

APTITUDE PAPER

FOR SCHOLARSHIPS TO BE AWARDED
IN SEPTEMBER 2007

WEDNESDAY 6th FEBRUARY 2008
DURATION 2 HOURS

INSTRUCTIONS TO CANDIDATES

You are required to answer **ONE** question only.

In your answers you should;

	Mark	Suggested Time In Minutes
a) Develop a full specification that offers supporting reasons behind each important point	15	20 mins
b) Produce at least three initial concepts, which demonstrate flair and imagination that relate to the specification. Candidates should identify the relative merits of the ideas introduced.	45	60 mins
c) Develop your preferred solution. You should address the following: <ul style="list-style-type: none"> ◆ Materials ◆ Construction ◆ Function ◆ Features ◆ Sizes/Dimensions 	30	40 mins
d) Demonstrate an organised, logical and well presented response.	10	
TOTAL MARKS	100	

ALL YOUR A3 ANSWER SHEETS MUST HAVE IN THE TOP RIGHT HAND CORNER

- ◆ Your name and school clearly printed
- ◆ The number of the question you have chosen to answer.
- ◆ The page number

**DO NOT TURN OVER UNTIL YOU ARE
INSTRUCTED TO DO SO**

ALL ANSWERS MUST CLEARLY SHOW ALL CONSTRUCTIONAL DETAILS, MECHANISMS AND/OR CIRCUITS.

QUESTION 1

A potential concern for parents when out with their children is that they become separated.

You are asked to design a remote alarm. This would be worn by a child and there would be a separate unit that the parent would keep. The basic principle would be for the alarm to sound if the child moved outside an adjustable range. The child's unit should fit in such a way that unauthorised removal would itself trigger the alarm. A final consideration would be for the unit to have a panic alarm.

You are asked to design both units, one suited to a child and a second suited to an adult. The specification must highlight principal functional and human factor requirements.

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QUESTION 2

London has successfully bid to hold the 2012 Olympic Games.

The Games will attract many visitors to the capital and to assist with the promotion of all events an exciting method of gaining the visitors attention is required.

For this purpose, you have been asked to design a mechanical sculpture which should have movement of some form (**not** electronic monitor displays). The sculpture should be designed on a sports theme to advertise **one** discipline in the Games. (Football, Hockey, Athletics, Field Events, Archery, Horse related events, Tennis etc.)

The sculpture should encourage people to take an interest in a specific event in the games.

Your sculpture must be environmentally friendly using where possible, renewable sources of materials and environment friendly power sources (solar, wind power etc.)

Give full details of construction methods and power source.

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QUESTION 3

Your local supplier of footwear for hill-walking requires an imaginative display / footwear try out area.

The concept should include the opportunity for hill-walkers to try out boots in simulated conditions using a mechanical/powered system that can simulate differing terrains (ground condition and incline).

The area available is three metres by four metres and is set against two strong adjacent outside walls. The floor is strong enough to support a minor rock formation if required.

Customer safety is an important factor.

Mains electricity and pressurised air is available for use.

END

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