A screenshot of a cell phone

Description automatically generated

**Foundation Tier**

**Buttons and counters**

**Instructions**

* Use **black** ink or ball-point pen.
  + **Fill in the boxes** at the top of this page with your name,  
    centre number and candidate number.
* Answer **all** questions.
* Answer the questions in the spaces provided  
  *– there may be more space than you need.*
* You must **show all your working.**
* Diagrams are **NOT** accurately drawn, unless otherwise indicated.
* If your calculator does not have a *π* button, take the value of *π* to be3.142

unless the question instructs otherwise.

**Information**

* The total mark for this paper is **26**. There are **8** questions.
* Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
* The marks for **each** question are shown in brackets  
  *– use this as a guide as to how much time to spend on each question.*

**Advice**

* Read each question carefully before you start to answer it.
* Keep an eye on the time.
* Try to answer every question.
* Check your answers if you have time at the end.

**1** There are 49 counters in a bag.

20 of the counters are red.

The rest of the counters are blue.

One of the counters is taken at random.

Find the probability that the counter is blue.

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**(Total for Question 1 is 2 marks)**

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**2** Bill has 400 counters in a bag.

He gives

35 of the counters to Sameena

50 of the counters to Henry

75 of the counters to Lucas

What fraction of the 400 counters is left in Bill’s bag?

Give your fraction in its simplest form.

.......................................................

**(Total for Question 2 is 3 marks)**

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**3** There are four types of counter in a bag.

The table shows the number of each type of counter in the bag.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of counter** | red circle | green circle | red square | green square |
| **Number of counters** | 16 | 26 | 11 | 7 |

There are more green counters than red counters.

How many more?

.......................................................

**(Total for Question 3 is 2 marks)**

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**4** Marla buys some bags of buttons.

There are 19 buttons or 20 buttons or 21 buttons or 22 buttons in each bag.

The table gives some information about the number of buttons in each bag.

|  |  |
| --- | --- |
| **Number of buttons** | **Frequency** |
| 19 | …….......…… |
| 20 | 7 |
| 21 | 3 |
| 22 | 1 |

The total number of buttons is 320.

Complete the table.

(**Total for Question 4 is 3 marks**)

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**5** Here is a probability scale.

It shows the probability of each of the events A, B, C and D.



(*a*)Write down the letter of the event that is certain.

.......................................................

(**1**)

(*b*)Write down the letter of the event that is unlikely.

.......................................................

(**1**)

There are 12 counters in a bag.

3 of the counters are red.

1 of the counters is blue.

2 of the counters are yellow.

The rest of the counters are green.

Caitlin takes at random a counter from the bag.

(*c*)Show that the probability that this counter is yellow or green is 

(**3**)

(**Total for Question 5 is 5 marks**)

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**6** In a bag there are only red counters, blue counters, green counters and yellow counters.

A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Colour** | red | blue | green | yellow |
| **Probability** | 0.4 | ...................... | ...................... | 0.25 |

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

(**Total for Question 6 is 4 marks**)

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**7** There are only red buttons, yellow buttons and orange buttons in a jar.

The number of red buttons, the number of yellow buttons and the number of orange

buttons are in the ratio 7 : 4 : 9

Work out what percentage of the buttons in the jar are orange.

....................................................... %

**(Total for Question 7 is 2 marks)**

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**8** There are some counters in a bag.

The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Colour** | red | white | blue | yellow |
| **Probability** |  |  | 0.45 | 0.25 |

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the

counter will be white.

(*a*)Work out the number of red counters in the bag.

.......................................................

(**4**)

A marble is going to be taken at random from a box of marbles.

The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(*b*)Explain why.

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(**1**)

(**Total for Question 8 is 5 marks**)

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**TOTAL MARKS FOR PAPER: 26**