APTITUDE EXAM

FOR SCHOLARSHIPS TO BE AWARDED IN SEPTEMBER 2017

WEDNESDAY 1st FEBRUARY 2017 - AFTERNOON
DURATION - 2 HOURS, 10 MINUTES
(to include 10 minutes reading time)

INSTRUCTIONS TO CANDIDATES

You are required to answer **ONE** question from Section A and **ONE** question from Section B.

In **Section A** you are asked to provide **THREE** solutions to a problem. You will be marked on the following:

		Mark
a)	**Quality** of your **THREE** solutions – how well you solve the problem along with the flair and imagination of your ideas.	30
b)	**Reasoning** of your concepts – how well they may work, with operating principals explained and justified.	10
c)	**Technical knowledge** – how much technical / engineering knowledge you demonstrate in your ideas and annotations.	10
	SECTION A TOTAL	**50**

In **Section B** you are asked to solve a more focused problem, providing only **ONE** solution.
You will be marked on the following:

		Mark
a)	The **functionality** of your given proposal	30
b)	The consideration given to choice of **materials** and **components**	10
c)	The consideration given to the method of **construction**	10
	SECTION B TOTAL	**50**

GRAND TOTAL	**100**

Please fill in the information box at the bottom of each answer sheet with:

- Your candidate name and school name clearly printed on each sheet.
- The number of the question you have chosen to answer.
- The page number.

Please start each question on a fresh sheet of paper

Applicants must not discuss the exam on social media or in any other way

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

© 2017 Arkwright Scholarships Trust

Section A

OPEN-ENDED QUESTIONS
In this section you will be assessed on your ability to solve the problem set in a CREATIVE AND INNOVATIVE way.

Answer ONE question only from the following TWO questions.
You must provide **THREE** solutions to the question you select.

Question 1

Britain enjoys a high rainfall. Suggest **three** ways in which households could harness this resource to help power devices around the house.

---o0o---

Question 2

At the end of their life many products end up in landfill. Design **three** useful products that could be constructed predominantly from thrown away waste.

---o0o---

End of Section A

© 2017 Arkwright Scholarships Trust

Section B

FOCUSED QUESTIONS

In this section you will be assessed on your ability to present ONE DETAILED TECHNICAL SOLUTION to the given problem focusing on functionality, materials and construction.

Answer ONE question only from the following TWO questions.

Question 3

Materials are often supplied in rolls and need to be cut for use. Design a device that measures, and cuts from a roll, lengths of aluminium foil.

The device must be automated, safe and be adjustable in order to dispense different lengths of foil. The roll is 300mm wide.

---o0o---

Question 4

Children from a remote village have to climb up an unsecured ladder on a vertical cliff to get to school.

Design a safe and cheap means of carrying the students up and down the cliff.
Describe in detail any safety systems employed and how the lift is powered.

END

© 2017 Arkwright Scholarships Trust

Applicants must not discuss the exam on social media or in any other way

Arkwright Scholarships Trust
Holly House, 74 Upper Holly Walk
Leamington Spa, Warwickshire, CV32 4JL

01926 333210
arkwright.org.uk

Registered Charity No 1091988
Registered in England and Wales No. 4401993

© 2017 Arkwright Scholarships Trust