

MARK SCHEME for the May/June 2015 series

9691 COMPUTING

9691/33

Paper 3 (Written Paper), maximum raw mark 90

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- 1 (a) (i) The table has a repeated (group of) attributes [1]
(ii) Title, Genre, ReleaseDate and ReviewDate are repeated for each reviewer [1]

(b) (i)

ReviewerID	Location
510	London
808	New York
756	Dhaka

[1]

(ii)

Title	Genre	ReleaseDate	ReviewDate	ReviewerID
Hits 36	P	12/01/2015	01-15	510
Popular Bach	C	12/01/2015	02-15	808
The Messiah	C	11/1/2014	11-14	756

Or, any other row taken from the original table (ReviewerID must be different) [2]

3 correct – 2 marks
2 correct – 1 mark
1 correct only – scores 0

(iii) 9 [1]

(iv) Many-to-one [1]

(v) Primary key/ReviewerID in the REVIEWER table [1]

Links to foreign key/ReviewerID in the REVIEW table [1]

(c) (i) Title [1]

(ii) There are non-key attributes which are dependent (may be stated as part of the attribute description) (1)

ReviewerName is dependent on ReviewerID //

Fee is dependent on Genre

(1) [2]

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- (iii) REVIEWER(ReviewerID, Location, ReviewerName)
 REVIEW(Title, Genre, ReleaseDate,
 ReviewDate, ReviewerID)
 FEE(Genre, GenreFee)

Mark as follows:

new FEE table

containing Genre and GenreFee

Primary key for FEE correctly shown

REVIEW table has foreign key Genre

REVIEWER table contains ReviewerName

[5]

[Total: 17]

2 (a) Syntax diagram [1]

(b) (i) The rule is defined in terms of itself / calls itself [1]

- (ii) TRUE
 FALSE
 FALSE

CAO.

[1]

(c) (i) D175N

Invalid
 5, 2

(1)

(1) [2]

(ii) W058M

Valid

(1)

Rule 1 – 3 times

Rule 2 – once

Rule 3 – once

Rule 4 – once

Rule 5 – once

(1) [2]

(iii) C86N

Invalid

(1)

<producttype><digit><digit><location>

Rule 1 – 2/3 times

Rule 2 – once

Rule 4 – once

Rule 5 – once

(1) [2]

[Total: 9]

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3 (a) *The class diagram includes:*

Software + Network **subclasses** (1)

Bespoke + OffTheShelf **subclasses of** Software (1)

Note: Two marks – correct class names only

Recognised notation for inheritance (from Software and Network only) (1)

Project **class** StartDate : DATE
 ProjectLeader : STRING (1)

Software **class** ProgrammingLanguage : STRING
 AlphaTesting : STRING/CHAR (1)

For each of the following – at least two of the correct properties

Bespoke **class** CustomerName : STRING
 AgreedCost : REAL/CURRENCY
 AgreedDeliveryDate : DATE (1)

OffTheShelf **class** Title : STRING
 BetaTesting : STRING/CHAR
 RetailPrice : REAL/CURRENCY
 SalesForecast : INTEGER (1)

Network **class** ClientName : STRING (1)
 AgreedCost : INTEGER/CURRENCY [8]

(b) (i) *Class...*
The definition of an object // The 'blueprint' from which objects are created. [1]

(ii) *Inheritance...*
The ability of a subclass/child class to use properties and methods of a parent/super/base class [1]

(c) (i) *Instance ...*
– A specific object created from a class (1)
– Main program has created an instance of the Network class – referred to as ThisNetworkProject (1) [2]

(ii) *Method...*
Something an object can do // Implemented with procedures/functions (1)
Project shows two methods – get_ProjectID() and set_ProjectID() (1) [2]

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(iii) *Encapsulation...*

Technique which restricts the programmer's access to the object's data (1)
 Data values can only be read/written using methods provided by the class (1)

– The `ProjectID` value can only be read/written using the two methods provided
`// ProjectID is private to the class` (1) [3]

[Total: 17]

4 (a) Last item in is the first item out // First item in is the last item out
 R. LIFO [1]

(b) PROCEDURE InitialiseStack
 FOR Index ← 0 to 99
 Animal[Index] ← "" (1)
 ENDFOR
 StackPointer ← -1 (1)
 ENDPROCEDURE [2]

(c) (i) "" //empty string (1)
 1 (1) [2]

(ii) PROCEDURE Push
 IF StackPointer = 99 (1)
 THEN
 OUTPUT "REFUSED - stack is full"
 ELSE
 INPUT NewAnimal (1)
 StackPointer ← StackPointer + 1 (1)
 Animal[StackPointer] ← NewAnimal (1)
 ENDIF
 ENDPROCEDURE [4]

(d) PROCEDURE Pop
 IF StackPointer = -1
 THEN
 OUTPUT "Stack is empty"
 ELSE
 OUTPUT Animal[StackPointer]
 StackPointer ← StackPointer - 1
 ENDIF
 ENDPROCEDURE

Mark as follows ...

Test for empty with `StackPointer = -1` [1]
 OUTPUT 'EMPTY' message [1]
 Animal[StackPointer] is value removed [1]
 Decrement StackPointer [1]

[Total: 13]

- 5 (a) (i) –23 (1)
E9 (1) [2]
(ii) 107 (1)
6B (1) [2]
(iii) 127 [1]
(iv) Fewer digits used to represent any number // long string difficult to interpret (1)
Less likely to make a mistake when copying/converting a digit string (1)
Easy to convert from binary/denary to hex (vice versa) (than binary to denary) (1)
[Max 1]

(b)

99	0	1	1	0	0	0	1	1	
29	0	0	0	1	1	1	0	1	+
	1	0	0	0	0	0	0	0	

- 99 and 29 correct pattern (1)
Correct addition // ft (1)
Overflow has occurred // the expected answer is outside the possible range // the answer is showing as –128 (1) [3]

- (c) (i) 1578 [1]
(ii) 1101 is not a valid BCD digit string // 1101 represents '13' [1]

[Total: 11]

- 6 (a) Systems flowchart [1]

- (b) • 1 – Text editor
• 2 – on-screen errors
• 3 – Compiler
• 4 – Assembler
• 5 – Linker
• 6 – Program library code
• 7 – Executable code [7]

[Total: 8]

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- 7 (a) *Correct use of any of the following:*
- | | | |
|--|-----|----------------|
| Single segment of wire | (1) | |
| Computers connected to the cable X 4 | (1) | |
| Terminators X 2 | (1) | |
| Computer C has attached 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) Manage user accounts (1)
- | | | |
|--|-----|----------------|
| Authenticate all logons | (1) | |
| Manage the shared file storage | (1) | |
| Manage the installation and use of applications software | (1) | |
| | | [Max 3] |
- (c) *Intranet ...*
- | | | |
|--|-----|--------------------|
| Information system using Internet protocols | (1) | |
| Provides service of web pages (to client computers) | (1) | |
| Information system only available to staff within the organisation | (1) | |
| | | [Max 2] |
| | | [Total: 10] |
- 8 (a) (i) `ChangeString` (1)
- | | | |
|--|-----|------------|
| <code>ThisString1, ThisString2 (only)</code> | (1) | [2] |
|--|-----|------------|
- (ii) `Ali J` [1]
- (iii) `7 // Error` if `LEFT("", 1)` generates an error [1]
- (iv) `JONES 8` [1]
- [Total: 5]**