Date : / /

Page No.

(Assignment no 15)

Sol 1 The parametric tests are based on the assumption about the population parameters

Non parametric test does not make any assumption about the population.

Parametric Test	Non Parametric test
Z test, t test	Run test.

Sol 2 Some non parametric tests are.

1. Run test
2. Sign Test
3. Wilcoxon paired sample ring rank test

Sol 3

(A) 8 10 12 13 14 16 18 22

(B) ~~10~~ ~~9~~ 14 ~~8~~ 16 ~~12~~ 20

$n_A = 8$ $n_B = 7$

8 | 8 9 | 10 10 | 12 12 | 13 14 | 14 16 | 16 18 | 20 22

1 2 3 4 5 6 7 8

9

Runs = 9 $U = 9$

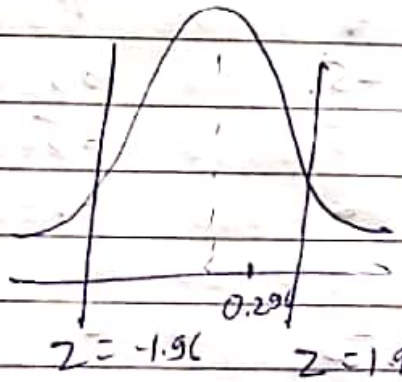
$$E(U) = \left(\frac{2n_1n_2}{n_1+n_2}\right) + 1 = \frac{2\times8\times7}{7+8} + 1 = 8.467$$

Scanned with CamScanner

$$V(x) = \frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1+n_2)^2(n_1+n_2-1)} = \frac{2\times8\times7(2\times8\times7 - 8 - 7)}{(8+7)^2(8+7-1)}$$

$$= \frac{112 \times (112 - 8 - 7)}{15^2 \times 14} = 3.45$$

$$Z = \frac{U - E(U)}{\sqrt{V(U)}} = \frac{9 - 8.45}{\sqrt{3.45}} = 0.296.$$



We cannot reject null hypothesis mean they belong to same population density.

Sol 4

x_i	y_i
14	10
17	15
19	18
21	18
9	11
11	18
16	14
20	29
12	6
16	21
18	17
20	15

H_0 $f(x) = f(y)$

H_1 $f(x) \neq f(y)$

d_i : [+4, -3, +1, +3, -2, -7, +2, -9, +6, -5, +1, +5]

rank : [1, 1, 2, 2, 3, 3, 4, 5, 6, 7, 9]

= [1.5, 1.5, 4, 4, 4, 6, 7, 8.5, 8.5, 10, 11, 12]

Scanned with CamScanner

T

Rank value pair (

difference	Rank
1	1.5
1	1.5
-2	4.
+2	4
2	4
3	6
4	7
-5	8.5.
5	8.5
6	10.
-7	11
-9	12

$(T+) \rightarrow (42.5)$

$(T-) \rightarrow (35.5)$

$\min(T+, T-) \rightarrow 35.5$

$$E(T) = \frac{n(n+1)}{4} = \frac{12}{4} \times 13$$

$$= 39$$

$$V(T) = \frac{n(n+1)(2n+1)}{24}$$

$$= \frac{12 \times 13 \times 25}{24 \quad 2}$$

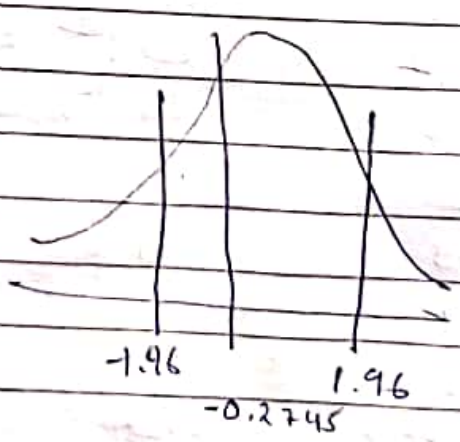
$$= 162.5$$

SD: $= 12.747$

$$Z = \frac{35.5 - 39}{12.747}$$

$= -0.2745$

Now



We cannot reject null hypothesis

$f(x) = f(y)$

Scanned with CamScanner