Haileybury

Name	
Current School	

Mathematics
Entrance exam for: 14+ (Sample)
Time allowed: 45 minutes
Total marks: 50

Please read this information before the examination starts
- Answer **all** questions
- Please write your solutions on the question paper and, where relevant, in the designated space.
- You may **not** use a calculator.

Section A (20 marks)
Section A is designed to test core skills and understanding. You should answer each question in the answer box on the right-hand side.

Section B (30 marks)
Section B contains a greater element of problem solving. It contains a mixture of multiple choice and written answer questions. You should complete the written answer questions in the space provided and you will be marked on the presentation of your written work in addition to your final solution; answers without supporting work/calculations may not score full marks.

For office use only

Marks awarded:	

	Comments:	

Section A

Each of the following questions are worth 1 mark

Write your answers down the right-hand side

		Answer
1	Calculate $573 + 48$	
2	Calculate $20 - 2 \times 5 - 7$	
3	Calculate $\frac{2}{3} + \frac{1}{6} - \frac{1}{12}$	
4	Calculate $5 \times \frac{7}{3}$	
5	Calculate 435×7	

6	Find the value of 2^5	
7	Find the value of 4^{-2} Hint: $x^{-a} = \frac{1}{x^a}$	
8	Solve $2x + 7 = 11$	
9	Solve $3(x - 4) = 12$	
10	At the bakers, iced buns cost 80p and cinnamon rolls cost £1.10. How much do 2 iced buns and 1 cinnamon roll cost?	

Each of the following questions are worth 2 marks

Write your answers down the right-hand side

		Answer
11	Factorise $x^2 + 2x - 15$	
12	Solve $5(3x - 4) = 10x + 5$	
13	Expand and simplify $5(4y + 5) + 3(5y - 1)$	

14	Make k the subject of the equation $5p + 3 = \frac{k-1}{2}$	
15	In a certain year, the value of a painting increased by 20%. If at the start of the year it was worth £2400, how much is it worth now?	

Section B

Each of these multiple choice questions is worth 2 marks.

If you give an incorrect answer you will be **deducted** 1 mark.

Write your answer by putting the relevant letter on the right hand side.

		Answer
1	Which statement is true? A: $24 \times 70 = 74 \times 20$ B: $24 \times 70 = 48 \times 35$ C: $24 \times 70 = 12 \times 35$ D: $24 \times 70 = 48 \times 140$	
2	What is the value of the missing digit? $$4714 \times 28 = 1319\,?\,2$$ A: 4 B: 6 C: 2 D: 9	
3	A line parallel to $y = 3x - 5$ passes through the point $(2, 9)$. What is its equation? A: $y = 9x + 3$ B: $y = 3x + 3$ C: $y = 3x + 9$ D: $y = 3x + 7$	

4	Write $$x^2 + 4x + 3$$ In the form $$(x + p)^2 + q$$ A: $(x + 2)^2 - 4$ B: $(x + 2)^2 - 3$ C: $(x + 2)^2 - 1$ D: $(x + 2)^2 - 7$	
5	The mean, median and mode of the numbers below are the same, what is the value of a? $$6, 2, a, 7, 4, 9, 6$$ A: 5 B: 6 C: 7 D: 8	

For the following questions you should show all of your working clearly.

Correct answers without working may not receive full marks.

6   Solve the following pairs of simultaneous equations   **[3]**

$$2x + 3y = 10$$
$$5x - y = -9$$

....

7   Solve $3n + 2 \leq 4n - 5$ **[2]**

....

8   A car travels at an average speed of 45 mph for 20 minutes.
     The next part of the car's journey takes 30 minutes at an average speed of 70 mph.
     Hint: Speed $= \frac{Distance}{Time}$

     (a) What is the total distance travelled?   **[3]**

     ....

     (b) What is the average speed of the entire journey in mph?   **[2]**

     ....
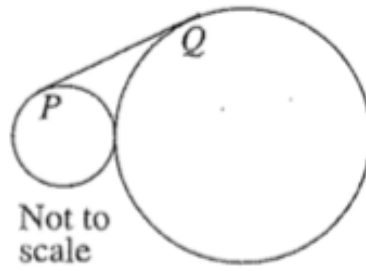
10   A cup of tea costs £x and coffee is £$2x - \frac{1}{4}$, where x is in pounds.   **[5]**
      If 3 teas and 2 coffees cost £5.80, find x.

....

11   Two circles with radii 1 cm and 4 cm touch. The point P is on the smaller circle, Q is on the larger circle and PQ is a tangent to both circles.   **[5]**

Not to
scale

Find the length PQ.

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End of Exam