6.2 Collecting Data, Tally and Frequency Tables: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State whether each of these is qualitative or quantitative data.

(a) The colour of cars parked in a street. **(1)**

(b) The number of books each pupil has read this term. **(1)**

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2 Here is a tally chart showing favourite school subjects for 12 pupils. Convert the tally chart into a frequency table.
Maths: ||||, English: |||, Science: ||, History: ||, Art: |.

(a) Write the frequency table with the totals. **(3)**

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3 A survey records the shoe colour of 9 pupils: black, brown, black, blue, black, brown, black, blue, black.

(a) Make a tally chart and frequency table for black, brown and blue. **(1)**

(b) Which colour is most common? **(1)**

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4 A questionnaire asked 40 pupils how many games consoles they have at home. The grouped frequency table is:
0-1: 18, 2-3: 14, 4-5: 8.

(a) Complete the cumulative frequency column, filling the groups in order. **(2)**

(b) Use the cumulative frequency to estimate the number of pupils with fewer than 3 consoles. **(2)**

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5 A tally chart records the number of siblings pupils have: tallies shown for categories 0, 1, 2, 3 as ||, ||||, |||, |. Write the frequencies for each category.

(a) Frequencies for 0, 1, 2, 3. **(2)**

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6 Stretch: A teacher records the number of times 25 pupils visited a museum: grouped table 0-1: 9, 2-3: 10, 4-5: 6.

(a) Calculate the cumulative frequency table. **(2)**

(b) Use the cumulative frequency to find the median group and explain why this group contains the median pupil. **(2)**

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7 Stretch: A teacher collected the time (minutes) pupils spent on a club each week and grouped them: 0-9 (8 pupils), 10-19 (12 pupils), 20-29 (5 pupils). Estimate the median time in minutes by assuming uniform distribution within the median group. Show working and give your answer to the nearest minute.

(a) Estimate the median time and give your answer to the nearest minute. **(3)**

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8 A school has 180 pupils in Year 7, 240 in Year 8 and 120 in Year 9. A stratified sample of 60 pupils is taken. How many Year 7 pupils should be in the sample?

(3)

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9 The scores of 17 players in a game are: 18, 19, 23, 15, 10, 14, 19, 12, 14, 12, 23, 23, 21, 17, 19, 13, 19.
Complete a grouped frequency table using the class intervals 10 to 14, 15 to 19 and 20 to 24.

(3)

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10 The table shows shoe sizes of 10 pupils. Complete the tally column and the frequency column.
Sizes: 2, 3, 3, 4, 2, 5, 3, 4, 2, 3. Categories: 2, 3, 4, 5.

(a) Tally and frequency for each size **(3)**

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11 Give one advantage and one disadvantage of using tally marks when collecting data in class.

(a) Give one advantage. **(1)**

(b) Give one disadvantage. **(1)**

12 Hamza wants to find the mean number of hours of sleep of pupils at a school of 930 pupils. He asks the 14 members of the school football team. Give a reason why this might not give a reliable answer.

(2)

13 A survey asked 30 pupils which fruit they prefer. The frequency table below is partly completed.
Fruit: Apple, Banana, Orange, Grapes. Frequencies: Apple 12, Banana 6, Orange ?, Grapes 5. Total 30.
Find the frequency for Orange.

(a) Work out the missing frequency for Orange. **(2)**

(b) Explain briefly how you found the answer. **(1)**

14 The numbers of pets owned by 16 pupils are: 5, 2, 5, 3, 4, 4, 6, 3, 6, 2, 2, 2, 4, 4, 2, 2.
Complete a frequency table to find how many pupils own 5 pets.

(2)

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15 A teacher records how many minutes pupils spend reading each night. The data for 8 pupils is: 10, 15, 20, 15, 25, 10, 30, 20.

(a) Draw and complete a frequency table for these exact values: 10, 15, 20, 25, 30. **(2)**

(b) What is the mode of the data? **(1)**

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16 The heights (cm) of 7 plants are grouped: 10-14, 15-19, 20-24. The frequencies are 3, 2, 2 respectively.
Write down which group contains the median plant height.

(a) Find the median group. **(2)**

(b) Explain your working briefly. **(1)**

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Mark scheme · 6.2 Collecting Data, Tally and Frequency Tables: Test Pack

Question 1

(a) qualitative cao **B1**

(a) Answer: **Qualitative**

(b) quantitative cao **B1**

(b) Answer: **Quantitative**

Question 2

(a) correct conversion of tallies to numbers **M1**

(a) correct frequencies: Maths 4, English 3, Science 2, History 2, Art 1 **M1**

(a) total 12 cao **A1**

(a) Answer: **Maths 4, English 3, Science 2, History 2, Art 1; total 12**

Question 3

(a) correct tallies and frequencies e.g. black: ||||| frequency 5; brown: || frequency 2; blue: || frequency 2 **M1**

(a) Answer: **Black: tally ||||| freq 5; Brown: tally || freq 2; Blue: tally || freq 2**

(b) black cao **B1**

(b) Answer: **Black**

Question 4

(a) correct cumulative method shown **M1**

(a) cumulative 0-1:18, up to 2-3:32, up to 4-5:40 cao **A1**

(a) Answer: **Cumulative frequencies: 0-1 = 18; 0-3 = 32; 0-5 = 40**

(b) method: use cumulative frequency up to 2-3 and consider fewer than 3 implies up to 2 **M1**

(b) 18 + estimate half of 14 = 25 cao (accept 25 if method stated) **A1**

(b) Answer: **25**

Question 5

(a) correct conversion from tallies **M1**

(a) frequencies 0:2, 1:4, 2:3, 3:1 cao **A1**

(a) Answer: **0:2, 1:4, 2:3, 3:1**

Question 6

(a) correct cumulative method **M1**

(a) cumulative 0-1:9, up to 2-3:19, up to 4-5:25 cao **A1**

(a) Answer: **Cumulative: 0-1 = 9; 0-3 = 19; 0-5 = 25**

(b) correct median position: (25+1)/2 = 13th **M1**

(b) median group 2-3 and explanation that 13th lies in cumulative to 19 (2-3 group) cao **A1**

(b) Answer: **Median group: 2-3; the 13th pupil lies within the cumulative count up to 19 which is the 2-3 group**

Question 7

(a) find median position: (25+1)/2 = 13th and cumulative frequencies showing median group 10-19 **M1**

(a) use linear interpolation within 10-19: position of 13th within group = 13 - 8 = 5 out of group size 12 **M1**

(a) median approx = 10 + (5/12)*10 = 14.17 -> 14 minutes cao **A1**

(a) Answer: **14**

Question 8

total 540 **M1**

180/540 x 60 **M1**

20 cao **A1**

Answer: **20**

Question 9

tally or count of at least one class **M1**

two frequencies correct **A1**

10 to 14: 6, 15 to 19: 7, 20 to 24: 4 cao **A1**

Answer: **10 to 14: 6, 15 to 19: 7, 20 to 24: 4**

Question 10

(a) correct tallies shown: 2 -> |||, 3 -> ||||, 4 -> ||, 5 -> | **M1**

(a) frequencies 2:3, 3:4, 4:2, 5:1 cao **A1**

(a) total frequency = 10 cao **A1**

(a) Answer: **2: tally ||| frequency 3; 3: tally |||| frequency 4; 4: tally || frequency 2; 5: tally | frequency 1**

Question 11

(a) e.g. quick to add marks when observing responses or easy to keep running count **B1**

(a) Answer: **Quick to use in real time so counts can be recorded easily**

(b) e.g. can become messy or hard to read if many marks, or not useful for calculation without conversion **B1**

(b) Answer: **Can become messy and hard to count if there are many items**

Question 12

identifies that the sample is not random or not representative **M1**

only footballers are asked, who may sleep differently, and the sample is small relative to the school **A1**

Answer: **The sample is not representative of all pupils**

Question 13

(a) method: 30 - (12 + 6 + 5) or equivalent **M1**

(a) 7 cao **A1**

(a) Answer: **7**

(b) subtraction from total or explanation of missing part of total **B1**

(b) Answer: **I added the known frequencies and subtracted from 30 to find the missing number**

Question 14

systematic counting or a tally of the data **M1**

2 cao **A1**

Answer: **2**

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Question 15

(a) correct frequencies shown e.g. 10:2, 15:2, 20:2, 25:1, 30:1 **M1**

(a) total 8 cao **A1**

(a) Answer: **10:2, 15:2, 20:2, 25:1, 30:1**

(b) mode is 10, 15 or 20 (all have highest frequency 2) with explanation or any one listed **B1**

(b) Answer: **Mode: 10, 15 and 20 (three modes)**

Question 16

(a) method: cumulative frequencies and position of median (7 pupils -> median is 4th) **M1**

(a) 15-19 group cao **A1**

(a) Answer: **15-19**

(b) explanation identifying median position (4th) and showing it lies in the 15-19 group **B1**

(b) Answer: **Median is the 4th value; cumulative counts show 10-14 gives first 3, so the 4th is in 15-19**

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