

APTITUDE PAPER

FOR SCHOLARSHIPS TO BE AWARDED
IN SEPTEMBER 2006

WEDNESDAY 8th FEBRUARY 2006
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 golf driving range has commissioned you to design an automatic golf ball dispenser that when filled with golf balls will deliver a ball onto a tee to allow the golfer to hit a practice drive.

When the golfer has hit the ball the system should automatically refill the tee with another golf ball.

The system should be able to hold fifty golf balls, automatically dispense them and indicate the number left in the storage hopper.

The tees are situated on an elevated platform allowing space in the floor for any mechanical devices to be fitted.

A compressed air supply, low voltage power supply, portable computer, including interface, and a variety of electro and mechanical devices are available.

For all systems the input, process and output information should be included.

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QUESTION 2

Young people enjoy socialising in informal settings. The Night Club scene continues to be popular and outdoor events too are rising in popularity. In recent times a serious problem has come to light whereby drinks are being spiked with dangerous substances. Continued/..

QUESTION 2 – continued

A major drinks company has asked you to design a safe drinks container that should be perceived as fashionable+to be used by

young adults. In this sense it should be stylish, but shape and form is left to the discretion of the designer. A standard bottle/ glass / tumbler may be adapted. Alternatively the container may be a completely new product.

In looking to solve this problem you are asked to consider a number of different ways of preventing a drink from being spiked. The final product is intended for single use and must lend itself to recycling. Materials and the method of manufacturing should be carefully assessed for suitability.

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QUESTION 3

We are all increasingly aware of the need to conserve the world's energy resources yet many find it difficult to relate the use of energy in their own home to the global situation.

You are asked to design a device / system that monitors the use of ONE type of energy used in the home and displays it in a meaningful way. The display should be easy to understand by all age groups and should encourage energy conservation with some form of suitable indicator.

For the purpose of this exciting and important design challenge your device /system should be designed to be fitted into new build+ properties. Alternatively a retro-fit facility or an independent unit may be considered.

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