

Eton College King's Scholarship Examination 2023

GENERAL I

(One hour)

Remember to write your candidate number on every sheet of answer paper used.

You must answer both questions.

Each question is worth the same number of marks.

*You need not answer the questions in the order set, **but you must start each one on a separate piece of paper.***

*If you have not finished a question after 30 minutes, **you are strongly advised to leave it and go on to the other.** Return to any unfinished question if you have time left at the end of the paper.*

ADDITIONAL MATERIALS: NONE

Do not turn over until told to do so.

GENERAL I

Question 1: START A NEW SHEET OF PAPER NOW.

If you have not finished this question after 30 minutes, you are strongly advised to leave it and go on to the other.

In the two problems below, your powers of logic are being tested. **You must give clear explanation and reasoning in your answers to gain marks.**

Dwarf speak

Ten dwarfs make statements:

- Dwarf 1: At least one of us is lying.
Dwarf 2: At least two of us are lying.
Dwarf 3: At least three of us are lying.
Dwarf 4: At least four of us are lying.
Dwarf 5: At least five of us are lying.
Dwarf 6: At least six of us are lying.
Dwarf 7: At least seven of us are lying.
Dwarf 8: At least eight of us are lying.
Dwarf 9: At least nine of us are lying.
Dwarf 10: At least ten of us are lying.

- (a) Consider dwarf 10. Explain clearly why he is lying. [2]
(b) Now consider dwarf 9. Is he lying or tell the truth? [2]
(c) Of the other dwarfs, which are lying and which are telling the truth? [8]

Gaming

Two players, A and B, take it in turns to name dates. Player A starts by naming January 1 (the first day of January, the year is irrelevant.) Any date named subsequently must be later in the year and have either the same month or the same day value as the previous date.

For example, player B, in his first turn, can name any of February 1, March 1, April 1December 1, or January 2, January 3,.....January 31.

The player to call out December 31 wins the game.

Which player can always win the game and what is the correct strategy?

You may assume that February has 28 days (though the correct strategy would not change even if February had 29 days). [13]

[Total mark for Question 1: 25]

GENERAL I

Question 2: START A NEW SHEET OF PAPER NOW.

If you have not finished this question after 30 minutes, you are strongly advised to leave it and go on to the other.

Rifling through the archives, the College Librarian recently discovered a page of sentences translated by a boy into an unknown language.

Correct his work.

Sentences to Translate

- i. ligna belom ta
- ii. lignak yan tralom zu
- iii. grole pozzo belom span
- iv. lignak pozzo belom spiran
- v. grolek yank pozzo tralom koan
- vi. yank ligna tralom zu
- vii. michalak belom tira
- viii. lignak michala pozzo tralom koan
- ix. michalak grolek tralom zitu
- x. yank lignak pozzo tralom kitoan
- xi. michala pozzo belom span
- xii. lignak grolek pozzo tralom kitoan

Hints:

- There is only one mistake.
- The mistake can be corrected by replacing a single word.
- Your answer should indicate (i) the incorrect word (ii) how it should read and (iii) how you tackled the question.
- Marks will be awarded for evidence of a sensible approach even if you fail to reach the correct answer, so be sure to include a brief but clear explanation of your working, which may be in note form.
- No knowledge of the language is needed to complete the question.

[Total mark for Question 2: 25]

END OF PAPER