Introduction to Statistical Methods
(S1-21_DSECLZC413) – Assignment 1

Each question carries 2.5 Marks (2.5 x 4 = 10 Marks)

Duration: 11th Dec 2021 – 1st Jan 2022

- *Submissions are individual*
- *Solve these on paper, scan, make pdf and upload*
- *Plagiarism results in zero marks*
- *Write your name, BITS ID and Section on each page*

1. Identify which group is more homogeneous by calculating standard deviation

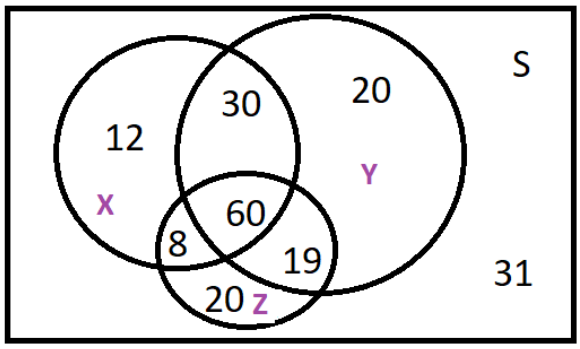
Group 1			Group 2	
Sr	Age in years		Sr	Age in years
1	34		1	41
2	18		2	42
3	36		3	24
4	40		4	39
5	21		5	43
6	23		6	44
7	24		7	33
8	25		8	33
9	31		9	41
10	31		10	44
11	33		11	48
12	33		12	20
13	55		13	27
14	22		14	35
15	25		15	35
16	30		16	25
17	37		17	26
18	40		18	30
19	28		19	39
20	30		20	43

2. If a random variable has a probability density

$$f(x) = \begin{cases} 0 & for\ x \leq 0 \\ kxe^{-4x} & for\ x > 0 \end{cases}$$

Then find k and the probabilities that it will take on a value
a) Between 2 and 4
b) Greater than ¼

3. Among 200 persons interviewed as part of an urban mass transportation study, some live more than 5 miles from the center of the city (X), some now regularly drive their own car to work (Y), some would gladly switch to public mass transportation if it were available (Z). Use the information given in the below figure to find the probabilities the person
   a) Lives more than 5 miles from the center of the city
   b) Lives more than 5 miles from the center of the city given that he or she would gladly switch to public mass transportation
   c) Regularly drives his or her car to work given that he or she lives more than 5 miles from the center of the city
   d) Would not want to switch to public mass transportation given that he or she does not regularly drive his or her car to work



4. A consulting firm rents taxis from three agencies , 20% from agency A, 20% from agency B and 60% from agency C. if 10% of the taxis from A, 12 % of the taxis from B, and 4% of the taxis from C have bad tires.
   a) What is the probability that the firm will get a taxi with bad tires?
   b) What is the probability that a taxi with bad tires rented by the firm came from agency A?