Multiple-choice section – choose the correct answer

Question 1 [8.1]

Which of the following surveys could be carried out by observation?

A The age, in years, of each person in the train carriage

B The proportion of students in your class who were born interstate

C The number of Ford cars in the car park at your school

D The level of support for a proposed change to the school uniform

Question 2 [8.2]

6, 4, 8, 3, 1, 2

The mean and median, respectively, of the set of six data is:

A 4.8, 3.5

B 4, 5.5

C 4.8, 5.5

D 4, 3.5

Question 3 [8.3]

The class centre for a class interval of 20−29 is:

A 24.5

B 25

C 25.25

D 25.5

Question 4 [8.5]

A jar contains 6 red beads, 5 blue beads, 7 orange beads and 3 black beads. The probability that a bead randomly drawn from the jar is not blue is:

A 

B 

C 

D 

Question 5 [8.5]

A die was rolled 30 times. The table shows the frequency of each number rolled.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Face | 1 | 2 | 3 | 4 | 5 | 6 |
| Frequency | 7 | 3 | 4 | 5 | 6 | 5 |

The relative frequency of a 3 was:

A 

B 

C 

D 4

Question 6 [8.6]

A bowl contains 30 identical balls numbered 1 to 30. A ball is drawn at random from the bowl. The probability that the number on the ball is a multiple of 4 and a multiple of 6 is:

A 

B 

C 

D 

Question 7 [8.7]

Sheldon has cereal for breakfast every day. Each day he randomly selects from the six different cereals on his shelf. The probability that Sheldon has *Korny Kobs*, one of the cereals on the shelf, two days in a row is:

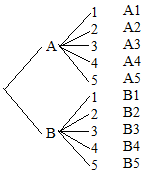
A 

B 

C 

D 

Question 8 [8.7]



For the tree diagram above the probability of A with an even number or B with an odd number is:

A 

B 

C 

D 

Multiple-choice results: \_\_\_ / 8

Short answer section

Question 9 3 marks [8.2, 8.4, 8.7]

categorical data certain chance continuous data discrete data

impossible random sample skewed symmetrical

Complete the following using words from the list above.

(a) An event for which the probability is 1 is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

(b) The number of brothers and sisters you have is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(c) If a statistical graph is not symmetrical it is said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Question 10 2 marks [8.2]

Explain why your weight is considered to be continuous data rather than discrete even though you record it as 52 kg, 55 kg, etc.

Question 11 5 marks [8.2]

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | *x* | *f* | B | *x* | *f* | C | *x* | *f* |
|  | 30  31  32  33  34 | 3  5  10  5  3 |  | 15  16  17  18  19  20 | 10  15  8  3  1  2 |  | 48  49  50  51  52  53 | 6  5  8  14  20  10 |

(a) For which set of data above is the mean equal to the median?

(b) Which two sets of data have the same range?

(c) For the set of data with a positive skew, find the mean and median.

|  |  |  |
| --- | --- | --- |
| *x* | *f* | *x* × *f* |
|  |  |  |
|  |  |  |

Question 12 7 marks [8.3]

The following frequency table shows the distance thrown, in metres, by the students in the javelin competition at the Annual Athletics Carnival.

|  |  |
| --- | --- |
| Distance (m) | Frequency |
| 0−<10 | 4 |
| 10−<20 | 12 |
| 20−<30 | 24 |
| 30−<40 | 9 |
| 40−<50 | 1 |

(a) Calculate an estimate for the mean distance thrown by the competitors.

(b) Draw a histogram and use its shape to describe the data set.

Question 13 2 marks [8.5]

Rhonda and Michelle like playing chess online. Michelle has won 15 of the last 25 games played.

(a) Estimate the probability that the next game is won by Rhonda. Write your answer as a percentage.

(b) How many of the next eight games will Michelle expect to win?

Question 14 3 marks [8.5]

A box of coloured lollies contains 10 red, 12 orange, 6 pink and 4 brown.

(a) If a lolly is chosen at random, what is the probability that it is neither red nor pink?

(b) If 8 lollies are chosen at random, how many would you expect to be pink or brown?

Question 15 6 marks [8.6]

The 22 students in your class were asked the following questions:

* Do you have a TV in your bedroom?
* Do you ride a bicycle regularly?

In summary: 7 have a TV in their room, 10 ride a bicycle regularly and 7 do neither of these.

(a) Complete the two-way table for the 22 people.

|  |  |  |  |
| --- | --- | --- | --- |
|  | TV in bedroom | No TV |  |
| Ride bicycle |  |  |  |
| No riding |  |  |  |
|  |  |  | 22 |

(b) If one of the members of your class was selected at random what is the probability that the person:

(i) has a TV in their bedroom

(ii) has a TV in their bedroom and regularly rides a bicycle

(iii) does not regularly ride a bicycle?

**(c)** If you know the person chosen regularly rides a bicycle, what is the probability they have a TV in their bedroom?

Question 16 9 marks [8.6]

A bowl contains 26 small identical tiles each marked with a different letter of the alphabet. The following sets have been defined.

*A* = ‘vowels’ *B* = ‘consonants’ *C* = ‘a, b, c, d, e, f’ *D* = ‘q, w, e, r, t, y, u, i, o, p’

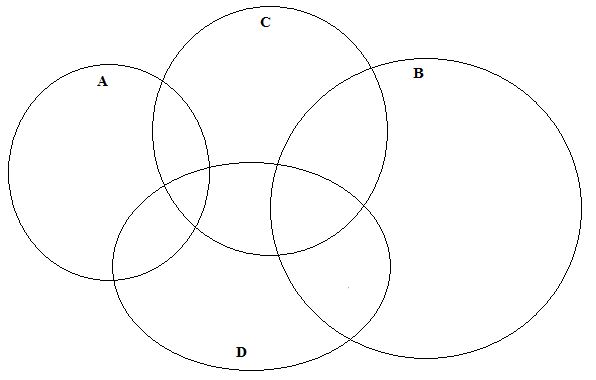
(a) State whether or not each of the following pairs of sets are mutually exclusive.

(i) *A* and *B*

(ii) *A* and *C*

(iii) *A* and *D*

(b) Complete the Venn diagram by writing all the letters of the alphabet in the correct regions.



(c) If one tile is drawn at random, what is the probability that it will belong to group:

(i) *A*

(ii) *B* and *C*

(iii) *C* or *D*

(iv) *A* and *B*?

Question 17 8 marks [8.7]

A bowl contains three red marbles, two yellow marbles and four blue marbles. Two marbles are drawn from the bowl without replacement.

(a) Write out the sample space, making sure you distinguish between the marbles of the same colour.

Use the sample space to find the probability that:

(b) both marbles are red

(c) both marbles are the same colour

(d) neither marble is blue

(e) one marble is blue and the other is yellow.

Question 18 5 marks [8.3]

A particular data set has the following characteristics.

mode = 41

mean = 32

median = 37.5

(a) Describe this data set in terms of its skew.

(b) Write out a data set with 16 values that has these characteristics.

Short answer results: \_\_\_ / 50

Extended answer section

Question 19 18 marks [8.4]

The following lists are of heights, in cm, of 30 Year 9 students from each of NSW and Victoria recorded in a particular year.

NSW students:

164 160 167 164 176 156 188 164 166 174 179 167

142 148 175 126 155 150 173 179 146 182 152 160

170 172 162 174 182 152

Victoria students:

167 164 166 186 167 165 182 161 177 157 161 162

165 165 172 166 167 178 160 160 167 174 175 164

167 175 159 168 162 174

(a) Find the mean height for the students from each state. Give answers correct to 1 decimal place if necessary.

(b) Draw a back-to-back stem-and-leaf plot of the data. Use a class interval of 5 (i.e. 15L and 15H).

(c) Draw a second back-to-back stem-and-leaf plot using a class interval of 10.

(d) Find the median height and range of heights for the students from each state.

(e) What conclusions can you draw from the stem-and-leaf plot and the statistics calculated regarding the height of Year 9 students from NSW compared to those from Victoria? Did the different sized class interval make any difference to your conclusions?

(f) Estimate the mean, median and range of heights of Year 9 students for the whole of Victoria and NSW combined. Explain any assumptions you made and any limitations (e.g. time of the year) for your estimated values.

Question 20 18 marks [8.3, 8.5]

Up until December 2015 Usman Khawaja had batted 22 times for Australia in Test Cricket. These are his scores:

37 21 21 26 13 12 65 38 0 7 23

14 54 1 24 0 21 174 9 121 144 56

(a) Find the mean, median and range of these scores. Round the mean correct to one decimal place.

(b) Now construct a frequency table, using 0−19 as the first score interval, and use the frequency table to find an estimate for the mean. Write your answer correct to one decimal place if necessary.

(c) Compare the two values for the mean you have found, discussing any concerns you might have regarding grouping data as opposed to dealing with raw data.

(d) If one of Usman’s test innings was chosen at random find Pr(score is under 10). Write all probabilities as percentages to the nearest whole number.

(e) If the innings with scores under 10 were left out, what is the mean number of runs for the remaining innings?

(f) If one of Usman’s test innings was chosen at random find **(i)** Pr(at least 50) and **(ii)** Pr(at least 100).

(g) If Usman was to reach 50 in a subsequent innings what are his chances of going on to make 100?

Extended answer results: \_\_\_ / 37

TOTAL test results: \_\_\_ / 95