



**Cambridge International Examinations**  
Cambridge International Advanced Level

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**APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY**

**9713/31**

Paper 3

**October/November 2015**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No additional materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

Do not use staples, paper clips, glue or correction fluid.

You may use an HB pencil for any diagrams, graphs or rough working.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

The number of marks is given in brackets [ ] at the end of each question or part question.

The businesses described in this paper are entirely fictitious.

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This document consists of **16** printed pages.

**Scenario 1****Questions 1, 2, 3 and 4.**

Global Scientific is a company that manufactures industrial chemicals in a large factory. The company employs scientists to monitor the environmental conditions to ensure that the factory and the surrounding areas are kept safe from pollution from the industrial chemicals.

The scientists collect data manually by going into the factory and out into the surrounding areas where they use laptops to record the data that they collect.

The scientists also use sensors connected to their office computers to collect data.

The data from the manual collection and from the sensors is sent to head office to be analysed and used in weekly reports.

- 1 Describe how data logging could be used to monitor the environmental conditions around the factory.

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- 2 Describe how the functions available in a spreadsheet could be used to analyse the collected data.

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- 4 Describe how FTP could be used to transfer the data files between the computers at the factory and the head office.

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**Scenario 2****Questions 5, 6 and 7.**

NoRisk Bank plc holds the financial details of a large number of personal and commercial account holders. The bank allows account holders to manage their accounts online.

Gupta is a network administrator responsible for the safety and security of the data held by NoRisk Bank plc.

Gupta uses a number of different methods to try and keep the data associated with the accounts safe and secure. When logging in, the bank's computer system requires account users to undergo authentication.

Gupta also uses a range of anti-malware software to try to prevent the corruption and theft of the data.

5 (a) State what is meant by ‘authentication’.

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(b) Passwords are a method of authentication. Describe **two** other methods of authentication that could be used when account holders log into an account.

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6 (a) Describe how a firewall can help to keep the account data secure.

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(b) Describe the drawbacks of using each of the following methods of keeping data secure.

(i) Security guards .....  
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(ii) Encryption .....  
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7 Describe how Gupta would use each of the following anti-malware applications to keep data safe and secure.

Anti-virus software .....

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Anti-spyware software .....

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Anti-popup software .....

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**Scenario 3****Questions 8, 9, 10 and 11.**

Global Systems is an international company with one head office and a number of other offices around the world. It has a business network that uses wired and wireless methods of data transmission. The wireless network requires a security key for access.

The network is used for transferring data around the network from computer to computer, to and from servers and for sharing peripherals such as scanners and printers.

The business network also allows users to communicate with each other and has internet access to allow communications between users in different offices and with others around the world.

The business network consists of local area networks (LANs) in the head office which are connected into a wide area network (WAN) with the LANs in other offices using public telecommunications systems.

8 Describe how spread spectrum transmission is used in wireless networking.

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9 Explain **two** reasons why infrared is not often used for wireless networking.

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10 Explain why wired equivalent privacy (WEP) should no longer be used to secure wireless networks.

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**Scenario 4****Questions 12 and 13.**

Speedy Dropoff Co owns a number of trucks that it uses to deliver parcels in a large city. It keeps the trucks in a parking garage just outside the city.

The company also has a maintenance garage where servicing of the trucks, repairs and diagnosing of engine faults is carried out. Engine fault diagnosis is carried out using an expert system.

Rowena is the delivery manager of the company and uses route scheduling software to work out the shortest route that each truck should take to make its deliveries. She also wants the trucks to take the most economical routes.

12 (a) Explain, with detailed descriptions of the components, what is meant by an “expert system”.

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(b) Describe, apart from car fault diagnosis and route scheduling, **two** other uses of expert systems.

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13 (a) State **four** inputs to the route scheduling software so that it can work out the shortest route for a delivery truck.

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(b) Describe **one** other input that must be entered so that the route scheduling software can work out the most economical route.

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