**Q1 MCQ**

1. A sampling frame gives a complete description about:

Ans :- **(a) The population under study**

1. If a constant 50 is subtracted from each of the value of X and Y, the regression coefficients are:

Ans :- **(c) Not changed**

**Q2.**

**Vital statistics :-**

Vital statistics is branch of biometry which deals with data and laws of human mortality , morbidity and demography .

Thomas malthus claimed in 1798 that population increases according to geometric progression and resources such as food grains etc. Increases in arithmetic progression .

**Methods of collecting vital statistics :-**

1. **Census method :-**

Census is conducted at the interval of 10 years in all the countries . Census method consist of complete enumeration of population along with information regarding age , sex , caste , occupation , education , income , marital status etc. Therefore census gives details information about vital statistics .

The main drawback of census method is that the information related to vital event at inter census period cannot be available.

1. **Registration method :-**

In most of the countries vital statistics register are mentioned . The events like birth death and marriage are registered .

The main drawback of registration method is that some of the vital events are not registered . e.g. some birth and deaths are not registered in rural areas . In some communities like Laman , Adivasis the peoples mores from place to place so information is rarely registered . therefore these method under estimates the value of vital statistic.

1. **Sample survey :-**

A sample survey are conducted to get the information which is not available in census or registration of vital events. National sample survey has conducted survey on family planning and morbidity .

**Q3**

**Definations**

**Gross Reproduction Rate (GRR) :-**

In order to estimate reproduction rates we need to consider only female births because female child will be the future mother . To know the appropriate measure of growth we know number of female births in the every age group of women population . GRR is given by ,

GRR= x TFR

TFR=

ASFR =( ) x 1000

Where ,

Bi = number of births of ith age group

Pi = Femal population of ith age group

**Net Reproduction Rate (NRR) :-**

Net reproduction rate per women is a average number of dauther born per women . NRR gives future mothers replaced by present women in the reproductive age group in the population .

If ∏i (0 ∏i 1 ) is the survival factor of females in the ith age group. Then NRR is given by ,

NRR=( x ∏i ) x 1000 x (width of age group )

Where,

Bi = number of female births of ith age group

Pi = Femal population of ith age group

**Example :-**

The population and its distribution by sex and number of births in tehsil in 1991 and survival rates are given below,

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **Females** | **male birth** | **female birth** | **total birth** | **survival rate(**∏i) | **ASFR** | x∏i |
| 15-19 | 5687 | 65 | 60 | 125 | 0.91 | 21.9800 | 0.0096 |
| 20-24 | 5324 | 144 | 132 | 276 | 0.9 | 51.8407 | 0.0223 |
| 25-29 | 4720 | 135 | 127 | 262 | 0.84 | 55.5085 | 0.0226 |
| 30-34 | 3933 | 82 | 81 | 163 | 0.87 | 41.4442 | 0.0179 |
| 35-39 | 3670 | 62 | 56 | 118 | 0.85 | 32.1526 | 0.0130 |
| 40-44 | 3025 | 12 | 15 | 27 | 0.83 | 8.9256 | 0.0041 |
| 45-49 | 2601 | 3 | 3 | 6 | 0.82 | 2.3068 | 0.0009 |
| **Total** | **28960** | **503** | **474** | **977** | - | **214.1584** | **0.0905** |

TFR = = 214.15 x 5 = 1070.75

GRR= x TFR

GRR = x 1070.75 = **519.48**

NRR = ( x ∏i ) x 1000 x (width of age group )

NRR = 0.090465728 x 1000 x 5

NRR = **452.33**

Therefore , GRR > NRR

**Q4**

Suppose data X1, . . . , Xn are i.i.d. and drawn from N(μ , σ2 ), where and σ are unknown. Suppose a data set is taken and we have

n = 49,

sample mean = 92

sample standard deviation S = 0.75

90% confedence interval for μ is

1. α)100% = 90%
2. α) = 0.90

α = 0.10

Z = Z0.05 = 1.64

( Z \* )

(92 1.64 x )

(92 0.1757 )

(91.8243 , 92.1757)

90% confedence interval for μ is **91.8243 to 92.1757**