Probability – PART A

Name: _____

All Multiple Choice

1 The sun will rise today is best described as:
A very unlikely
B certain
C highly unlikely
D impossible

2 The likelihood that every person in the world will become rich is:
A very unlikely
B certain
C highly unlikely
D impossible

3 An example of an event which is highly likely is:
A You will eat breakfast tomorrow.
B The television will stop working.
C You will get a sports scholarship.
D You will be the torch bearer at the next Olympics.

4 The estimated probability of a Tail showing when a coin is tossed is:
A $\dfrac{1}{2}$
B $\dfrac{1}{3}$
C 1
D 0

5 The estimated probability that a standard die will show a 7 when it is rolled is
A $\dfrac{1}{2}$
B $\dfrac{1}{6}$
C 1
D 0

6 A fair coin is tossed 60 times. A Tail comes up 12 times. The relative frequency of a Tail is:
A $\dfrac{1}{6}$
B $\dfrac{1}{5}$
C $\dfrac{1}{4}$
D $\dfrac{1}{2}$

Questions **7** and **8** refer to the following information.
A die is thrown 20 times. The number 3 comes up 6 times.

7 The relative frequency of a 3 coming up is:
A $\dfrac{3}{20}$
B $\dfrac{7}{10}$
C $\dfrac{3}{10}$
D $\dfrac{1}{2}$

8 The relative frequency of not getting a 3 is:
A $\dfrac{3}{20}$
B $\dfrac{7}{10}$
C $\dfrac{3}{10}$
D $\dfrac{1}{2}$

Questions **9** and **10** refer to the following information.

A spinner with 4 equal sections was spun 80 times. The results are as shown.

Score	1	2	3	4
Frequency	11	23	16	30

9 The fraction of spins which resulted in a 3 is:
A $\dfrac{1}{5}$
B $\dfrac{2}{5}$
C $\dfrac{3}{5}$
D $\dfrac{4}{5}$

10 The relative frequency of a 4 expressed as a decimal is:
A 0.2
B 0.375
C 0.0375
D 3.7

11 The sample space of rolling a die is:
A {2, 4, 6}
B {1, 2, 3, 4, 5, 6}
C {1, 3, 5}
D {1, 6}

12 The sample space of tossing a coin is:
A {$\dfrac{1}{2}$}
B {Heads}
C {Tails}
D {Heads, Tails}

13 The sample space of all prime numbers less than 10 is:
A {2, 3, 5, 7}
B {1, 3, 5, 7, 9}
C {1, 2, 3, 4}
D {5, 6, 7, 8}

Questions **14** and **15** refer to the following information.

A bag contains 3 red, 2 black and 7 white marbles. A marble is drawn at random.

14 The chance that the marble will be white is:
A $\dfrac{1}{3}$
B $\dfrac{1}{2}$
C $\dfrac{1}{6}$
D $\dfrac{7}{12}$

15 The chance that the marble will be red or black is:
A $\dfrac{2}{3}$
B $\dfrac{1}{2}$
C $\dfrac{7}{12}$
D $\dfrac{5}{12}$

Questions **16** and **17** refer to the following information.

A spinner has 3 equal sections numbered 1, 2 and 3.

16 The probability of getting a 2 is:

A $\frac{1}{2}$

B $\frac{1}{3}$

C $\frac{2}{3}$

D $\frac{1}{4}$

17 The probability of not getting a 2 is:

A $\frac{1}{2}$

B $\frac{1}{3}$

C $\frac{2}{3}$

D $\frac{1}{4}$

18 The probability of obtaining any element of a sample space when rolling a fair die is:

A $\frac{1}{3}$

B $\frac{1}{2}$

C $\frac{1}{6}$

D 1

19 The sum of the probabilities of all possible outcomes of an event is:

A $\frac{1}{2}$

B $\frac{1}{6}$

C 6

D 1

20 A device to simulate outcomes of choosing 6 equally liked take away foods is:

A tossing a coin

B rolling a die

C spinner with 3 × 120° sections

D rolling a die and ignoring the 6

21 A device to simulate the outcomes of choosing 4 designer jackets which are equally popular is:

A tossing a coin

B rolling a die

C spinner with 3 × 120° sections

D spinner with 4 × 90° sections

22 The complementary event to selecting a number greater than 20 is

A selecting a number less than 20

B selecting a number greater than 21

C selecting a number less than 21

D selecting a number less than 19

Questions **23** and **24** refer to the following information.

A bag contains 5 blue balls, 4 red balls and 9 yellow balls.

23 The complementary event to selecting a blue ball is:

A selecting a red ball

B selecting a yellow ball

C selecting another blue ball

D not selecting a blue ball

24 The probability of not selecting a red ball is:

A $\frac{7}{9}$

B $\frac{1}{2}$

C $\frac{1}{3}$

D $\frac{2}{3}$

25 The probability that a golfer will sink a putt is 0.45. The probability that the golfer will miss the putt is:

A 0.45

B 0.5

C 0.55

D 1

Probability – PART B

Name: _____

1   Are the following statements true or false?
    (a)   It is highly likely that thunderstorms
          occur with heavy, dark clouds.

    (b)   The chance of winning a game of tennis
          with a broken racquet is highly likely.

2   Choose a phrase from the list to match each of
    the following situations.
        even chance, highly likely, highly
        unlikely, impossible, no chance
    (a)   Catching a cold while outside in the rain
    (b)   Not watching any television after school

3   Give 2 examples of events which are:
    (a)   even chance

    (b)   certain.

4   A fair coin is tossed 50 times and a Head
    comes up 15 times.
    (a)   Find the relative frequency of obtaining a
          Head, as a fraction.

    (b)   Calculate the relative frequency of
          obtaining a Tail, as a decimal.

5   A 'loaded' die is thrown 30 times. What is the
    expected frequency of obtaining the number 2

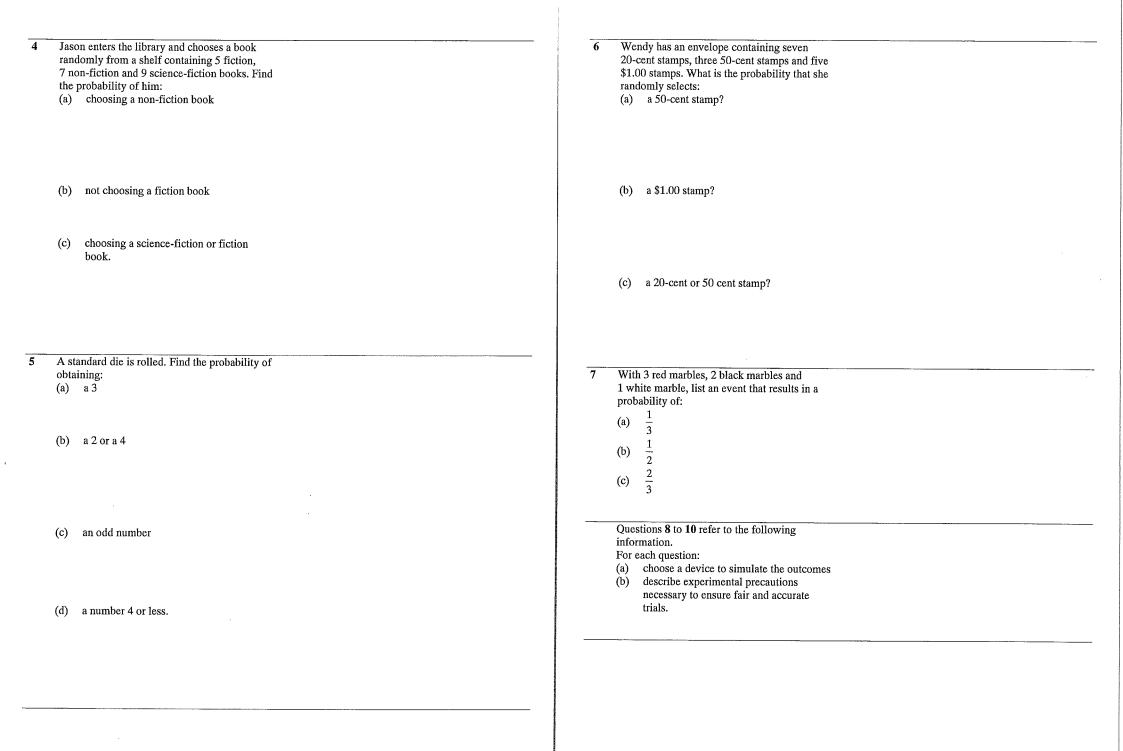   if the relative frequency of obtaining a 2 is $\dfrac{2}{3}$?

6   A spinner is numbered 1 to 12.
    List the outcomes for each event.
    A = obtaining an even number
    B = obtaining an odd number
    C = obtaining a multiple of 3

7   A spinner with 4 equal sectors was operated
    40 times, with results as shown below.

Score	1	2	3	4
Frequency	15	12	8	5

    What fraction of spins resulted in:
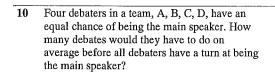   (a)   4?

    (b)   2?

8   When tossing a coin, a Head came up 46 times.
    How many times would you have to toss the
    coin so that the relative frequency of a Head is
    0.3?

9   What is the frequency of a spinner, numbered
    1 to 3, landing on the number 2 if the total
    number of spins is 100? The relative frequency

    of landing on 2 is $\dfrac{1}{5}$.

10   From a wishing well 1500 coins are collected for charity. To estimate the value of all money collected, 50 coins are selected at random. The following results are found:

$2 – 8
$1 – 13
50c – 9
20c – 11
10c – 5
5c – 4

(a)   Use the results to estimate the number of each coin that is collected.

(b)   Estimate the total value of the coins in the wishing well.

Probability – PART C

Name: _____

1   List the sample space of :
(a)   a 5-sided die
(b)   a deck of playing cards.

2   Match the list of events below with the appropriate sample space.
Spinner 1–4
Coin
Die
(a)   {1, 2, 3, 4}
(b)   {1, 2, 3, 4, 5, 6}

3   A Bingo card is numbered from 11 to 20. What is the probability that the winning number will be:
(a)   11?

(b)   an even number?

(c)   a prime number?

4 Jason enters the library and chooses a book randomly from a shelf containing 5 fiction, 7 non-fiction and 9 science-fiction books. Find the probability of him:

(a) choosing a non-fiction book

(b) not choosing a fiction book

(c) choosing a science-fiction or fiction book.

5 A standard die is rolled. Find the probability of obtaining:

(a) a 3

(b) a 2 or a 4

(c) an odd number

(d) a number 4 or less.

6 Wendy has an envelope containing seven 20-cent stamps, three 50-cent stamps and five $1.00 stamps. What is the probability that she randomly selects:

(a) a 50-cent stamp?

(b) a $1.00 stamp?

(c) a 20-cent or 50 cent stamp?

7 With 3 red marbles, 2 black marbles and 1 white marble, list an event that results in a probability of:

(a) $\dfrac{1}{3}$

(b) $\dfrac{1}{2}$

(c) $\dfrac{2}{3}$

Questions **8** to **10** refer to the following information.
For each question:
(a) choose a device to simulate the outcomes
(b) describe experimental precautions necessary to ensure fair and accurate trials.

8 The school canteen has ordered 3 new cans of flavoured drinks which are equally popular. How many drinks must be sold on average before the canteen can be sure that all types will be sold?

9 In a particular country town there are only two road signs: STOP and GO. Assuming that each is equally likely, on average how many streets must you go through before each road sign is encountered?

10 Four debaters in a team, A, B, C, D, have an equal chance of being the main speaker. How many debates would they have to do on average before all debaters have a turn at being the main speaker?

Probability - PART D

Name: _____

(1) Describe each of the following events as being certain, likely, even chance, unlikely or impossible.
   (a) Rolling a standard die and getting a 7.
   (b) Selecting a numbered card from a standard deck.
   (c) Winning the lottery.
   (d) Christmas falling on 25 December this year.
   (e) Selecting a red card from a standard deck.

(2) The table below shows the number of times that various types of vehicles passed by Rebecca's house during an hour.

Cars	63
Motorbikes	18
4-wheel drives	14
Trucks	5

What is the relative frequency (as a decimal) of:
   (a) cars?

   (b) motorbikes?

   (c) 4-wheel drives?

   (d) trucks?

(3) Jessie needs to estimate the number of people who play tennis in a certain town. The population of the town is 25 630.

On a given day she randomly selects 200 people off the street and she finds that 14 of them play tennis.

Use this information to estimate the number of tennis players in the town.

(4) List the sample spaces for each of the following probability experiments.
   (a) In a word game a player must select one of the five vowels.

   (b) Opening the page of a book and noting if the page number is odd or even.

   (c) Selecting a marble from a bag containing 3 red, 4 black and 2 clear marbles.

(5) Three boys, Andrew, Cory and Evan, and two girls, Bianca and Deidre, are standing for election as class captain. One candidate is chosen at random to make the first speech to the class.
   (a) List the sample space.
   (b) Find the probability that:
     i) Bianca is chosen

     ii) a boy is chosen

     iii) a boy is not chosen.

(6) Find the complement of each of the following events.
   (a) A coin landing heads.
   (b) Selecting a number greater than 15.
   (c) Selecting the letter E from the alphabet.

0 (7) A die is rolled. What is the probability that the number rolled is not a 4?

(8) A card is selected from a standard deck. What is the probability that the card chosen is not a diamond?

(9) The probability that Mario wins a computer game is $\frac{2}{5}$. What is the probability that Mario does not win?

0 For each of the following explain whether the events listed are complementary or not.

(10) Winning or losing a game of soccer.

(11) Selecting a letter of the alphabet and getting a vowel or a consonant.

(12) Selecting a number greater than 20 or selecting a number less than 20.

0 In a money box there are 15 two-dollar coins, 8 one-dollar coins and 37 twenty-cent coins. If a coin is selected at random from the money box, find the probability that the coin chosen is:

(13) a two-dollar coin

(14) a one-dollar coin

(15) not a one- or two-dollar coin.

0 A survey was conducted to determine how
many students do woodwork at school.

	Woodwork	Not woodwork	TOTAL
Boys	45	5	50
Girls	12	38	50
TOTAL	57	43	100

A student is chosen at random from this group.
What is the probability that the student:

(i)   is a boy?

(ii)   does woodwork?

(iii)   is a girl who chose woodwork?

(iv)   is not a boy who chose woodwork?