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| *School Name*  *Mathematics Test 2017* | | | |
| Year 7 | | *Data Collection and Representation* | Non Calculator  Section |
| **Skills and Knowledge Assessed:**   * Investigate techniques for collecting data, including census, sampling and observation (ACMSP284) * Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206) * Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169) * Construct and compare a range of data displays including stem- and - leaf plots and dot plots (ACMSP170) | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Answer all questions in the spaces provided on this test paper by:  *Writing the answer in the box provided.*  or  *Shading in the bubble for the correct answer from the four choices provided.*  Show any working out on the test paper.Calculators are **not** allowed in this section.  **You will need a ruler and protractor.** | | | |
|  | **Questions 1 – 4 refer to the following.** | | |
|  | How many votes did Lisa get? | | |
|  | How many votes were cast altogether? | | |
|  | What number of votes were received by two candidates?  12 15 20 28 | | |
|  | How many candidates got more than 18 votes?  1 2 3 4 | | |
|  | Which of these situations would be suitable to use a census to collect the data?  Predicting the result of a federal election.  Publishing the ratings of television programs.  Producing a list of the top selling music tracks in a given week.  Electing the Class Captain from a year 7 class. | | |
|  | For which of the following could the data be collected by observation?  The colours of the pets that are exercised in a park.  The favourite colours of the members of a club.  The heights of students in a year 7 class.  The opinions of people about transport in a city. | | |
|  | **Question 7 – 10 refer to the graph below.** | | |
|  | What was the temperature at 4 pm on this day? | | |
|  | At what time(s) was the temperature 8o C? | | |
|  | How many times during the day was the temperature 12o C?  1 2 3 4 | | |
|  | What was the difference between the maximum and minimum temperatures on the day?  29o C 30o C 31o C 32o C | | |
|  | Which of the following types of graph would be suitable to show the proportion of students who have different coloured eyes?  Frequency Histogram Line Graph  Sector graph Stem and Leaf plot. | | |
|  | **Questions 12 – 16 refer to the following**:    The divided bar graph shows the region of origin of the 50 movies that played at the Moondance Film Festival. | | |
|  | Which region produced the most movies at the festival?  Asia Australia  United Kingdom USA | | |
|  | Which regions produced more movies than Asia but less than the USA?  and | | |
|  | What fraction of the movies were produced in Europe? | | |
|  | Which country produced  of the movies?  Asia Australia  United Kingdom USA | | |
|  | How many of the 50 movies were made in Other regions? | | |

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| *School Name*  *Mathematics Test 2017* | | | |
| Year 7 | | *Data Collection and Representation* | Calculator Allowed  Short Answer  Section |
|  | | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Answer all questions in the spaces provided on this test paper by:  *Writing the answer in the box provided.*  or  *Shading in the bubble for the correct answer from the four choices provided.*  Show any working out on this test paper. Calculators are allowed. | | | |
|  | Angela is a researcher who wants to collect data on the heights of people in Australia.  Which would be a practical way of conducting his research?  Measuring every person in Australia.  Measuring every person in South Australia.  Sending a survey form to every person in Australia, asking their height.  Sending a survey form to 100 people from all around Australia, asking their height. | | |
|  | Sandra records the preferred political party of voters a week before an election.  Which type of graph would **not** be suitable to represent this information?  Column Graph. Divided bar Graph.  Line Graph. Sector Graph. | | |
|  | Question 3 - 6 refer to the dot plot below.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  | Ancestry Search | | | | | | |  | |  | |  | ● |  |  |  |  |  |  |  | |  |  | ● | ● |  |  |  |  |  |  |  | |  |  | ● | ● | ● |  |  |  |  |  |  | |  |  | ● | ● | ● | ● |  |  |  |  |  | |  | ● | ● | ● | ● | ● | ● |  |  |  |  | |  | ● | ● | ● | ● | ● | ● | ● | ● |  |  | |  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |  |  | |  |  |  | **Number of Generations Found** | | | | | | |  |   The plot shows the number of generations of ancestors that the students in a class had found during an assignment on ancestry. | | |
|  | How many students found exactly 6 generations of ancestors? | | |
|  | What number of generations was found by 5 students? | | |
|  | What fraction of the students found exactly 4 generations of ancestors? | | |
|  | What fraction of the students found more than 6 generations of ancestors? | | |
|  | **Question 7-10 refer to the stem and leaf plot below.**  Number of Passengers on 30 Buses.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |  | Stem | Leaves | | | | | | | | |  | 0 | 3 | 4 | 4 | 5 | 6 | 7 | 9 |  | |  | 1 | 2 | 5 | 5 | 5 | 5 | 8 | 9 | 9 | |  | 2 | 0 | 6 | 7 |  |  |  |  |  | |  | 3 | 1 | 3 | 4 | 5 | 6 | 7 |  |  | |  | 4 | 2 | 4 | 6 | 8 | 9 |  |  |  | |  | 5 | 4 |  |  |  |  |  |  |  |   The stem and leaf plot was completed by counting the number of passengers on thirty buses which passed a checkpoint on a highway. | | |
|  | How many buses had 19 passengers? | | |
|  | What was the most common number of passengers? | | |
|  | How many buses had fewer than 20 passengers?  14 15 16 17 | | |
|  | What fraction of buses had more than 40 passengers? | | |
|  | Mark asks 50 people chosen from a town of 10 000 to answer how strongly they agree with questions by rating their agreement on a scale of 1 – 5.  Which is true?  He is using a census to collect continuous numerical data.  He is using a census to collect categorical data.  He is using a sample to collect continuous numerical data.  He is using a sample to collect categorical data. | | |
|  | **Question 12-16 refer to the sector graph below.**  Student’s Holiday Type  A survey of 108 students asked which type of holiday they had most recently experienced.  The sector graph is drawn from the results of the survey. | | |
|  | Which type of holiday was least common? | | |
|  | What fraction of the students had an Adventure holiday? | | |
|  | Which holiday type was taken by  of the students?  Adventure Bus Tour Cruise Resort | | |
|  | How many of the 108 students visited family for their holiday?  27 30 36 39 | | |
|  | What type of data is represented in the graph above?  Categorical Data from observation. Categorical Data from measurement.  Categorical Data from survey responses. Numerical Data from survey responses. | | |

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| *School Name*  *Mathematics Test 2017* | | |
| Year 7 | *Data Collection and Representation* | Calculator Allowed  Longer Answer  Section |
|  | | Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| ***Write all working and answers in the spaces provided on this test paper.***  ***Marks may not be awarded if working out and/or answers are not clear.***  ***Marks allocated are shown beside each question.***  ***Calculators are allowed.*** | | |

|  | | **Marks** |
| --- | --- | --- |
|  | The frequency distribution table records the number of children in 25 families.   |  |  |  |  | | --- | --- | --- | --- | | Score (*x*) | Tally | Frequency (*f*) | (*fx*) | | 1 | ~~IIII~~ ~~IIII~~ |  |  | | 2 | ~~IIII~~ III |  |  | | 3 | ~~IIII~~ |  |  | | 4 | II |  |  | |  |  |  |  | |  |
|  | (a) Complete the table, including the column totals. | **4** |
|  | (b) Draw a frequency histogram for the data. | **2** |
|  | (c) What percentage of the families had 3 children?  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **1** |
|  | The Cougars Netball team coach recorded the number of goals that the team scored in each game they played in a season. The results are shown below.     |  |  |  |  |  | | --- | --- | --- | --- | --- | | 29 | 48 | 52 | 35 | 42 | | 30 | 24 | 45 | 38 | 39 | | 9 | 17 | 26 | 36 | 47 | | 48 | 28 | 32 | 34 | 48 | | 56 | 18 | 32 |  |  | |  |
|  | (a) Compile the data above into a stem and leaf plot.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Stem | Leaves | | | | | | | | | 0 |  |  |  |  |  |  |  |  | | 1 |  |  |  |  |  |  |  |  | | 2 |  |  |  |  |  |  |  |  | | 3 |  |  |  |  |  |  |  |  | | 4 |  |  |  |  |  |  |  |  | | 5 |  |  |  |  |  |  |  |  | | **2** |
|  | (b) Would you describe the distribution of scores as being symmetric? Explain your answer.  ……………………………………………………………………………………..  …………………………………………………………………………………….. | **1** |
|  | (c) What score occurred in more games than any other?  …………………………………………………………………………………….. | **1** |
|  | Complete the table and the sector graph below for the results of an election.  A protractor will be needed.   |  |  |  | | --- | --- | --- | | Candidate | Percent | Angle | | Nguyen | 10% | 36° | | Kwong | 45% |  | | Liaw | 20% |  | | Bryant | 25% | 90° | | **4** |

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ANSWERS

| Question | Working and Answer |
| --- | --- |
|  | Lisa got **20 votes** |
|  | 15+20+28+15+12+30 **=120** |
|  | Stevie and Frances both received **15 votes**  **2nd Answer** |
|  | Lisa, Joseph and Jeff , so **3 candidates**  **3rd Answer** |
|  | Electing the representative from a year 7 class could be done by asking every student to vote, which is a census.  **4th Answer**. |
|  | The dog colours could be recorded by observing.  **1st Answer** |
|  | At 4 pm it was **36o C**. |
|  | It was 8o C at **3 am.** |
|  | On three occasions, 1:00 am, 5:30 am and 10:00 pm.  **3rd Answer** |
|  | Maximum Temperature = 38o C  Minimum Temperature = 8o C  Difference = 30o C  **2nd Answer** |
|  | Sector graph is best of these to show proportions as it shows parts of a circle.  **3rd Answer** |
|  | The USA has the longest section of the bar.  **4th Answer** |
|  | **Europe and the United Kingdom** |
|  | Europe had 20 mm section, out of 100 mm long bar. |
|  | of 100 mm = 15 mm  **Asia** has a 15 mm long section.  **1st Answer** |
|  | Other Section = 10 mm |

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ANSWERS

|  |  |
| --- | --- |
| Question | Working and Answer |
|  | Only the last option is practical as she is using a sample.  **4th Answer** |
|  | A line graph is best to represent changing quantities over time, not categorical data.  **3rd Answer** |
|  | 6 generations has 3 dots, so **3 people** |
|  | There are 5 dots on **3 generations.** |
|  | 4 generations has 6 dots, so 6 people out of 24    **4th Answer** |
|  | 7, 8 and 9 generations have 2, 1 and 1 dots respectively, so 4 people out of 24 |
|  | 9 occurs twice on the 1 stem, so **2 buses.** |
|  | 5 occurs four times on the 1 stem, which is more than any other, so the most common number of passengers is **15.** |
|  | All the leaves on the 0 and 1 stems are fewer than 20, so number = 7 + 8 = **15**  **2nd Answer** |
|  | All the leaves on the 4 and 5 stems are more than 40, so number = 5 + 1 = **6**    **3rd Answer** |
|  | He is choosing a sample of 50 from the town  Rating on a scale is categorical data.  **4th Answer** |
|  | Smallest angle is for **Bus Tour** |
|  | Adventure has a 90o angle. |
|  | Measuring, the type with a 60o angle is **Resort.**  **4th Answer** |
|  | Visit Family has a 120o angle.    **3rd Answer** |
|  | The data is names of holiday types so is Categorical.  It comes from survey responses.  **3rd Answer** |

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| *School Name*  *Mathematics Test 2017* | | |
| Year 7 | *Data Collection and Representation* | Calculator Allowed  Longer Answer  Section |

ANSWERS

| Question | Working and Answer | Marks |
| --- | --- | --- |
| 1. | (a)   |  |  |  |  | | --- | --- | --- | --- | | Score (*x*) | Tally | Frequency (*f*) | (*fx*) | | 1 | ~~IIII~~ ~~IIII~~ | 10 | 10 | | 2 | ~~IIII~~ III | 8 | 16 | | 3 | ~~IIII~~ | 5 | 15 | | 4 | II | 2 | 8 | |  |  |  |  | | **4 marks in total for correctly completed table.**  **1 mark for each column and 1 for each total.**  **Do not penalise subsequent errors.** |
|  | (b) | **2 marks for correct and accurate graph**  **1 mark if a minor error or lack of accuracy.** |
|  | (c) | **1 mark for correct answer** |
| 2. | (a)   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Stem | Leaves | | | | | | | | | 0 | 9 |  |  |  |  |  |  |  | | 1 | 7 | 8 |  |  |  |  |  |  | | 2 | 4 | 6 | 8 | 9 |  |  |  |  | | 3 | 0 | 2 | 2 | 4 | 5 | 6 | 8 | 9 | | 4 | 2 | 5 | 7 | 8 | 8 | 8 |  |  | | 5 | 2 | 6 |  |  |  |  |  |  | | **2 marks for correct and accurate plot**  **1 mark if a minor error or lack of accuracy.** |
|  | (b) It is not symmetric as there are more scores at the upper end of the range. | **1 mark for correct answer with some valid description** |
|  | (c) 48 | **1 mark for correct answer** |
| 3. | Complete the table and the sector graph below for the results of an election.  A protractor will be needed.   |  |  |  | | --- | --- | --- | | Candidate | Percent | Angle | | Nguyen | 10% | 36° | | Kwong | 45% | **162°** | | Liaw | 20% | **72°** | | Bryant | 25% | 90° | | **2 marks for completing the two values in the table**  **2 marks for completing the sector graph accurately.**  **1 mark if error made in two sectors or if generally inaccurate but otherwise correct.** |