[6142]-211
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.No.1 and Q.No.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) Which of the following is not an example of attribute?
   i) Literacy   ii) Intelligence
   iii) Blindness   iv) No. of pages in a book

b) The range in which multiple correlation coefficient lies is_____.
   i) -1 to 1   ii) 0 to 1
   iii) 0 to ∞ iv) $-\infty$ to ∞

c) Vital statistics is a branch of biometry which deals with data and laws of_____.
   i) Marriages   ii) Births
   iii) Deaths   iv) All the above

d) Normally a life tables is constructed for an age interval_____.
   i) One year   ii) Five years
   iii) Five to ten years   iv) Ten years

e) With the 3 attributes A, B and C, the number of first order classes is_____.
   i) 6   ii) 9
   iii) 12   iv) 3

f) The regression planes coincide if the value of determinant of correlation matrix R, |R| = _____.
   i) 0   ii) 1
   iii) -1 iv) > 0

P.T.O.

B) State whether following statements are true or false (any five): **[5×1=5]**

   a) Beautyness is an example of attribute.

   b) The multiple correlation coefficient R1.23 may be negative.

   c) NRR mainly depends on number of female births.

   d) Life tables are prepared for both humans as well as animals.

   e) If all ultimate class frequencies are non-negative, then data are consistent.

   f) If R 1.23 = 1 then R 2.13 = 1.

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

   a) A report regarding examination is given below:

   Total number of students appeared for examination is 1000, among them 550 were boys. Among them 1000 students, 700 students are successful, 300 students are successful boys. Find the number of successful girls, no.of unsuccessful girls and no.of unsuccessful boys.

   b) Test whether the attributes A and B are independent, given that $(AB) = 10$, $(A\beta) = 30$, $(\alpha\beta) = 40$, $(\alpha\beta) = 120$

   c) Define the following: dichotomy, positive attribute, negative attribute, order of a class-frequency.

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

   a) If $\bar{X}1 = 0, \bar{X}2 = 0, \bar{X}3 = 0, \sigma1 = \sigma2 = \sigma3 = 1$ and $r_{12} = r_{13} = r_{23} = k$ then find the equation of least square regression plane of X_1 on X_2 and X_3.

   b) In a trivariate data the total correlation coefficients are $r_{12} = 0.7$, $r_{13} = -0.8$ and $r_{23} = 0.9$. Are these values consistent?

   c) Explain the concept of multiple correlation in case of trivariate data. Also obtain the expression for multiple correlation coefficient R1.23 in terms of total correlation coefficients r_{12}, r_{13} and r_{23}.

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

   a) Define the terms: Vital event, rate of vital event, C.D.R., C.B.R, Age specific death rate (ASDR).

   b) Compute C.B.R., G.F.R., A.S.F.R. for the following data:

Age-group	15-19	20-24	25-29	30-34	35-39	40-44
No.of Women	24000	20000	15000	12000	6000	4000
No.of births	800	2400	2000	600	120	10

   The total population is 186300

c) Compute G.R.R. and N.R.R. for the following data, comment on result.

Age-group	15-19	20-24	25-29	30-34	35-39	40-44
No.of Women	16000	15000	16500	14000	16000	12000
Female births	160	225	330	210	144	90
Survival rate	0.91	0.90	0.89	0.88	0.87	0.86

Q5) Attempt each of the following: **[3×5=15]**

a) Define life table, construction of life table in detail.

b) Complete the following life table:

Age(x)	lx	dx	qx	Px	Lx	Tx	e_x^0
20	10000	-	-	-	-	-	
21	9873					83269	

c) Given the following data:

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

find the probability that,

i) A person aged 63 will die in next 3 years,

ii) A person aged 62 will survive in next 2 years.

Q6) Write a short note on the following. (any 3) **[3×5=15]**

a) Order of a class, dot operator to find relation between class frequency (upto order 3), fundament set of class frequencies.

b) Residual, properties of residuals, coefficient of regression, relation between regression coefficients and multiple correlation coefficient.

c) Methods of collecting vital statistics, Mortality rates, Fertility rates.

d) Any three application of life-table, Expectation of life.

e) Partial correlation, partial correlation coefficient, relation between multiple, partial and total correlation coefficients.

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