

Total No. of Questions : 6]

SEAT No. :

PC1006

[6315]-111

[Total No. of Pages :3

S.Y.B.Com.

236-F : BUSINESS STATISTICS - I

(2019 Pattern) (Semester- III)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 and Q.6 are compulsory.
- 2) Solve any 3 questions from Q.2 to Q.5.
- 3) Use of statistical table and calculator is allowed.
- 4) Figures to the right indicate full marks.
- 5) Symbols have their usual meanings.

Q1) A) Choose the correct alternative in each of the following (any five):[5×1=5]

- a) With three attributes the total number of class frequencies of all orders is equal to \_\_\_\_\_.
  - i) 9
  - ii) 27
  - iii) 12
  - iv) 3
- b) The combination of letters ABC of attribute is known as the class of \_\_\_\_\_ order.
  - i) First
  - ii) Second
  - iii) Third
  - iv) Fourth
- c) The residual  $x_{1.23}$  is called as residual of order \_\_\_\_\_.
  - i) 0
  - ii) 1
  - iii) 2
  - iv) 3
- d) In a trivariate study the correlation coefficient between any two variables when third variable held constant is called as \_\_\_\_\_.
  - i) Simple Correlation
  - ii) Multiple Correlation
  - iii) Partial Correlation
  - iv) No Correlation
- e) Which of the following is true?
  - i)  $NRR = GRR$
  - ii)  $NRR > GRR$
  - iii)  $NRR$  can never exceed  $GRR$
  - iv)  $NRR < GRR$
- f) Normally life tables is constructed for an age interval \_\_\_\_\_.
  - i) One year
  - ii) Five year
  - iii) Ten year
  - iv) Five to ten year

P.T.O.

- B) State whether following statements are true or false (any five) [5×1=5]
- Coefficient of association Q between two attributes A and B lies between -1 to 1.
  - If HNO attributes A and B are completely dissociated then coefficient of association Q is equal to -1.
  - If  $R_{1.23} = 0$  then  $R_{2.13} = 0$ .
  - $r_{12.3} = r_{21.3}$ .
  - NRR mainly depends on the number of female births.
  - A life table is a profile of human population.

Q2) Attempt each of the following: [3×5=15]

- In an examination 60% students passed in Marathi, 52% passed in English, while 32% failed in both the subjects. Using relations between class - frequencies in attributes, find the percentages of students passed in both the subjects.
- If  $(A) = (B) = 4$ ,  $N = 8$ , obtain the coefficient of association for  $(AB) = 0$  and  $(AB) = 1$ .
- Define : Attribute, Independence and association of two attributes.

Q3) Attempt each of the following. [3×5=15]

- In the study of multiple regression, define residual, properties of residuals, partial correlation.
- If  $r_{12} = 0.7$ ,  $r_{13} = r_{23} = 0.5$  then compute  $R_{1.23}$  and  $r_{12.3}$ .
- If  $x_1 = 51.21 + 6.88x_2 - 3.71x_3$  is the equation of multiple regression plane of  $x_1$  on  $x_2$  and  $x_3$  then find  $b_{12.3}$ ,  $b_{13.2}$ .
  - If  $R_{1.23} = 1$  then find  $\text{var}(x_{1.23})$ .

Q4) Attempt each of the following: [3×5=15]

- Explain the methods of collecting vital statistics.
- For the following data compute G.F.R. and T.F.R.

Age	15-19	20-24	25-29	30-34	35-39	40-44	45-49
No. of women in 1000	500	450	370	340	360	380	340
No. of births	25,000	76,950	69,930	34,000	18,000	5,130	340

- c) Find S.T.D.R. by indirect method for population A from the following information.

Age - group	0-5	5-15	15-50	50 and above
Population A	12,000	13,000	15,000	10,000
Standard population	8,000	10,000	27,000	5,000
Age - SDR of standard population	50	15	10	60

Total deaths in population A are 1483.

Q5) Attempt each of the following.

[3×5=15]

- a) Define life table, functions  $l_x$ ,  $d_x$ ,  $L_x$ .  
 b) Given the following data :

Age (x)	61	62	63	64	65	66
$l_x$	871	575	366	222	129	71

Find the probability that,

- i) A person aged 63 years will die in next 3 years.  
 ii) A person aged 62 years will survive in next 2 years.  
 c) Fill in the blanks of the following life table which are shown with question mark:

Age (x)	$l_x$	$d_x$	$q_x$	$P_x$	$L_x$	$T_x$
4	880	?	?	?	?	?
5	648	-	-	-	-	11124

Q6) Write short notes on the following: (any 3)

[3×5=15]

- a) Define attribute, classification, dichotomy, types of classes, order of a class.  
 b) Define multiple regression, residuals, properties of residuals.  
 c) Define multiple and partial correlation. State the relation between multiple correlation coefficient in terms of partial and total correlation coefficients.  
 d) Define mortality rates, fertility rates, population growth rates.  
 e) Explain the construction of life table, expectation of life.

