



22137013



International Baccalaureate®  
Baccalauréat International  
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**COMPUTER SCIENCE  
STANDARD LEVEL  
PAPER 1**

Tuesday 14 May 2013 (afternoon)

1 hour 30 minutes

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**INSTRUCTIONS TO CANDIDATES**

- Do not open this examination paper until instructed to do so.
- Section A: answer all the questions.
- Section B: answer all the questions.
- The maximum mark for this examination paper is *[70 marks]*.

## SECTION A

Answer **all** the questions.

1. State **two** forms of direct data entry. *[2 marks]*
  
2. Outline **one** advantage and **one** disadvantage to protest groups of communicating by social networks. *[4 marks]*
  
3. Identify **two** uses of CASE development tools in the development of a computer-controlled manufacturing process. *[2 marks]*
  
4. With reference to the CPU,
  - (a) Outline the function of the control unit *[2 marks]*
  - (b) Describe how the size of the registers is related to the size of primary memory. *[2 marks]*
  
5. Describe a disadvantage of the use of virtual memory. *[2 marks]*
  
6. Outline the function of virus-checker software. *[2 marks]*
  
7. Outline **one** difference between ASCII and UNICODE representation. *[2 marks]*
  
8. (a) Express the decimal number 189 as hexadecimal. You must show your working. *[2 marks]*
  
 (b) Convert –87 to an 8 bit two’s complement representation. *[2 marks]*
  
9. Consider the following fragment of code.

```
int x = 15;
int y = 6;
double z = x;
double v = z/y;
```

State the value for  $v$ , explaining your answer. *[3 marks]*

- 10.** Discuss, with an example, when the use of a mirrored system is essential. *[3 marks]*
- 11.** Describe the error-check sum in data transmission. *[2 marks]*

## SECTION B

Answer **all** the questions.

- 12.** A LAN in a health centre allows two receptionists and four doctors to share three PCs and a printer which are connected to a server. The LAN has a star topology, and uses cables.

(a) (i) Define the term *server*. [1 mark]

(ii) Define the term *client*. [1 mark]

(b) Outline the role of a hub in a star topology. [2 marks]

The doctors can access only the medical records of the patients; the receptionists cannot access the medical records of the patients and deal only with registering new patients and booking appointments.

(c) (i) Describe how the access of the doctors and the receptionists can be restricted to the appropriate parts of the file system. [2 marks]

It is proposed to allow patients partial access to the health centre's system over the internet.

(ii) Explain the type and level of access that should be granted to the patients and how this would be achieved. [4 marks]

13. Consider the following method.

```
public boolean property(String s)
{
    int len=s.length();
    int m;
    if (len%2 != 0)
    {m=len/2 + 1 ;}
    else {m=len/2;}
    int i=0;
    int j=m;
    while (i<m && j<len)
    {
        if (s.charAt(i) != s.charAt(j))
        {return false;}
        i=i+1;
        j=j+1;
    }
    return true;
}
```

(a) State the value of  $m$  when the string  $s$  is “abcdefg”. [1 mark]

(b) By copying and completing the following table, trace the method for the call `property (“xyzdxyx”)`. [4 marks]

| i | j   | $i < m \ \&\& \ j < \text{len}$ | <code>s.charAt(i) != s.charAt(j)</code> | return |
|---|-----|---------------------------------|---|--------|
| 0 | ... | ...                             |   | ...    |
|   |     |                                 |   |        |

(c) Identify a string for which the program would return true. [1 mark]

(d) Identify the termination conditions for the loop. [2 marks]

(e) Explain how the use of the return statement affects the efficiency of the method `property()`. [2 marks]

- 14.** An IT solutions company will provide a system for a major customer. The system analysis has been carried out and a feasibility report has been presented to the customer.

(a) State **two** pieces of information that the feasibility report may contain. *[2 marks]*

The company is considering using either commercial software or customized software.

(b) Discuss the factors that will affect their decision. *[4 marks]*

(c) Explain why more than one cycle of analysis and design might be desirable. *[4 marks]*

- 15.** A charity organization has designed its own website. This website can be accessed through different browsers.

(a) Identify a language for constructing web pages. *[1 mark]*

(b) Outline the function of a browser, as an application. *[2 marks]*

(c) Suggest, with reasons, if the browser behaves as an interpreter or a compiler of the language identified in part (a). *[3 marks]*

It is possible to make donations through the website. Donations are not anonymous and can be further referred to by the donors, for tax return purposes.

(d) Suggest how the organization can ensure that data is secure from unauthorized access. *[4 marks]*

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