upper support was measured using a rating from 1 to 5, with a rating of 1 denoting average upper support and a rating of 5 denoting excellent upper support. (CILO-2; 10 marks)

Manufacturer and Model	Support	Price
Salomon Super Raid	2	120
Merrell Chameleon Prime	3	125
Teva Challenger	3	130
Vasque Fusion GTX	3	135
Boreal Maigmo	3	150
L.L. Bean GTX Super Guide	5	189
Lowa Kibo	5	190
Asolo AFX 520 GTX	4	195
Raichle Mt. Trail GTX	4	200
Scarpa Delta SL M3	5	220

- Use these data to develop an estimated regression equation to estimate the price of a day hiker and backpacking boot given the upper support rating.
- Estimate the price for a day hiker with an upper support rating of 4.

Section B

B1. A reputed B-School is interested in evaluating the effectiveness of teaching for some papers that are taught by more than one faculty. This B-School has 4 PGDM sections, with each section having roughly 60 students. The papers that are being thus evaluated are

- Marketing Management – I (**MM-1**), where Prof. P teaches Sections A and C and Prof. C teaches Sections B and D
- Information Systems Management for Business (**ISMB**), where Prof. G teaches Sections A and D, while Profs. K and NS teach Sections C and B respectively.

Further, it is a practice in this school that the same professor who teaches also evaluates his/her students. There is however one standard question paper for a particular subject.

The section-wise summary results for Term I for the two papers are as given below.

Paper	Marketing Management - I		
Section	No. of Examinees	Average Marks	SD of Marks
A	58	62	6.8
B	57	61	5.2
C	62	63	7.5
D	63	59	10.5

Paper	Information Systems Management for Business		
Section	No. of Examinees	Average Marks	SD of Marks
A	56	72	7.5
B	57	66	8.5
C	63	71.5	7.3
D	62	68	5.5

Answer the following questions relating to this data.

- For MM-1 what is the overall average score and standard deviation for all the examinees? **(2 marks)**
- Students believe that Prof. P's class performs better than those of Prof. C. Test if the data justifies this belief. Write down your steps and final conclusions clearly. **(CILO-1,3; 5 marks)**
- For the paper ISMB, what is the average marks and standard deviation of marks for students taught by Prof. G? **(2 marks)**
- For ISMB, test if students of Prof. G perform significantly better than the students of Prof. NS. **(CILO-1,3; 5 marks)**
- For ISMB test if the students of all three professors perform equally well **(CILO-1,3; 4 marks)**
- If in this scheme, you find that students of any particular professor perform better than another, can you conclude that the professor for higher-scoring students teaches better than the other professor? Why or why not? **(CILO-1; 2 marks)**