



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**COMPUTER STUDIES**

**0420/31**

Paper 3 Alternative to Coursework

**October/November 2014**

**1 hour 30 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.

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

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

**DO NOT WRITE IN ANY BARCODES.**

There is one compulsory question on this paper.

Each part must be answered in the space provided.

No marks will be awarded for using brand names of software packages or hardware.

You are advised to spend at least 20 minutes reading the information at the start of question 1 since this information is needed to answer all the sections in this question.

All answers must refer to this information system.

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

The maximum number of marks is 60.

**For Examiner's Use**

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This document consists of **11** printed pages and **1** blank page.

In this question you are asked to read about:

- an existing manual, paper-based system for recording the results of races on a school sports day
- the computer-based, semi-automatic recording system proposed to replace it

You are given a description of both the existing and the proposed new computer-based system.

### **Description of the existing system**

Students in a school belong to one of four houses. A house shield is presented at the end of the sports day to the house with the most points.

House points are awarded for each race:

- First Place – 10 points
- Second Place – 5 points
- Third Place – 2 points

Before the start of each race the names and houses of the students entering are recorded on an entry sheet. After each race, the students in places 1, 2 and 3 are identified by writing 1, 2 or 3 next to their names. This sheet is passed to the results recorder who:

- adds the points to the appropriate house totals
- adds the points to the individual students' scores

These results are checked by a second person.

The house points are displayed on a whiteboard at the school sports field for everyone to see. This is updated after each race. The winning house is announced at the end of the day. Points added to individual students' scores at the end of each race are not displayed until the end of the day. Then the winner, the student who has gained the most points during the day, together with second and third placed students are announced. These students are presented with certificates showing their achievements.

### **Description of the proposed computer-based system**

The proposal is to replace all the paperwork by introducing a computer-based race results recording system which will contain all the information described above. A laptop will be used to record the entries and results; the house points totals will be displayed on a large outdoor screen on the school's intranet. Certificates will be printed to be awarded to students at the end of the day. Certificates will also be printed for the winners of each race.

A systems analyst is to be employed to review the existing manual method. The systems analyst will be responsible for drawing up an action plan for the new computer-based system. This will then be designed, tested and implemented. All the necessary documentation will also be produced together with a full evaluation of the system's performance after introduction on sports day.

- 1 (a) Describe what tools exist to help the systems analyst draw up an action plan and ensure that the project is completed on time and to budget.

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.....[4]

- (b) The systems analyst needs to find out about the existing system from the people who record the results of the races.

State **two** methods that would be appropriate to use and explain why the systems analyst should choose those methods.

Method 1:.....

Explanation:.....

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Method 2:.....

Explanation:.....

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.....[6]

- (c) (i) Draw a design for the certificate to be printed for the students who have scored the most points at the end of the sports day.



[6]

- (ii) State the changes you would need to make to the design to adapt it for the winner of an individual race.

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.....[2]

(d) This system requires a laptop computer.

State **one** other item of hardware that is required. Justify your choice for this item.

Item:.....

Why it is needed: .....

.....

.....

.....

.....[3]

(e) Draw a systems flowchart, with a key, to show how the **new** results recording system should work.

(i) Include in your systems flowchart:

- what happens when a student enters a race
- what happens at the end of the race
- what happens at the end of sports day

[8]

(ii) Show in the key:

- **four** symbols that you have used in your flowchart
- a description of the purpose of each of these symbols

<b>Key</b>	
<b>Symbol</b>	<b>Description</b>
	..... .....
	..... .....
	..... .....
	..... .....

[4]

(f) The systems analyst wants to use barcodes to identify the students entering the races on sports day.

(i) Describe the steps taken to allow barcodes to be used to identify students.

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.....[3]

(ii) What benefits would this provide for the new system?

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.....[2]

(g) The systems analyst is choosing software for the new system. He has decided to use generic software packages.

Explain, with reasons, which types of packages the systems analyst should choose.

Software Package 1:.....

Reason for choice:.....

.....  
.....

Software Package 2:.....

Reasons for choice:.....

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.....[4]





(i) Describe a test strategy for the new computer-based system.

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.....[4]

(j) The systems analyst has decided to use parallel running to implement the new system.

Describe what is meant by parallel running and explain why the systems analyst made this choice.

Description of parallel running: .....  
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Reasons for choice: .....  
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.....[4]



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