



**ADVANCED GCE  
BUSINESS STUDIES**  
Business Production

**F296**

Candidates answer on the Question Paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**  
None

**SPECIMEN 2010**

**Duration: 2 hours**



Candidate Forename		Candidate Surname	
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Centre Number							Candidate Number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided; however additional paper may be used if necessary.
- It is recommended that you spend 10–15 minutes reading and annotating the material in the Case Study. You will be expected to refer to this material in your answers.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- The quality of your written communication will be taken into account when marking your answers to questions labelled with an asterisk (\*). Marks will be awarded for spelling, punctuation and grammar, use of appropriate form and style of writing, and for organising work clearly and coherently.
- This document consists of **12** pages. Any blank pages are indicated.



## Northbury Cement

In 1962 Northbury Cement (NC) commenced production, supplying customers over the counties of South West England. Working at full capacity, the plant can produce 700,000 tonnes of cement per annum. Last year the factory produced 650,000 tonnes. Raw materials are found nearby and there is a further 25 years supply available providing that the firm can gain planning permission for expanding their chalk quarry. Cement is one of the most versatile building materials. The local economy has grown rapidly over the last decade and recently the government has approved plans for further future expansion in both housing and infrastructure.

NC has two kilns for making cement and uses the wet process method of production. This is more expensive than the dry production process used at other plants in the UK. The production of cement at Northbury is subject to the following process:

- 1 Chalk is quarried and then crushed and mixed with water to produce a thick solution called "slurry". This is then piped to the cement works via a 3 km underground pipeline.
- 2 Clay is also quarried nearby, mainly in the summer, so some can be stockpiled for the winter.
- 3 The clay is then added, along with other materials to the chalk slurry.
- 4 The blended slurry is then fed into the kilns. The kilns rotate and are heated using a variety of fuels such as used tyres, coal and coke. The heat of the materials increases to 1450°C as the raw materials pass through the kiln.
- 5 Burning at high temperatures turns the material into a hard gritty material called "clinker".
- 6 The "clinker" is then ground into a fine powder in the cement mill.
- 7 The powder is then either packed in bags or stored in silos (storage containers) for distribution by road or by rail using specialist bulk tankers.

Currently NC employs 120 people, with 40 working in production and 35 on the engineering side. Most of the remainder are in management or administration. The factory operates a continuous 12 hour shift system. Many staff are highly specialised having gained qualifications at local FE colleges. Apart from those looking after the computer control systems, process engineers check computer data to maximise the efficiency of the plant.

NC always aims to achieve the highest production standards. Laboratory technicians and chemists check the quality of raw materials and finished products. Quality is assessed at all stages of the production process. Tests are carried out on an hourly basis. Where major civil engineering projects are concerned, e.g. shopping malls or hospitals, blocks are made and tested for strength after 7, 14 and 28 days.

Apart from researching into new products to meet its customers' requirements, scientists in NC's laboratories are continuously testing alternative raw materials that could be used in the production process, (such as fuel ash from power stations to replace clay).

NC is always looking at methods to reduce costs. It is researching the use of different waste products to replace the used tyres, coal and coke. Fuel is a major cost at the plant with current spending exceeding £2 million this year and budgeted to be 50% more for the next three years. Recycled household rubbish could be the fuel of the future though plans for a £16 million waste processing plant producing Solid Recovered Fuel (SRF) were unveiled this week. Northshire County Council has awarded a 25-year contract to waste processing company, Digest plc. Digest plc have proposed that it, and NC, create a joint venture to build and run a waste processing plant to be built at the cement works site. Each firm would invest 50% of the start-up cost. Not only would this reduce NC's fuel costs to zero but it would also save the local council having to pay to send 60,000 tonnes of waste to landfill sites.



Stock control is another area where significant savings can be made. NC uses a computer-based system to monitor all stock held for maintenance. In 2006 the factory held about **6000 lines** of maintenance stock ranging from motors and gearboxes to nuts, bolts and protective gloves. **(Maintenance stock has a value of £1.5 million so the average value of a line of stock is £250)**. Management aims to reduce the number of lines of maintenance stock held to 2500 by the end of 2007.

Health and Safety and the environment are key issues at the factory. There are monthly safety briefings and training sessions. Health and Safety Inspectors must investigate all serious incidents. New laws require the factory to lower gas and dust emissions. In the 5 years from 2000, £21 million was spent on the works to improve efficiency, safety and environmental performance. However, pollution incidents still occasionally occur (see Fig. 1). Strict laws also apply concerning the disposal of waste materials and noise from factory machinery.

#### Northbury pledge over emissions?

The Environment Agency handed out an enforcement notice on Northbury Cement last week after it exceeded its emissions limits from burning waste tyres. However, bosses said they had already acted and emissions now are much lower than a year ago. Last year the company spent £250 000 on continuous monitoring of emissions. There is no risk to people's health said Northbury Work's Manager, Dave Flory.

Jack Levy of pressure group The Air that we Breathe, said "This is something we predicted would happen."

Fig. 1



Answer **all** questions.

- 1 Using the information in lines 44–52, calculate the percentage saving in the value of maintenance stock NC might achieve by the end of 2005, if it can reach its stock level target. (Ignore any change in stock prices that may occur)

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- 2 Analyse why it might be difficult for NC to achieve further reductions in its levels of stock held.

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4 Analyse whether Northbury is a suitable location for continuing cement production over the next 10 years.

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