Chapter 3—Graphical descriptive techniques – Nominal data

MULTIPLE CHOICE

1. Which of the following is a graphical technique used to present nominal (categorical) data?

A.	Bar chart.
B.	Pie chart.
C.	A bar chart and/or a pie chart.
D.	None of these choices are correct.

ANS: C   PTS: 1   DIF: Easy   TOP: Graphical techniques to describe nominal data

2. Which of the following best describes a bar chart?

A.	A chart in which vertical bars represent data in different categories.
B.	A circle subdivided into sectors representing data in different categories
C.	A chart in which vertical bars of unequal widths are usually used.
D.	A chart in which vertical bars usually have no gaps between them.

ANS: A   PTS: 1   DIF: Easy   TOP: Graphical techniques to describe nominal data

3. Which of the following best describes a component bar chart?

A.	A component bar chart represents all categories within a single bar.
B.	The height of each component is proportional to the frequency of the category that it represents.
C.	Component bar charts may be used as a comparison of two or more breakdowns as an alternative to using two pie charts.
D.	All of these choices are correct.

ANS: D   PTS: 1   DIF: Moderate   TOP: Selecting the appropriate chart: Which chart is best?

4. Which of the following statements about pie charts is false?

A.	Pie charts can only be used for nominal data.
B.	Pie charts are usually used to display the relative sizes of categories for qualitative data.
C.	Pie charts always have the shape of a circle.
D.	The area of each slice of a pie chart is proportional to the relative frequency of the corresponding category.

ANS: A   PTS: 1   DIF: Moderate   TOP: Selecting the appropriate chart: Which chart is best?

5. Which of the following statements is true?

A.	All calculations are permitted on nominal (categorical) data.
B.	A contingency table lists the counts of each combination of the values of the two variables.
C.	Bivariate refers to the distribution of one variable.
D.	A contingency table cannot be based on two nominal variables.

ANS: B   PTS: 1   DIF: Moderate   TOP: Describing the relationship between two nominal variables

1

7. Which of the following statements is true?

A.	A contingency table may also be called a cross classification table
B.	A contingency table is used to describe two nominal variables.
C.	A bar chart may be used as a graphical display of a contingency table.
D.	All of these choices are correct.

ANS: D   PTS: 1   DIF: Moderate   TOP: Describing the relationship between two nominal variables.

TRUE/FALSE

1. A bar chart is a graphical display of a nominal (categorical) variable. The reason for the gaps between the bars is to emphasise that the bars can be placed in any order as the variable is categorical.

   ANS: T   PTS: 1   DIF: Easy   TOP: Graphical techniques to describe nominal data

2. A pie chart is always preferable to a bar chart, when describing a nominal variable.

   ANS: F   PTS: 1   DIF: Moderate   TOP: Selecting the appropriate chart: Which chart is best?

3. When a comparison of two breakdowns is desired, component bar charts offer a good alternative to using two pie charts.

   ANS: T   PTS: 1   DIF: Moderate   TOP: Selecting the appropriate chart: Which chart is best?

4. The wedges of a pie chart, if displayed as proportions, will sum to 1 or 100%.

   ANS: T   PTS: 1   DIF: Moderate   TOP: Graphical techniques to describe nominal data

5. If the focus is to compare the size or frequency of various categories, a bar chart may be appropriate. Pie charts are effective whenever the objective is to display the components of a whole entity in a manner that indicates their relative sizes.

   ANS: T   PTS: 1   DIF: Moderate   TOP: Selecting the appropriate chart: Which chart is best?

SHORT ANSWER

1. Identify the type of data for which each of the following graphs is appropriate.
   a. Pie chart.
   b. Bar chart.

   ANS:
   a. Nominal (categorical) or ordinal data

b. Nominal (categorical), ordinal or numerical (quantitative).

PTS: 1   DIF: Easy   TOP: Selecting the appropriate chart: Which chart is best?

2. Voters participating in a recent election exit poll in a Queensland electorate were asked to state their political party affiliation. Coding the data 1 for Coalition, 2 for minor parties and 3 for Labor, the data collected were as follows:
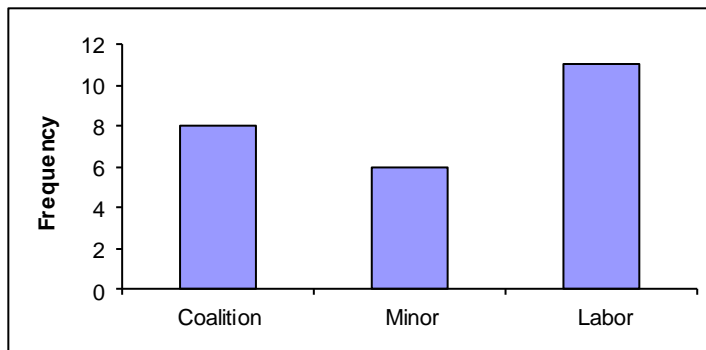
3	1	2	3	1	3	3	2	1
3	3	2	1	1	3	2	3	1
3	2	3	2	1	1	3		

Create a bar chart to display the political party affiliation in the Queensland electorate. Write a short sentence to describe the political affiliation.

ANS:

Party	Frequency	Proportion
Coalition	8	0.32
Minor	6	0.24
Labor	11	0.44

Labor is stronger in the Queensland electorate than the Coalition and minor parties.
Bar chart:

PTS: 1   DIF: Moderate   TOP: Graphical techniques to describe nominal data

3. Car buyers were asked by a car dealer to rate their level of satisfaction with the service they had received. The four ratings were Excellent (E), Good (G), Satisfactory (S) and Unsatisfactory (U). The following data were obtained.
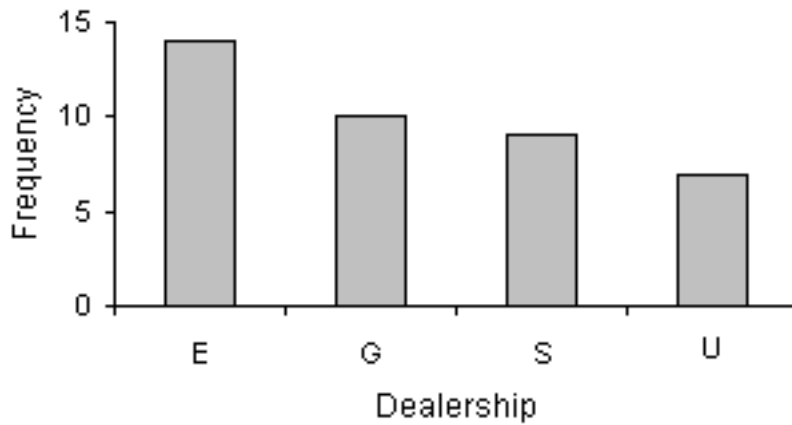
a. Create a bar chart of the level of satisfaction with the service.
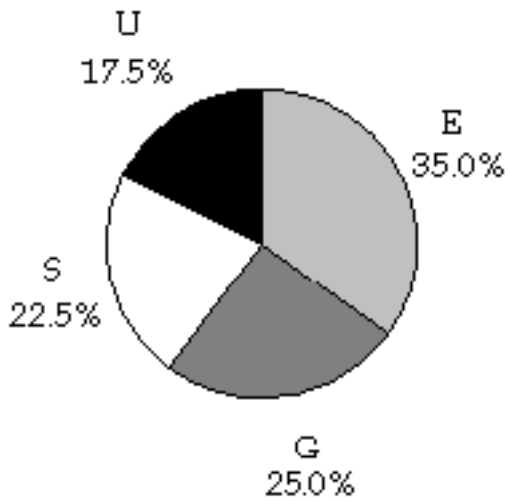b. Create a pie chart of the level of satisfaction with the service.

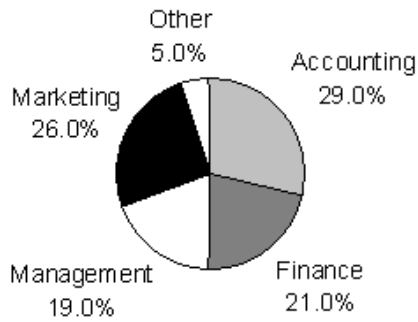| S	E	E	E	U	E	G	S	E	U
U	G	E	G	S	E	G	G	E	G
S	E	E	S	U	G	G	E	E	S
S	U	E	U	S	G	G	E	U	S

ANS:
a.

b.

PTS: 1   DIF: Moderate TOP: Graphical techniques to describe nominal data

4. Construct a pie chart for the sample of 200 business school graduates is shown in the following table.

Major of graduates	Number of graduates
Accounting	58
Finance	42
Management	38
Marketing	52
Other	10

ANS:

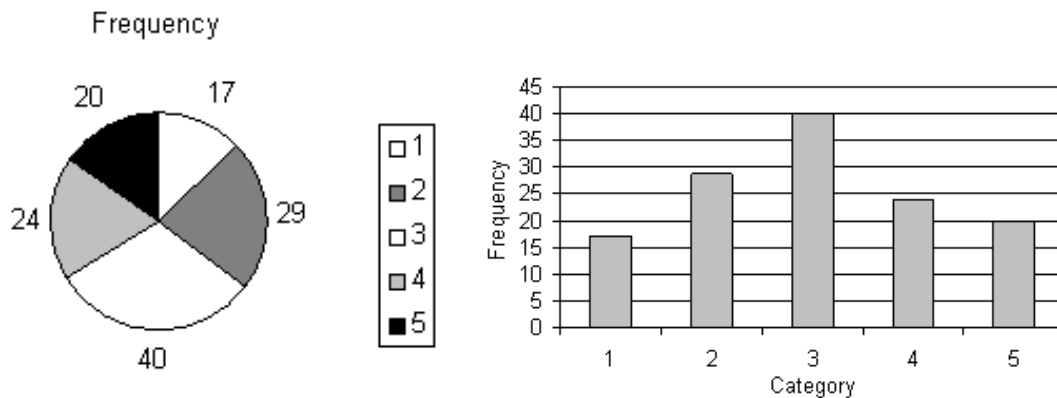| Major of graduates	Proportion of graduates
Accounting	0.29
Finance	0.21
Management	0.19
Marketing	0.26
Other	0.05
Total	1.00

PTS: 1   DIF: Moderate TOP: Graphical techniques to describe nominal data

5. Given the following five categories and the number of times each occurs, construct a pie chart and a bar chart.

Category	1	2	3	4	5
Frequency	17	29	40	24	20

ANS:

PTS: 1   DIF: Moderate TOP: Graphical techniques to describe nominal data

6. Voters participating in a recent election exit poll in a Queensland electorate were asked to state their political party affiliation as well as their gender. Coding the data 1 for Coalition, 2 for minor parties and 3 for Labor, and F for female, M for male.

3M	1F	2F	3M	1F	3M	3F	2F	1F
3F	3M	2F	1M	1M	3M	2F	3M	1M
3M	2F	3F	2F	1F	1F	3M		

a. Create a cross classification table of gender by political affiliation.
b. Create a component bar chart, for each gender.
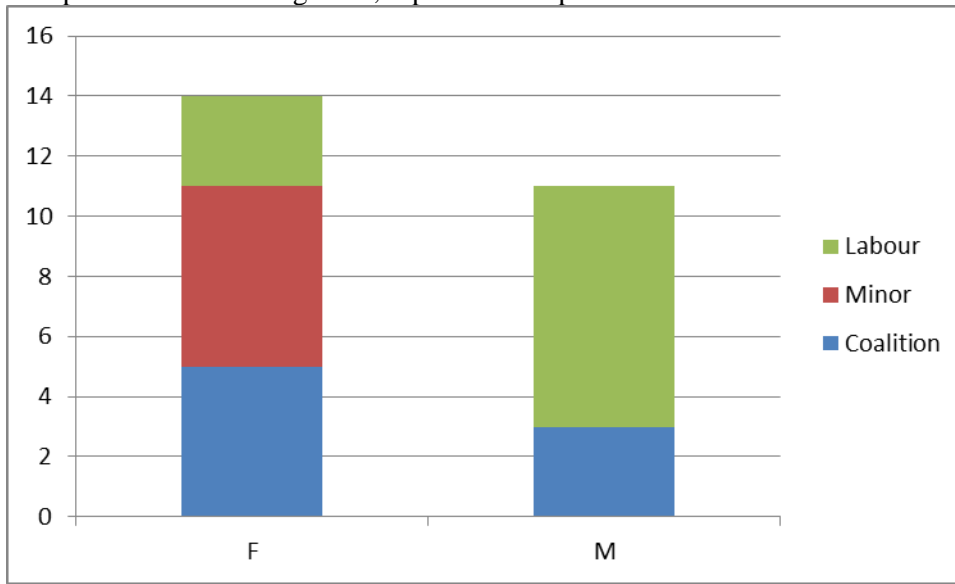c. Interpret your component bar chart by gender.

ANS:
a.

		Gender		
		F	M	Total
Political	Coalition	5	3	8
affiliation	Minor	6	0	6

5

Labour	3	8	11
	14	11	25

b.
Component bar chart of gender, separated into political affiliation.

c. In this sample, females have a greater spread of political affilation between labour, coalition and the minor parties, with the minor parties having a slight majority. Whereas, males in this sample had a higher political affilation with Labour and none with the minor parties.

PTS: 1   DIF: Difficult   TOP: Graphical techniques to describe nominal data