

**Anekant Education Society's**  
**Tuljaram Chaturchand College of Arts, Science and Commerce,**  
**Baramati**  
**Autonomous**

**QUESTION BANK**

**FOR**

***S.Y.B.Com.(SEM-III)***

**Paper-I**

**COMBS2301: Business Statistics III**

## UNIT 1: Theory of Attributes

### A) Questions for 1 mark

#### I] Choose the correct alternative

1. A qualitative characteristic is called:  
(a) Constant                      (b) Variable                      (c) Attribute                      (d) Association
2. If an attribute has two classes, it is called:  
(a) Trichotomy                      (b) Simple classification                      (c) Dichotomy                      (d) Mainfold classification
3. If an attribute has more than two classes, it is said to be:  
(a) Mainfold classification                      (b) Trichotomy                      (c) Dichotomous                      (d) All of the above
4. The total of all frequencies N is of order:  
(a) Zero                      (b) One                      (c) Two                      (d) Three
5. In case of consistent data, no class frequency can be:  
(a) Positive                      (b) Negative                      (c) Both (a) and (b)                      (d) Neither (a) and (b)
6. With two attributes A and B, the total number of ultimate frequencies is:  
(a) Two                      (b) Four                      (c) Six                      (d) Nine
7. The Yule's coefficient of Association(Q) is always lies between:  
(a) -1 and +1                      (b) 0 and 1                      (c) -1 and 0                      (d) 0 and 5
8. If the class frequency  $(AB) = 0$ , the value of Q is equal to:  
(a) 0                      (b) 1                      (c) -1                      (d) 0 to 1
9. If the class frequency  $(\alpha B) = 0$ , the value of Q will be:  
(a) -1                      (b) +1                      (c) 0                      (d)  $\infty$
10. If for two attributes the class frequency  $(AB) = (\alpha B) = 0$ , the value of the coefficient of association is:  
(a) -1                      (b) +1                      (c) 0                      (d)  $\infty$
11. If for two attributes the class frequencies  $(AB)(\alpha\beta) = (A\beta)(\alpha B)$ , then Q is equal to:  
(a) 0                      (b) -1                      (c) +1                      (d)  $\infty$
12. If two attributes A and B are independent then the coefficient of association is:  
(a) -1                      (b) +1                      (c) 0                      (d) 0.5

13. If for two attributes A and B, the class frequencies  $(AB)(\alpha\beta) = (A\beta)(\alpha B)$ , then A and B are called:

- (a) Independent (b) Positively associated (c) Negatively associated (d) All of the above

14. If  $(AB)(\alpha\beta) > (A\beta)(\alpha B)$ , then A and B are said to be:

- (a) Negatively associated (b) Positively associated (c) Independent (d) Difficult to tell

15. If two attributes A and B hold the relation  $(AB)(\alpha\beta) < (A\beta)(\alpha B)$ , then:

- (a) A and B are positively associated (b) A and B are independent  
(c) A and B are negatively associated (d) A and B are dependent

16. If two attributes A and B have perfect positive association the value of coefficient of association is equal to:

- (a) +1 (b) -1 (c) 0 (d)  $(r-1)(c-1)$

17. A characteristic which varies in quality from one individual to another is called:

- (a) Variable (b) Constant (c) Attribute (d) Statistic

18. The eyes colour of 100 women is:

- (a) Variable (b) Constant (c) Attribute (d) Discrete

19. The order of class frequency (ABC) is

- (a) 1 (b) 3 (c) 0 (d) 2

20. If the Yule's coefficient of Association (Q) between two attributes A and B is  $-0.675$  then:

- (a) A and B are positively associated (b) A and B are independent  
(c) A and B are negatively associated (d) A and B are dependent

21. If  $(AB) = 178$ ,  $(A\beta) = 152$  and  $(B) = 400$  then the value of (A).

- (a) 248 (b) 222 (c) 26 (d) 330

22. Given that  $(AB) = 256$ ,  $(A) = 304$ ,  $(B) = 1024$  and  $N = 1216$ . Then two attributes are

- (a) independent (b) dependent  
(c) positively related (d) negatively related

23. Which of the class are positive classes?

- (a) (AB) (b) (B)  
(c) (C) (d) All the above

24. Which of the class are negative classes?

- (a) - (AB) (b) (B)  
(c) ( $\beta$ ) (d) ( $A\beta$ )

25. If two attributes A and B have positive association then value of coefficient of association is equal to:

- (a) greater than 0 (b) less than 0 (c) equal to 0 (d) All the above

26. If there are two attributes A and B then the total number of class frequencies is

- (a) 2 (b) 4 (c) 8 (d) 9

27. If there are three attributes A, B and C then the total number of class frequencies is

- (a) 27 (b) 3 (c) 9 (d) 26

28. Positive attribute is denoted by

- (a) Capital Letter (b) Small Letter (c) Greek Letter (d) Capital and Greek Letter

29. If  $(ABC) = 26$  and  $(AB\gamma) = 38$  then the value of (AB) is

- (a) 38 (b) 64 (c) 12 (d) -12

30. The Yule's coefficient of Association(Q) is used to find relationship between two :

- (a) Variable (b) Constant (c) Attribute (d) None of these

**III] State whether the following statements are True or False:**

1. If the class frequency  $(AB) = 0$ , the value of Q is equal to 0.
2. If two attributes A and B are independent then the coefficient of association is equal 1.
3. A characteristic which varies in quality from one individual to another is called attribute.
4. If there are n attributes then the total number of ultimate frequencies is  $2^n$ .
5. The coefficient of Association(Q) is always lies between 0 and 1.
6. Coefficient of association is correlation between two variables.
7. Attribute can be measurable in terms of units.

**III] Answer the following (1 mark each)**

1. Define 'positive class frequencies' with an illustration.
2. Define 'negative class frequencies' with an illustration.
3. Define 'Ultimate frequencies' with an illustration.
4. Define 'Order of class' with an illustration.
5. Define 'Mainfold classification' with an illustration.

**B) Question of 2marks**

1. Given that  $(AB) = 256$ ,  $(A) = 304$ ,  $(B) = 1024$  and  $N=1216$ . State whether the two attributes are independent.
2. Define an attribute. State the condition when two attributes are independent.
3. From the following set of positive frequencies:  $N=64$ ,  $(AB) = 9$ ,  $(A) = 23$ ,  $(B) = 13$ . State whether the two attributes are independent.
4. Write the order of following class frequencies  $(ABC)$ ,  $(AB)$ ,  $(A)$  and  $N$ .
5. Given  $(AB) = 178$ ,  $(A\beta) = 152$ , find the value of  $(A)$ .

**C) Questions for 4 marks**

1. Calculate the coefficient of association between Locality and Employment from the following information:

Rural and Employed	= 1286
Urban and Employed	= 223
Rural and Unemployed	= 115
Urban and Unemployed	= 2286

Comment on the nature of association.

2. The following is the information on employment and education.

Employed graduates	= 286
Unemployed graduates	= 48
Employed un-graduates	= 450
Unemployed un-graduates	= 216

Compute the coefficient association between these two attributes. Comment on the nature of association.

3. In a survey conducted for 5000 citizens about the reading news paper is gives as below:

Reading Marathi & English news paper	= 2000
Reading Marathi but not reading English news paper	= 2000
Not reading Marathi but reading English news paper	= 500
Not reading Marathi & English news paper	= 500

Calculate the coefficient of association between two attributes. Comment on the nature of association.

4. Calculate the coefficient of association between education of fathers and that of sons given that:

Educated fathers with Educated sons	= 20
Educated fathers with Un-educated sons	= 16
Un-educated fathers with Educated sons	= 50
Un-educated fathers with Un-educated sons	= 40

Comment on the nature of association.

5. Total number of candidates appeared in examination is 1000. There are 550 boys among 1000. 700 candidates were successful. Number of successful boys is 300. Find the no. of successful girls, no. of unsuccessful girls and no. of unsuccessful boys.

6. In survey of 100 families it was found that 50 were inflected with cholera, 25 inflected typhoid, 20 were inflected by both. Find the number of families inflected by either of the disease, none of disease.

#### **D) Questions for 6 marks**

1. Out of 80 students, 35 play cricket, 42 play hockey, 25 play football, 8 play both cricket and hockey, 10 play both cricket and football, 7 play both hockey and football, 3 play all three games. Obtain the number of students playing

- only two games
- at least two games
- only one game.

2. Given  $N=1800$ ,  $(A)=850$ ,  $(B)=780$ ,  $(C) = 326$ ,  $(AB)=250$ ,  $(AC)=144$ ,  $(BC)=122$ ,  $(ABC)=50$ . Find the following frequencies:  $(AB\gamma)$ ,  $(A\beta C)$ ,  $(\alpha BC)$ ,  $(\alpha B\gamma)$  and  $(A\beta\gamma)$ .

3. Given  $(ABC) = 26$ ,  $(A\beta C) = 18$ ,  $(AB\gamma) = 38$ ,  $(A\beta\gamma) = 12$ ,  $(\alpha BC) = 12$ ,  $(\alpha\beta C) = 6$ ,  $(\alpha B\gamma) = 16$ ,  $(\alpha\beta\gamma) = 9$ . Find  $(A)$ ,  $(AB)$ ,  $(A\beta)$ ,  $(AC)$ ,  $(BC)$ .

4. Find out the remaining class frequencies given the following of the positive classes.  
 $N=12000$ ,  $(A)=977$ ,  $(B)=1185$ ,  $(C)=596$ ,  $(AB)=453$ ,  $(AC)=284$ ,  $(BC)=250$ ,  $(ABC)=127$ .
5. Construct one case study which may be applied for society using attribute theory.

## UNIT 2: Multiple Regression, Multiple and Partial Correlation

### A) Questions for 1 mark

#### I] Choose the correct alternative

1. The range of multiple correlation is equal to:  
 (a) -1 to +1                      (b) -1 to 0                      (c) 0 to 1                      (d) 0 to  $\infty$
2. The range of partial correlation is equal to:  
 (a) -1 to +1                      (b) -1 to 0                      (c) 0 to 1                      (d) 0 to  $\infty$
3. In  $R_{1.23}$ , which is the dependent variable?  
 (a)  $X_1$                       (b)  $X_2$                       (c)  $X_3$                       (d) None of above
4. In  $R_{2.13}$ , which are the independent variables?  
 (a)  $X_1, X_2$                       (b)  $X_2, X_3$                       (c)  $X_1, X_3$                       (d) None of above
5. A measure of extent of linear relationship between  $X_1$  with other variables  $X_2$  and  $X_3$  is given by  
 (a) Simple Correlation                      (b) Multiple Correlation  
 (c) Partial Correlation                      (d) Multiple Regression
- 6 Given  $r_{12} = 0$ ,  $r_{13} = 0$  and  $r_{23} = 0.25$ , the value of  $R_{2.13}$  is given by  
 (a) 0.75                      (b) 0.25                      (c) -1                      (d) 0
- 7 Which of the following is not real life situation of multiple regression?  
 (a) Yield of crop is depends on temperature, rainfall.  
 (b) Marks of student is depends on number of hours study by student, I.Q. of student.  
 (c) Number of police force is depends on area of city, population of city.  
 (d) Price of commodity is depends on amount of supply.

8 What is value of  $R_{11}$  from correlation coefficient matrix of variables  $X_1, X_2, X_3$ .

- (a)  $(1 - r_{23} \cdot r_{23})$       (b)  $-(1 - r_{23} \cdot r_{23})$       (c)  $(1 - r_{13} \cdot r_{13})$       (d)  $-(1 - r_{13} \cdot r_{13})$

9 Given the following multiple regression equation of plane of regression of  $X_3$  on  $X_1$  and  $X_2$  is  $X_3 = 1.5X_1 + 17.5X_2 + 11.575$ . Then estimated value of  $X_3$  when  $X_1 = 9$  and  $X_2 = 4$  is

- (a) 95.075      (b) 175.075      (c) 11.575      (d) 163.5

10 Given  $r_{12} = 0.6$ ,  $r_{13} = 0.5$  and  $r_{23} = 0.8$ , the value of  $R_{1.23}$  is

- (a) 0.3611      (b) 0.6009      (c) - 0.3611      (d) - 0.6009

11 If the variable is depend on two or more variable then we can use following technique for estimation

- (a) Simple Regression      (b) Multiple Correlation  
(c) Partial Correlation      (d) Multiple Regression

12. In Multiple regression theory  $R_{1.23}$  notation is used for

- (a) Simple Correlation      (b) Multiple Correlation  
(c) Partial Correlation      (d) Linear Regression

13. In Multiple regression theory  $r_{12.3}$  notation is used for

- (a) Simple Correlation      (b) Multiple Correlation  
(c) Partial Correlation      (d) Linear Regression

14. All the diagonal elements ( $r_{11}, r_{22}, r_{33}$ ) in correlation matrix is always

- (a) 0      (b) 1      (c) -1      (d) Any value

15. What is value of  $R_{22}$  from correlation coefficient matrix of variables  $X_1, X_2, X_3$ .

- (a)  $(1 - r_{23} \cdot r_{23})$       (b)  $-(1 - r_{23} \cdot r_{23})$       (c)  $(1 - r_{13} \cdot r_{13})$       (d)  $-(1 - r_{13} \cdot r_{13})$

16. Which of the following is real life situation of multiple regression?

- (a) Yield of crop is depends on rainfall.  
(b) Marks of student is depends on I.Q. of student.  
(c) Price of commodity is depends on supply of commodity and demand of commodity.  
(d) Weight of student is depends on age of student.

17. In Multiple regression theory  $r_{23}$  is called as

- (a) Simple Correlation
- (b) Multiple Correlation
- (c) Partial Correlation
- (d) Linear Regression

18. Student made calculations on the tri-variate data and he obtained the result  $R_{1.23} = 1.987$  then

- (a) Consistent of data
- (b) Not consistent of data
- (c) Positive Correlation
- (d) None of above

**II] State whether the following statements are True or False:**

1. Multiple correlation is lies between -1 and 1.
2. Partial correlation is lies between 0 and 1.
3. A regression analysis with two or more independent variables is referred to as multiple regression analysis.
4. Partial correlation is simple correlations lies between two residuals.
5. In multiple regression theory,  $r_{12}$ ,  $r_{13}$  and  $r_{23}$  are called as simple correlations.
6.  $R_{1.23} = 0 \Rightarrow R_{2.13} = R_{3.12} = 0$

**III] Answer the following (1 mark each)**

Define the following:

1. Partial Correlation.
2. Multiple Correlation.
3. Multiple Regression.
4. Estimate.
5. Correlation Matrix.

**B) Question of 2marks**

1. Give any two real life situations for multiple regressions.
2. Given  $r_{12} = 0$ ,  $r_{13} = 0$  and  $r_{23} = 0.25$ , find  $R_{2.13}$ .
3. Given  $r_{12} = r_{13} = r_{23} = r$ , find  $R_{1.23}$ .
4. Given  $r_{12} = r_{13} = r_{23} = k$ , find  $r_{12.3}$ .
5. Write correlation coefficient matrix for three variables.

**C) Questions for 4 marks**

1. Given  $r_{12} = 0.6$ ,  $r_{13} = 0.5$  and  $r_{23} = 0.8$ , find  $R_{1,2,3}$ .
2. Given  $r_{12} = 0.8$ ,  $r_{13} = 0.3$  and  $r_{23} = 0.4$ , find  $r_{12,3}$ .
3. Student made calculations on the tri-variate data. The following results are obtained:

$$r_{12} = 0.28 \quad r_{13} = 0.42 \quad r_{23} = 0.51$$

Check the consistency of data.

4. What do you mean by multiple correlations? Explain how it is differ than simple correlations.
5. How multiple correlation is differ than partial correlation.

**D) Questions for 6 marks**

1. Given the following information find equation of plane of regression of  $X_1$  on  $X_2$  and  $X_3$ . Also estimate value of  $X_1$  when  $X_2 = 161$  and  $X_3 = 169$ .

Variable	Mean	SD	Correlations
$X_1$	170	2.4	$r_{12} = 0.28$
$X_2$	160	2.7	$r_{13} = 0.49$
$X_3$	168	2.7	$r_{23} = 0.51$

2. Given the following information find equation of plane of regression of  $X_3$  on  $X_1$  and  $X_2$ . Also estimate value of  $X_3$  when  $X_1 = 9$  and  $X_2 = 4$ .

Variable	Mean	SD	Correlations
$X_1$	6.8	1	$r_{12} = 0.6$
$X_2$	7	0.8	$r_{13} = 0.7$
$X_3$	74	9	$r_{23} = 0.65$

3. Given the following information find equation of plane of regression of  $X_1$  on  $X_2$  and  $X_3$ . Also estimate value of  $X_1$  when  $X_2 = 6.5$  and  $X_3 = 6$ .

Variable	Mean	SD	Correlations
$X_1$	28.02	4.42	$r_{12} = 0.3$
$X_2$	4.91	1.10	$r_{13} = 0.4$
$X_3$	5.94	8.5	$r_{23} = 0.56$

4. In a study of random samples the following results were obtained :

$$\bar{X}_1 = 6.8 \quad \bar{X}_2 = 7 \quad \bar{X}_3 = 74$$

$$\sigma_1 = 1 \quad \sigma_2 = 0.8 \quad \sigma_3 = 9$$

$$R_{31} = -0.31 \quad R_{32} = -0.23 \quad R_{33} = 0.64$$

Obtain the equation of least square regression plane of  $X_3$  on  $X_1, X_2$ . Also estimate value of  $X_3$  when  $X_1 = 9$  and  $X_2 = 4$ .

5. Construct one case study using multiple regressions which may be applied for business.

### **UNIT 3: Vital Statistics**

#### **A) Questions for 1 mark**

##### **I] Choose the correct alternative**

1. Generally vital rate are measure per:

- (a) 100      (b) 1000      (c) 10000      (d) 100000

2. TFR is given for per:

- (a) 1000 women      (b) 1000 reproductive age women  
(c) 10000 women      (d) 100000 reproductive age women

3. GRR is measure

- (a) Population Growth      (b) Birth Rate  
(c) Death Rate      (d) Death Growth

4. Vital events are events related to

- (a) Animal      (b) Human  
(c) Machine      (d) All Above

5. The comparison of death rates for two populations can be done by using

- (a) CDR      (b) ASDR  
(c) STDR      (d) All Above

6. If  $GRR > 1$  then population

- (a) growth is decreasing.
- (b) growth is increasing.
- (c) growth is constant.
- (d) None of above.

7 The relation between GRR and NRR is

- (a)  $GRR = NRR$
- (b)  $GRR > NRR$
- (c)  $GRR < NRR$
- (d) None of above.

8. If  $NRR < 1$  then population

- (a) growth is decreasing.
- (b) growth is increasing.
- (c) growth is constant.
- (d) None of above.

9. If  $(STDR)_A = 13.5$  and  $(STDR)_B = 13.9$  then

- (a) population A is healthy than population B
- (b) population B is healthy than population A
- (c) population A and population B are equally healthy
- (d) None of above.

10. The following is vital events

- (a) Birth
- (b) Death
- (c) Marriage
- (d) All of above.

11. Reproductive age of female is

- (a) 15-49 years
- (b) 15 years and above
- (c) 10-49 years
- (d) None of above

12. Which of the following is not the measure of mortality rate?

- (a) CDR
- (b) SFR
- (c) SDR
- (d) STDR

13. Which of the following is not the measure of fertility rate?

- (a) CDR
- (b) SFR
- (c) GRR
- (d) CBR

14. The vital statistics is also called as

- (a) Life Study
- (b) General Statistics
- (c) Demography
- (d) All Above

15. The collection of data under Census method is organize in interval of

- (a) 10 years
- (b) 1 years
- (c) 5 years
- (d) None of these

16. The collection of data about death, birth and marriage is covered under

- (a) Census method
- (b) Registration Method
- (c) Analytical Method
- (d) All Above

17. We can analyze the vital data under the method of

- (a) Census method
- (b) Registration Method
- (c) Analytical Method
- (d) All Above

18. Which event is related with mortality rate?

- (a) Accidental death
- (b) Marriage
- (c) Birth
- (d) All Above

19. Which event is related with fertility rate?

- (a) death
- (b) Marriage
- (c) Birth
- (d) All Above

20. Vital Statistics is used for

- (a) Insurance Company                      (b) Social welfare  
(c) Growth Performance                      (d) All Above

21. If value of TFR is 3004 then the average no. of children in a family is

- (a) 5                      (b) 4                      (c) 3                      (d) 1000

22. For the calculation of CDR, we consider population

- (a) Whole population                      (b) Only female  
(c) Only male                      (d) None of above

23. For the calculation of GFR, we consider population

- (a) Whole population                      (b) Only female  
(c) Only male                      (d) None of above

24. For the calculation of TFR, we consider population

- (a) All women                      (b) Women in reproductive age  
(c) Whole population                      (d) None of above

25. For the calculation of CBR, we consider population

- (a) Whole population                      (b) Only female  
(c) Only male                      (d) None of above

26. For the calculation of NRR we consider that

- (a) Women in reproductive age never die                      (b) Daughter never die  
(c) Women in reproductive age may die                      (d) None of above

**II] State whether the following statements are True or False:**

1. Vital event is event related with animal.
2. Crude death rates are used for comparison of healthy population.
3. Standardized death rates are used for comparison of healthy population.
4. If  $GRR > 1$  then population growth is decreasing.
5. Value of GRR is always greater than NRR.

**III] Answer the following (1 mark each)**

1. Define vital event. State any three vital events.
2. State three methods of collection of vital statistics.
3. What do you mean by vital statistics?
4. Give any two uses of vital statistics.
5. What do you mean by mortality?

**B) Question of 2marks**

1. Explain how vital statistics is used in social development?
2. State all the measures of mortality rate.
3. Interpret the result when TFR is 2390.
4. Interpret the result when NRR is 1.455.

**C) Questions for 4 marks**

1. Compute the CDR and STDR for two population A and B taking population A as standard population. :

Age Group	A		B	
	Population	Deaths	Population	Deaths
0-10	15000	300	10000	280
10-30	30000	600	25000	400
Above 30	20000	800	15000	750

2. Compute the CDR and STDR for two population A and B taking population B as standard population. :

Age group	A		B	
	Population	Deaths	Populations	Deaths
Under 5	32000	420	42000	625
5 – 30	55000	1450	62500	1460
Above 30	25000	1350	31500	1350

3. What do you mean by fertility? State any three measures of fertility rate in brief.
4. What do you mean by growth rate? State GRR and NRR and interpret it.
5. Describe the method of registration from vital statistics.

#### D) Questions for 6 marks

1. Calculate G.F.R., T.F.R., Age-S.F.R., and G.R.R. for the following data. Assume that proportion of female births is 47.7%.

Age group (in years)	No. of Women (in 000)	Total Births
15-19	8000	560
20-24	10000	1000
25-29	12000	840
30-34	6000	360
35-39	3000	150
40-44	5000	50
45-49	4000	40

Also comment on the results of T.F.R. and G.R.R.

2. Calculate G.F.R., T.F.R., Age-S.F.R., and G.R.R. for the following data. Assume that proportion of female births is 43.5%.

Age group (in years)	No. of Women (in 000)	Total Births
15-19	32	800
20-24	30	3420
25-29	28	4200
30-34	25	2860
35-39	22	1920
40-44	20	600
45-49	10	10

Also comment on the results of T.F.R. and G.R.R.

3. Calculate T.F.R., G.R.R. and N.R.R. for the following data.

Age group (in years)	Survival Rate	ASFR	Female ASFR
15-19	0.88	98	50
20-24	0.82	169.6	84.84
25-29	0.85	158.2	76.93
30-34	0.80	139.7	64.58
35-39	0.78	98.6	50.21
40-44	0.77	42.8	22.99
45-49	0.75	16.9	8.04

Also comment on the results of T.F.R., G.R.R. and N.R.R.

4. Construct one case study which may be applied for society.

## UNIT 4: Life Tables

### A) Questions for 1 mark

#### I] Choose the correct alternative

- Life table provides a broad picture of
  - only mortality
  - only survivorship
  - mortality and survivorship
  - fertility
- Life tables are used by
  - life insurance companies
  - Government
  - Vehicle companies
  - All the above
- Given  $d_{80} = 2018$ ,  $l_{80} = 13987$ , the value of  $l_{81}$ .
  - 16005
  - 13988
  - 11969
  - None of above.
- Given  $l_{80} = 13987$ ,  $l_{81} = 11969$ , the value of  $L_{80}$ .
  - 12978
  - 13988
  - 11969
  - None of above.
- Given  $d_{80} = 2018$ ,  $l_{80} = 13987$ , the value of  $q_{80}$ .
  - 0.1443
  - 0.8557
  - 1
  - None of above.
- If  $T_{20} = 75$ ,  $l_{20} = 66$  and  $L_{20} = 49$  then the value of  $e_{20}$ 
  - 1.5306
  - 0.88
  - 1.1364
  - None of above.

7. Life tables are prepared for
- (a) Animals    (b) Humans    (c) (a) & (b)    (d) None of the above
8. By using Life tables, life insurance companies are estimate
- (a) the average life expectancy of persons.    (b) the average life of persons.
- (c) life expectancy of persons.    (d) None of above
9. Given  $l_8 = 500$ ,  $l_9 = 380$ , find  $d_8$ .
- (a) 500    (b) 880
- (c) 440    (d) 120
10. Given that the expectation of life at year 20 is 31 and  $l_{20} = 550$  then value of  $T_{20}$ .
- (a) 17050    (b) 17.74
- (c) 581    (d) None of above

**II] State whether the following statements are True or False:**

1. Life tables are not prepared for animals.
2. Life tables are also called a mortality table.
3. Life tables are used by life insurance companies in order to estimate the average life expectancy of persons.
4. In Life tables the deaths are equally distributed throughout the year.
5. A hypothetical cohort of life table usually comprises of 1,000 or 10,000 or 1,00,000 births.

**III] Answer the following (1 mark each)**

**A) Define the following:**

1. Expectation of life
2. Life Table
3. Cohort
4.  $L_x$
5.  $T_x$

**B) Question of 2marks**

1. State any two applications of life table.
2. What is concept of the life table?
3. Given  $d_{80} = 2018$ ,  $l_{80} = 13987$ , find  $l_{81}$ .
4. Compute  $T_{20}$ . Given that the expectation of life at year 20 is 31 and  $l_{20} = 550$ .
5. Interpret at least 5 columns of life table.

**C) Questions for 4 marks**

1. Fill in the blanks of the following life table which are shown with the question marks. :

Age(x)	$l_x$	$d_x$	$q_x$	$p_x$	$L_x$	$T_x$	$e^0_x$
20	10000	?	?	?	?	?	?
21	9873	--	--	--	--	83269	?

2. Fill in the blanks of the following life table which are shown with the question marks. :

Age(x)	$l_x$	$d_x$	$q_x$	$p_x$	$L_x$	$T_x$
7	880	232	?	?	?	?
8	?	--	--	--	--	11124

3. Two persons X aged 47 and Y aged 51, find the probability that
  - (i) Both survive 10 years
  - (ii) At least one survives 10 years.
4. What is the average number of persons who might to be expected to die between the ages 60 and 65 out of 1000 persons ages 58 years? (Given  $l_{60} = 58842$ ,  $l_{65} = 49309$ ,  $l_{58} = 62136$ )

**D) Questions for 6 marks**

1. Given the number of dogs at age  $x$ , complete the life table having columns  $dx$ ,  $Px$ ,  $qx$ ,  $Lx$ .

Age( $x$ )	3	4	5	6	7	8
$l_x$	80	74	66	32	10	0

2. Given the number of pigs at age  $x$ , complete the life table having columns  $dx$ ,  $Px$ ,  $qx$ ,  $Lx$ .

Age( $x$ )	5	6	7	8	9	10
$l_x$	1000	940	780	590	25	0

3. Construct one case study which may be applied for life table.

**-00-00-**