

**PR/PC/RS34 ---Scheme
Part-A**

1. research design is
2. Case study is the method of describing a particular topic in a detailed and descriptive fashion to highlight the key elements.
3. Good characteristic of Questionnaire- to be successful, comparatively short and simple no should be minimum, logical sequence, dichotomous
- 4 Mean is the average of all data given , median is the middle most values of the data
5. the error arising due to drawing inferences about the population on the basis of few observations. There are biased and unbiased sampling errors.
6. Standard deviation is the root mean square deviation or square root of the mean of the

squared deviations.
$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}}$$

7. Bar diagram, percentage bar-daigram, pie, multiple bar daigram

8. Limits of correlation (-1, 1) (9.)
$$y - \bar{y} = \frac{r\sigma_y}{\sigma_x} (X - \bar{X}).$$

10. Null hypotheses : is the initial assumption for a given data. Alternate hypotheses is the other possible options

Part-B

11. Primary data is the original data or which is collected the person who is conducting the programme. Secondary data is which is already available in some form. -4
Distiguish-----4
- 12 convert to % bar daigram and then draw the figure -----8
- 13 Sampling techniques-random sampling, stratified sampling-----
- 14

X	dx-x-3	Dx ²	Y	Dy=Y-172	dx dy
1	-2	4	160	-12	24
2	-1	1	180	8	-8
3	0	0	140	32	0
4	1	1	180	8	8
5	2	4	200	28	56
sumX=15	0	10	860	0	80

Mean(X) =3 and mean(y) =172-----1

Regression coefficient Y on X= 80/10=8-----3

15. Null hypothesis: Ho=mean1=mean2, Alternative hypotheses:mean1 not equal to mean2-----1

D 10 -2 2 4 -4 sum (D)=10

D²100 4 4 16 16 sum(D²)=140----1 Mean difference =10/5=2-----

estimated Variance S²=30-----1

Standard error= square root(30)/square root(5)=root(6)-----1

Statistic $t = .816$ -----1
 Calculated value is < 4.6 -----2
 Null hypothesis is accepted-----1. there is no significant difference in I.Q. training.-----1

16 Range = $44 - 30 = 14$ -----1
 First quartile = $32 + 21.5 - 12/18 \times 2 = 33.06$ -----2
 Upper quartile = $38 + 64.5 - 60/12 \times 2 = 38.75$ -----2
 Coefficient of Q.D = $.08$ -----2

17. Null hypoth: $M_1 = M_2$, Alternative hypoth: $M_1 \neq M_2$ -----1

$$\text{Test } t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(n_1 - 1)\sigma_1^2 + (n_2 - 1)\sigma_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}} \text{-----1}$$

$= -3.053$ -----2

Dof = $5 + 7 - 2 = 10$ -----1
 Table value at 5% level is 2.228 =====1
 Calculated value is > 2.228 , reject null hypotheses-----1

Difference in sales in 2 towns is significant-----1

18. each part 2marks

Part-C

19a. The difference is insignificant-----1,

	Investigator A	Investigator B	
Poor income group	$= 200 \times 300/500 = 120$	180	
Middle	= 60	90	
Rich	= 20	30	-----4

Investigators	Income groups			Total
	Poor	Middle	Rich	
A	160(120)	30(60)	10(20)	200
B	140(180)	120(90)	40(30)	300
Total	300	150	50	500

$O - E = 40 - 30 - 10 - 40 + 30 + 10$ -----1

$(O - E)^2 / E = 13.33 + 15 + 5 + 8.88 + 10 + 3.33 = 55.54$ -----3

Dof = $(3 - 1)(2 - 1) = 2$ -----1

Tabulated chi-square is 5.991 -----1

Calculated value is $>$ than table value It is significant---1

The sample technique adopted by the investigators differ and not similar-----2

b. For 5 properties -----5

Class	0.5-10.5	10.5-20.5	20.5-30.5	30.5-40.5	40.5-50.5	50.5-60.5	60.5-70.5	70.5-80.5	80.5-90.5	90.5-100.5
mid x	5.5	15.5	25.5	35.5	45.5	55.5	65.5	75.5	85.5	95.5
F	3	7	13	17	12	10	8	8	6	6
D	-4	-3	-2	-1	0	1	2	3	4	5
FD	-12	-21	-26	-17	0	10	16	24	24	30
CF	3	10	23	40	52	62	70	78	84	90

-----8

Arithmetic mean = $A + (\text{sum fd})/N \times c = 45.5 + (28/90) \times 10 = 48.61$ -----4

Median = $l + (n/2 - m)/f \times c = 40.5 + (45 - 40)/12 \times 10 = 44.67$ -----4

Mode = $l + \frac{f_1 - f_0}{2f_1 - (f_0 + f_2)} = 30.5 + 40/9 = 34.94$ -----4

21a.

Judge X	52	53	42	60	45	41	37	38	26	27
Judge Y	65	68	43	38	77	48	35	30	25	50
Rank X	8	9	6	10	7	5	3	4	1	2
Rank Y	8	9	5	4	10	6	3	2	1	7
D ²	0	0	1	36	9	1	0	4	0	25

---6

Total = 76 -----1

Rank = $1 - (6 \times 76) / (10^3 - 10) = .539$ ----- 3

b. drawing the graph =====8 median = 26 -----2

22a. Hypotheses: the samples have been drawn from the same sample-----1

X	(X-mean)	(X-mean) ²	Y	(Y-mean)	(Y-mean) ²
20	-2	4	27	-8	64
16	-6	36	33	-2	4
26	4	16	42	7	49
27	5	25	35	0	0
23	1	1	32	-3	9
22	0	0	34	-1	1
18	-4	16	38	3	9
24	2	4	28	-7	49
25	3	9	41	6	36
19	-3	9	43	8	64
			30	-5	25
			37	2	4
220		120	420		314
	N ₁ =10			N ₂ =12	

-----5

Mean $X=22$, Mean $Y=35$ -----1

Variance $X=13.33$, Variance $Y= 28.5$ -----4

$F=28.55/13.33=2.14$ -----1

Dof(9,11) as ratio >1 , we take Dof(11,9)-----1

Table value 3.11 at 5 los and 5.2 at 1 %level of sig ==1

At both the level we accept the hypoth=====1

b. draw a histogram and mark the mode value---26-----5
