

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Advanced Level**

## **MARK SCHEME for the May/June 2014 series**

### **9691 COMPUTING**

**9691/33**

Paper 3 (Written Paper), maximum raw mark 90

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

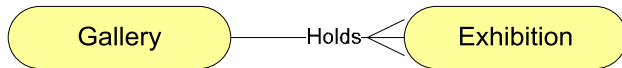
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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- 1 (a) (i) The rule is defined in terms of itself [1]  
(ii) Rule 4 [1]
- (b) (i) Valid – using rules 1 and 4 [1]  
(ii) Invalid – use of rule 4 [1]  
(iii) Invalid - <VarName> must start with a lower case character [1]  
(iv) Valid – Use of all rules [3]
- (c) <Underscore> ::= \_ [2]  
<ConstName> ::= <VarName><Underscore>

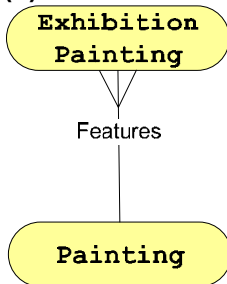
- 2 (a) (i) [1]



- (ii) Gallery (GalleryName, Country) (1)  
2 attributes (1)  
Primary key GalleryName (1)
- Exhibition (ExhibitionTitle, GalleryName, ArtistName, StartDate, CloseDate) (1)  
Correct five attributes (only) (1)  
Primary key ExhibitionTitle (1) [4]

- (b) (i) ExhibitionTitle + PaintingReferenceNo [1]

- (ii) [1]



- (iii) Primary key PaintingReferenceNo in the Painting table (1)  
Links to foreign key PaintingReferenceNo in the Exhibition-Painting table (1) [2]

- (c) Displays the Painting reference number (1)  
For all paintings by artists born after 1899 and died before 2001 (1) [2]

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(d) SELECT PaintingReferenceNo, PaintingTitle (1)  
 FROM Painting (1)  
 WHERE ArtistName = 'Da Vinci'; (1) [3]

(e) UPDATE ExhibitionPainting (1)  
 SET LoanFee = 0 (1)  
 WHERE (ExhibitionTitle = 'Secrets and Silence')  
 AND PaintingRefNo = 9065; (1) [3]

3 (a) A class is the design / the blueprint (from which objects are later created)  
 The class definition consists of properties and methods  
 An object is an instance of a class  
 An object must be based on a class definition  
 Many objects can exist for the same class  
 Properties of an object can only be accessed using methods provided (in the class definition) [MAX 3]

(b) Properties and methods of a base class are available to a subclass  
 A subclass can have properties and methods of its own. [MAX 2]

(c) (i) Recognised notation for inheritance (1)

EVENTVENUE class Address : STRING (1)  
 STADIUM + THEATRE class (and no other subclasses) (1)  
 STADIUM class SportsPlayed : STRING (1)  
 Declared as an ARRAY (1)  
 Capacity : INTEGER (1)  
 AllSeater : BOOLEAN (1)  
 TeamName : STRING (1)  
 Declared as an ARRAY (1)  
 THEATRE class NoOfSeats : INTEGER (1)  
 EventType : STRING  
 Declared as an ARRAY (1)  
 Restarant : BOOLEAN (1)

[MAX 8]

**Note:** No mention of use of arrays scores MAX 7

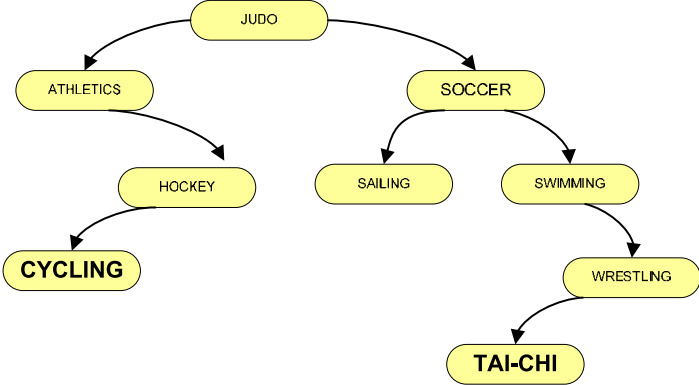
(ii) Mark as follows:  
 EVENTVENUE has Stadio Olimpico + Rome (1)

STADIUM has:  
 Lazio + Roma + National rugby (1)  
 Football and rugby (1)  
 TRUE (all seater) (1)  
 80 000 (1) [5]

4 (a) INTEGER  
 ARRAY[1 : 2000] OF (datatype>  
 OF STRING

[MAX 2]

(b)



[2]

(c)

RootPtr	1
---------	---

	LeftPtr	Data	RightPtr
1	5	JUDO	2
2	3	SOCCER	4
3	0	SAILING	0
4	0	SWIMMING	6
5	0	ATHLETICS	7
6	0	WRESTLING	0
7	0	HOCKEY	0

Root = 1  
 JUDO pointers 5 and 2  
 Six names entered  
 Other pointers correct

(1)  
 (1)  
 (1)  
 (1) [4]

(d)

SearchSport	IsFound	Current
LACROSSE	FALSE	1
		3
		6
	TRUE	

OUTPUT
Moving right
Moving left
Found

[MAX 5]

One mark per entry (MAX 5)

5 (a)  $-95$  [2]  
111

(b) 4057 [2]

(c) 6EF9 [2]

(d) (i)  $-1.75$  give 3 marks  
If answer incorrect mark as follows:  
Exponent: +1 // move the pattern one place  
Mantissa:  $-7/8$   
Answer:  $-7/8 \times 2^1$  // or equivalent [3]

(ii) The mantissa starts with a 10 ... [1]

(iii) 2.0 normalised ...

Mantissa Exponent

0	1	0	0	0	0	0	0
---	---	---	---	---	---	---	---

0	0	0	0	0	0	1	0
---	---	---	---	---	---	---	---

[2]

(iv) Mantissa

Exponent

0	1	1	1	1	1	1	1
---	---	---	---	---	---	---	---

0	1	1	1	1	1	1	1
---	---	---	---	---	---	---	---

Mantissa  
Exponent

(1)  
(1) [2]

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(e) The precision/accuracy is decreased, but ...  
The range of possible numbers is increased [2]

- 6 (a) *Correct use of any of the following:*
- Single segment of wire (1)
  - Terminators × 2 (1)
  - Printer (1)
  - File server (1)
  - Firewall / Proxy server + Indication of a connection to the Internet (1)
  - Router + Indication of a connection to the Internet (1)
  - Modem + Indication of a connection to the Internet (1)
- [MAX 5]

(b) (i) *Intranet ...*  
Information system using Internet protocols  
Provides service of web pages (to client computers)  
// stores content on a web server  
System only available to staff within the organisation [MAX 2]

(ii) *Benefits of an Intranet*  
Localised content available to relevant users only  
Uses standard protocols including HTTP/FTP and email protocols  
Good control over the accuracy of content (unlike the Internet)  
Provides centralised/single source of important company documents [4]

(c) (i) *Symmetric encryption ...*  
Plain text is changed  
Into a cipher text message  
using an encryption algorithm  
The same algorithm (and key) is used to decrypt the message [MAX 2]

(ii)

Claude (W/X)	Sobi (Y/Z)
Claude's Public	Sobi's Private
Sobi's Public	Claude's Public

Any correct × 3 [MAX 3]