

ADVANCED SUBSIDIARY GCE

APPLIED SCIENCE

Cells and Molecules

G623/INSERT

PLAN FOR AN INVESTIGATION

INSERT

For issue on or after: **13 MARCH 2011**



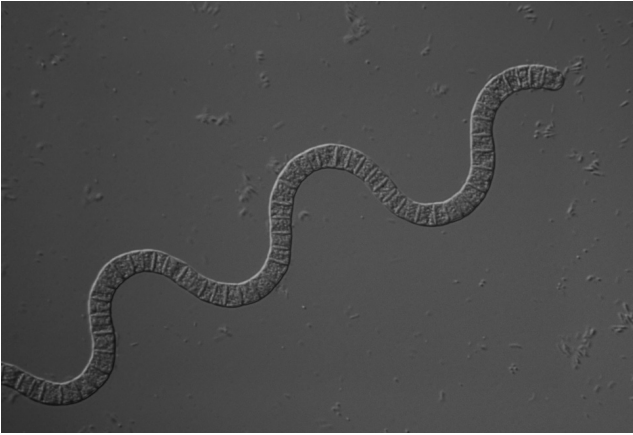
INFORMATION FOR CANDIDATES

- The abstracts on page 2 of this insert are to give you some background that you might find helpful in planning for the task that follows. Not all the information included will be directly relevant and you are expected to select the information that is relevant to the task.
- This document consists of 4 pages. Any blank pages are indicated.

INSTRUCTION TO EXAMS OFFICER / INVIGILATOR

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***Spirulina*: The little algae that could.....**



Spirulina is a genus of filamentous cyanobacteria (formerly called blue-green algae). *Spirulina* is the common name given to two different species of cyanobacteria: *Arthrospira platensis* and *Arthrospira maxima*.

Spirulina are free-floating photosynthetic spiral shaped cyanobacteria. The organism occurs naturally in tropical and subtropical lakes with high pH and high concentrations of sodium carbonate and sodium hydrogencarbonate. *A. platensis* occurs in Africa, Asia and South America, whereas *A. maxima* is confined to Central America.

Spirulina is cultivated around the world on a commercial scale to be used as a human dietary supplement as well as a whole food. It became famous after it was successfully used by NASA as a dietary supplement for astronauts on space missions. It is also exploited for animal feed and pharmaceuticals because of its ability to produce large quantities of vitamins and minerals.

***Spirulina* cultivation: low investment, high income**

Most cultivated *Spirulina* is produced in open-channel raceway ponds, with paddle wheels used to agitate the water. The largest commercial producers of *Spirulina* are located in the United States, Thailand, India, China, Pakistan and Myanmar.

Raceways are rectangular troughs of concrete or plastic of varying sizes, angled slightly to allow a shallow stream of water to flow directly from one end to the other.



Spirulina grows well in regions having temperatures between 25–35 °C. Starter cultures of *Spirulina* are released into the tanks along with mineral supplements that include sodium hydrogencarbonate. After 10 days the *Spirulina* is ready to harvest.

The *Spirulina* is then filtered, dried, ground and packaged into capsules, tablets, flakes and powders.



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