EXERCISES ON CHAPTER 2

Theory

1. (a) Define Classification. What part does it play in Statistics? State the different methods of classification of statistical data. [C.U. B.Com. 2008; D.U. B.Com. 1996]
   (b) Name the different methods of presentation of statistical data. [C.U. B.Com. 1996]
   (c) Write short notes on Primary and Secondary data. [B.U. B.Com (H) 2005]

2. (a) Discuss the function and importance of Tabulation in a scheme of statistical investigation. What precautions should be taken in tabulation of data?
   (b) Explain the term Frequency Distribution.

3. (a) Discuss briefly the purpose served by tabulation. State the requirements of a good statistical table. [D.U. B.Com. 1996; Bangalore U. B.Com. 1993]
   (b) What is meant by Tabulation? [V.U. B.Com (H) 2010]

4. Discuss the different steps in the construction of a frequency distribution of raw data. [D.U. B.Com. 1996]

5. What do you mean by a cumulative frequency distribution? Point out its special advantages and uses.

6. (a) Define a Statistical Table and state the essentials of a good table.
   (b) What are the different parts of Statistical Table? [C.U. B.Com. 1991; V.U. B.Com. 1997]

7. Explain with example the exclusive method and the inclusive method of determining limits of class intervals. [D.U. B.Com. 1995]

8. Explain with example both *less than* and *more than* types of cumulative frequency distribution.

Problems

1. (a) Prepare a blank table to show the number of candidates sex-wise, appearing for the Pre-University, First Year, Second Year and Third Year of Bachelor Degree examinations of a university in the faculties of Arts, Science and Commerce in a certain year.
   (b) Draw a blank table showing the distribution of students in a college with three faculties — Science, Commerce and Humanities for first year, second year and third year pass classes only for the year 2000-2001. [C.U. B.Com. 1999]

2. Prepare a blank table to show the exports of three companies A, B, C to the five countries UK, USA, Russia, France and West Germany, in each of the years 2000–04.

3. Prepare a blank table to show the distribution of population of the various States and Union Territories of India, according to sex and literacy.

4. (a) Present the following information in a suitable tabular form supplying the figures not directly given:
   In 1995, out of a total of 4000 workers in a factory 3300 were members of a trade union. The number of women workers employed was 500 out of which 400 did not belong to any Union.
   In 1994, the number of workers in union was 3450 of which 3200 were men. The number of non-union workers were 760 of which 330 were women. [C.U. B.Com. 2000 Type]

(b) In 1994, out of a total of 3600 workers in a factory 2050 were members of trade union. The number of women workers employed were 1200 of which 650 did not belong to any union.
In 1999, the number of workers in the union was 2600 of which 1800 were men. The number of non-union workers was 1900 of which 1200 were women. Present the information in a suitable table.

[C.U. B.Com. 2000]

[Hints: See worked-out Ex. 2 in Section 2.8 (Statistics).]

5. There are two families *A* and *B* whose monthly average expenses are classified under five heads, viz., (a) House rent, (b) Household, (c) Education, (d) Medical and (e) Miscellaneous. Family *A* expends ₹150 as monthly house rent whereas *B* expends ₹100 only. Family *A* expends double the amount under the head (b) as *B* expends on account of (a). Expenditures under (c) are ₹40 and ₹50, where *A* expends more than *B*. Medical expenses of family *B* is ₹5 more than that of *A*. Total expenses under the head (e) of the two families taken together is ₹50. Medical expenses of *A* is half its expenses under (c). Household expenses of family *B* is six times its expenses on account of (d). Total expenses of family *A* is ₹460.

Present the above information for comparison in a net tabular form.

6. Draw up a blank table to show the number of employees in a large commercial firm, classified according to:

(a) Sex: male and female;

(b) Three age-groups: below 30, 30 and above but below 45, 45 and above; and

(c) Four income-groups: below ₹400, ₹400–750, ₹750–1000, above ₹1000.

7. Design blank table, with proper title, headings and sub-headings, to present data relating to the distribution of the employees of a factory classified according to:

(a) Sex: Male and Female;

(b) Age in years: Below 25, between 25 and 34, between 35 and 44, and 45 and above;

(c) Category: Skilled and Unskilled; and

(d) Wage in ₹: Less than 500, between 500 and 750, and above 750.

[Hints: The distribution of the employees of a factory classified according to Sex, Age, Category and Wages in ₹.]

Age in Years / Category / Sex / Wages in ₹	Below 25				25–34				35–44				45 and above				Total
	Skilled		Unskilled		Skilled		Unskilled		Skilled		Unskilled		Skilled		Unskilled		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
1. Less than 500																	
2. 500–750																	
3. Above 750																	
Total																	

8. Represent the statistical information contained in the following passage in a suitable tabular form:

The cropped area of vegetables (excluding potatoes) grown for human consumption in the U.K. rose in 2005–06 and was the highest since 2000–01. The cropped area increased to 509,000 acres, some 11,000 acres more than in 2004–05. The area of root-vegetables increased by 8,100 acres to 62,400 acres, carrots alone increasing by 5,700 acres to 33,200 acres. The area of cabbage rose slightly, thus halting the steady decline since 1997–98; the cropped area was 75,700 acres with 74,800 acres in 2004–05. The cropped area of cauliflower and broccoli was 33,400 acres, 2,400 acres less than in 2004–05. Peas (harvested dry) decreased by about 121,800 acres to 9,800 acres, but a larger area of beans, mainly broad beans and green peas were grown. The area of broad beans increased by 2,600 acres to 7,300 acres and the area of green peas for canning and quick freezing rose by 7,000 acres to 50,400 acres.

9. (a) Present the following information in a tabular form and suggest a suitable title:

The production of 10.95 lac tons of rice in Maharashtra in 2002–03 was the lowest in the period since 1995–96. In 2003–04, however, it has shown a spectacular recovery and reached the level of 15.14 lac tons. During 2003–04 wheat and bajri output decreased. The production of bajri which was 5.50 lac tons in 2002–03 declined to 4.51 lac tons in 2003–04. The production of wheat also decreased from 4.63 lac tons in 2002–03 to 3.43 lac tons in 2003–04. The area under pulses has shown a decreasing trend and the production was less by 22,000 tons in 2003–04 than the production of 8.89 lac tons in 2002–03.

(b) In a trip organized by a college there were 100 persons, the average cost works out to be ₹15.60 per head. There were 80 students each of whom pays ₹16. Members of the teaching staff were charged at a higher rate. The number of servants was 6 (all males) and they were not charged. The number of ladies was 20% of the total of which two were lady staff members.

Tabulate the above information in proper tabular form. [CA Nov. 1998]

[Hints:

Types of Participant	Sex		Total	Contribution per head	Total Contribution (₹)
	Male	Female			
1. Students	62	18	80	16	1280
2. Teaching Staff	12	2	14	20	280
3. Non-teaching Staff	6	0	6	0	0
Total	80	20	100		1560

Working: ₹15.60 × 100 = ₹1560; ₹16 × 80 = ₹1280; ∴ ₹1560 − ₹1280 = ₹280.]

10. Write down the class boundaries and class marks of the following distribution:

Class interval	237–239	240–242	243–245	246–248
Frequency	2	8	14	19

11. (a) The distribution of marks in an examination was as under for the candidates appearing thereat:

35	76	49	25	67	34	43	51	38	21	62	16	37
55	48	72	20	40	38	56	25	39	58	33	68	59
44	32	41	60	52	23	37	42	47	27	38	50	36
44	41	20	18	54	39	51	47	35	39	62	30	49

Construct a frequency table from the above data taking class intervals of 5 marks beginning with the interval 11–15.

(b) Following are the daily wages (in ₹) of 30 workers in a factory:

60	45	41	32	47	45	50	37	53	17
26	39	59	68	44	12	30	25	36	18
40	62	46	29	32	54	41	14	32	30

Make a frequency distribution taking class intervals of ₹10 and find the mean of the distribution. [C.U. B.Com. 1996]

[Hints: See worked-out Ex. 5 in Section 2.8.]

12. (a) Given below are the records of maximum temperature (in centigrade) at 47 selected stations in India during 24 hours preceding 8.30 a.m. (IST) on the 19th June, 2012:

39	39	39	28	35	32	18	37	18	35
33	36	42	39	22	35	28	37	35	30
39	24	36	22	35	27	34	33	33	
38	29	33	35	28	35	35	27	35	
40	33	39	41	37	35	37	23	37	

Construct a frequency distribution taking the lowest class interval as 16–20.

(b) If the class marks of a frequency distribution be 5.5, 15.5, 25.5, 35.5 and 45.5, find the class limits of the distribution.

13. (a) Marks obtained by 50 boys of a class are:

32	45	20	39	52	15	55	30	18	72
10	45	34	50	28	42	71	17	40	35
12	39	44	58	16	21	61	39	21	10
48	63	25	15	51	68	47	15	10	59
34	55	28	14	31	47	19	40	49	58

Construct a frequency table with class intervals 10–19, 20–29, 30–39 and so on.

(b) The monthly salaries of 20 employees are as follows (in ₹):

130	62	145	95	116	100	103	71	76	151
142	110	98	85	80	122	132	118	125	95

Form a frequency distribution with 5 classes of equal intervals.

[C.U. B.Com. 2002]

[Hints:

Classes	62–79	80–97	98–115	116–133	134–151	Total
Frequency	3	4	4	6	3	20

]

(c) The weights (in kg) of 50 persons are given below:

53	46	47	55	48	43	52	64	65	56
55	51	65	67	74	61	62	71	55	67
64	76	60	44	64	69	42	63	46	78
52	66	56	73	46	61	72	67	75	77
63	72	53	55	72	58	43	58	48	64

Construct a frequency distribution table in class interval of length 5 kg.

14. (a) The distribution of marks in an examination was as under for the candidates appearing thereat.

43	41	62	47	49	53	51	45	66	23	72
31	62	26	34	76	49	25	67	34	43	51
38	21	11	16	18	32	48	72	20	25	28
38	12	31	19	45	53	40	13			

Construct a frequency distribution with a class interval of 10 marks.

(b) From the following data of marks obtained by the students, form a frequency distribution table of eight class intervals by tally marks:

17	81	60	25	50	33	53	48	57	81
65	58	28	37	42	71	78	89	43	47
11	58	26	23	82	73	22	44	31	58
14	75	16	83	24	36	35	47	40	76
39	37	27	49	56	77	81	20	45	19

15. Given below are the marks obtained by a batch of 84 students at the IA Examination, 2011 of the Calcutta University:

34	43	32	57	35	71	65	10	52	19	48	17	24	43
65	40	54	62	44	0	13	18	49	57	21	64	71	32
21	52	40	35	57	43	45	44	55	39	37	19	14	45
17	51	35	27	47	22	0	22	15	0	23	35	0	31
21	52	48	0	22	12	12	15	40	39	30	42	27	17
4	19	0	30	6	19	31	25	33	22	51	68	42	66

Construct a frequency distribution with a class interval of 10 marks.

16. The weights in pounds of 50 persons are given below:

160	155	178	90	101	105	124	118	126	176
135	157	134	99	112	115	104	108	178	159
175	147	129	117	128	151	140	169	120	165
98	107	119	93	170	144	154	164	174	160
95	105	113	123	138	168	172	149	179	97

Arrange the above in a frequency distribution consisting of 9 class intervals.

Draw up the cumulative frequency distributions both from below and from above, and also, the percentage frequency distribution from the distribution so constructed.

17. The following table gives the scholastic aptitude scores of the 50 departmental students of a certain department in a certain university:

345	530	556	354	590	472	475	610	586	523
395	515	479	494	420	691	520	465	468	545
563	444	629	440	485	624	582	570	578	505
505	604	490	445	605	523	575	420	605	527
402	406	730	506	516	461	440	585	420	384

Construct a frequency distribution table with appropriate class limits and class boundaries. (Take the length of the class equal to 30 units.)

18. The following are the marks obtained by 50 boys:

7	18	37	53	24	39	41	23	64	67
68	40	93	43	11	27	68	72	19	12
21	19	32	75	52	84	15	11	23	19
52	29	92	79	45	81	63	36	21	33
53	8	41	14	26	26	33	49	40	19

(a) Construct a frequency distribution with a class interval of 10. Also obtain cumulative frequency distribution, (b) from above and (c) from below.

19. Monthly incomes of 40 workers in a factory in ₹ are as under:

120	121.2	122.5	100.2	101.5	102	103	130	139	142.4
150	157	160	100	105.6	108	175	165	166	189
146	100	102	100.5	165	139	188	192	190.2	155
130	142.4	123	124	185	189	170	180	160.2	157

(a) Construct a frequency table with class intervals in the fashion 100 and under 110, 110 and under 120; 120 and under 130, and so on. Also obtain cumulative frequency distribution, (b) from above and (c) from below.

20. Construct a blank table showing the total population of India (2012 census) classified according to

(a) Sex;

(b) Age-groups (years) 0–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75 and over;

(c) Civil condition — Married, Unmarried, Widowed or Divorced.

21. Present in a tabular form with suitable title, captions, etc. the information contained in the following.

In 1995, out of a total of 1750 workers in a factory 1200 workers were members of a Trade Union. The number of women employed was 200 of which 175 did not belong to a Trade Union. In 2000, the number of union workers increased to 1580 of which 1290 were men. On the other hand, the number of non-union workers fell down to 208 of which 180 were men. In 2005, there were on the pay rolls of the factory, 1800 employees who belonged to a Trade Union and 50 who did not belong to a Trade Union. Of all the employees in 2005, 300 were women of whom only 8 did not belong to a Trade Union.

22. Draw up a blank table to show the number of wholly unemployed, temporarily stopped and the total unemployed persons, each class being divided into males and females, for the following industries:

(a) Textile, (b) Tobacco, (c) Footwear, (d) Furniture and fixture, (e) Paper and paper products, (f) Leather and leather products, (g) Chemicals, (h) Engineering and (i) Transport equipments.