Cambridge International AS & A Level

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INFORMATION TECHNOLOGY **9626/04**

Paper 4 Advanced Practical **October/November 2019**

MARK SCHEME

Maximum Mark: 110

Published

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 International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

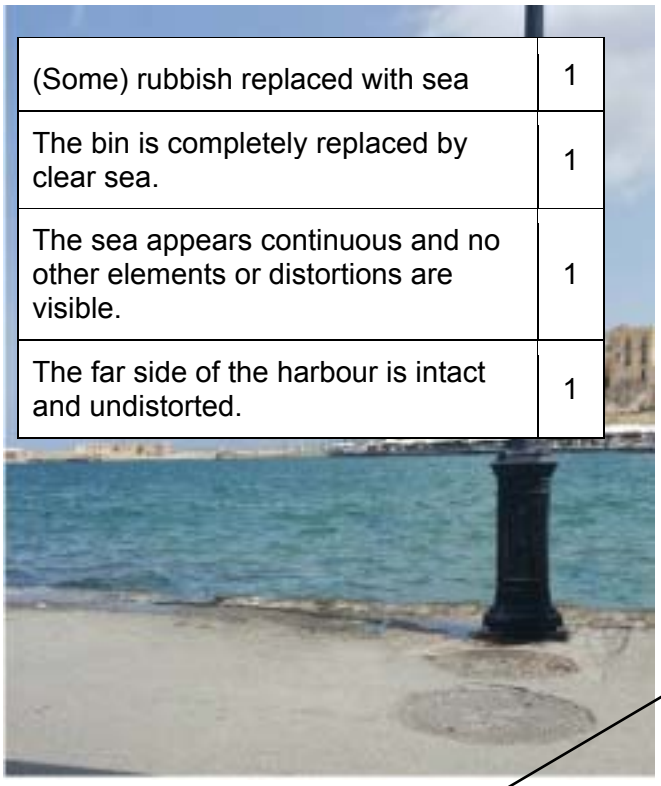
GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Task 1

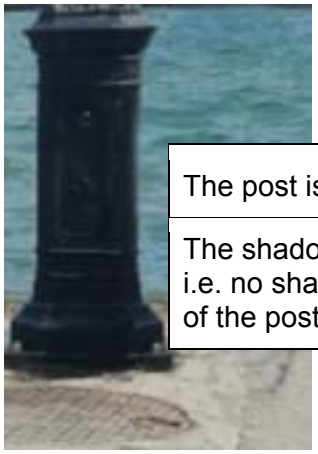


(Some) rubbish replaced with sea	1
The bin is completely replaced by clear sea.	1
The sea appears continuous and no other elements or distortions are visible.	1
The far side of the harbour is intact and undistorted.	1

The path is continuous, no parts of the path are in the sea and there is no sea seen in gaps in the path.	1
The edge stones are in place, with no gaps.	1
The edge stones are single width and are in line with the rest of the path to the left of the post.	1

There is an attempt to repair the right side of the post, the edge is straight and clean.	1
There is an attempt to repair the top dotted ring, with the dots straight.	1
The top dotted ring pattern is continuous and matches the left side.	1
There is an attempt to repair the lower dotted ring, with the dots straight.	1
The lower dotted ring pattern is continuous and matches the left side.	1

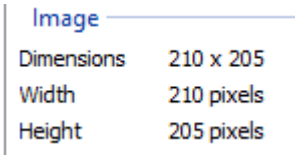
The right top of plinth is repaired and matches the left.	1
Right centre of plinth repair matches the left.	1
Right bottom of plinth repair matches the left.	1
Right base of post repair matches the left.	1
The right nut is shown.	1
The right nut is shown as clearly as the left nut.	1



The post is symmetrical.	1
The shadows are correct i.e. no shadow to the right of the post.	1

[20]

Task 2



The pearl is closely cropped to the top and bottom.	1
The pearl is closely cropped to the left and right.	1
The pearl is cut to Shape. The shape is preserved and not cut into or distorted.	1
The background is transparent. There are no white space fragments.	1
The saved image of the isolated pearl has a width of 210 px	1

[5]

Task 3

For any marks to be awarded, the animation must play.

The Sunset.jpg image is shown as the stage/canvas background.	1
The stage/canvas is set to the correct image size.	1
The text ‘Cheraklia’ is correct.	1
The text is red.	1
The text is in a serif font.	1
The text is approximately the same size as shown in the question paper.	1
The text flies in as one word, smoothly.	1
The text flies in from left and all the text is hidden before the start.	1
The text flies in from behind the sun. It does not fade in, nor is it shown to the left of the sun.	1
The text travels horizontally for 3 seconds only.	1
The final position of the text is correct. Only the top tier of the lighthouse is covered.	1
The final position of the text is exactly as shown. The letter ‘k’ is in front of the lighthouse.	1

The text ‘A pearl in the ocean appears …	1
… after the text ‘Cheraklia’ stops.	1
… immediately after the text ‘Cheraklia’ stops. There is no time lag.	1
The text is white.	1
The text is in a serif font.	1
The text is approximately the same size as shown in the question paper.	1
The pearl image ‘peeks’ from the water; it does not fade in.	1
The pearl image is approximately the same size as shown and ‘peeks’ from the approximately the same position in the sea as shown.	1
The pearl rises to be level with the text.	1
The pearl takes 1 second to travel to the correct position.	1
The animation loops.	1
The animation pauses for approximately 2 seconds before the loop.	1
The animation is saved in a format that will play in a browser (without add-ins).	1

[25]

Task 4(a)

For any marks to be awarded in task 4(a), the scroller must not end on a blank image.

The correction to the code recognises that arrays begin at 0. Examples: var end=Scenery.length-**1**; (counter==end-**1**); (counter==6) Or valid equivalent.	1
When tested, the scroller doesn't begin or end on blank images.	1
The scroller displays images forwards and backwards - on first click.	1
The correct Alert displays at the end – clicking Next (forwards).	1
The correct Alert displays at beginning – clicking Previous (backwards).	1

[5]

4(b)

The beginning alert is removed – Tested by 1st click on Previous.	1
The scroll still works clicking Next (forwards).	1
The scroll still works clicking Previous (backwards).	1
The end alert is removed – Tested by 7th click on Next.	1
The scroll works continuously on clicking Next (forwards).	1
The scroll works continuously in either direction.	1

[6]

4(c)

The text 'Enjoy our wonderful beaches' shows under the 1st image at the start.	1
The text 'Watch our varied wildlife' shows under the image after 1st click on Previous.	1
The text matches the Bird image.	1
The correct text is displayed for all images.	1
Each text is 100% accurate.	1
All the text is in the same place and in the same format.	1
All the images and text still cycle correctly.	1
An Array is created for the descriptions text. (Efficiency)	1
Comments are inserted using the correct syntax. //	1

[9]

An example of a solution for task 4(c)

```
<script>
 Var Scenery=["Beach.jpg","Diving.jpg","Mountains.jpg","Rainforest.jpg","Ruins.jpg","Sea.jpg","Wildlife.jpg"]
 var text=["Enjoy our wonderful beaches","Dive on our coral reef","Drive through our beautiful
mountains","Trek through our lush Rainforest","Tour our ancient Roman ruins","Cruise our
islands","Watch our varied wildlife"]
//creates new variable for text descriptions
// must have same number of elements as the scenery variable
 var counter=0;
 var end=Scenery.length-1;
//arrays are numbered from zero so 1 deducted from length to get correct number for final
image
 document.getElementById("description").innerHTML="Scroll through our breathtaking scenery";
// allowed to remain as initial text- could be replaced with Enjoy beaches etc

 function forward(){
 if (counter==end){
 counter=0;} //reset counter to zero so scroll continues
 else {
 counter++;}
 document.getElementById("pic").src=Scenery[counter];
 document.getElementById("description").innerHTML=text[counter];
 //inserts correctly numbered text at description attribute
 }

 function back(){
if (counter==0){
 counter=end;}  //reset counter to end variable so counter will cycle
 else {
 counter--;}
 document.getElementById("pic").src= Scenery[counter];
 document.getElementById("description").innerHTML=text[counter];
 }
</script>
```

Task 4(d) – an evaluation of the scroller as shown in Fig. 4.1

Any 3 valid comments such as: Clear and simple / Unattractive and too simple Easy to use / unnecessary manual scroll Attractive images and scope / Boring images and limited scope Background clear and uncluttered / background too plain.	3

1st 3 marks for the evaluation are for comments about the functionality and use of the scroller, NOT about its purpose.

Any 2 valid suggestions such as: The need for more images - Include videos Use a colourful background Include longer descriptions Include more details of locations or attractions.	2

[5]

Task 5

Task 5(a)(i)

Table is in unnormalised form because: There are multiple items in Villa Class/Name fields – It is not possible to set a primary key.

[1]

Task 5(a)(ii)

Suitable Table in 1st Normal Form.

Villa Class	Villa Name	Cost (per day)	Service (per day)
Bijou	ACHIMA	€120	€ 6.00
Bijou	MEDEIA	€120	€ 6.00
BijouPlus	ACHIMA	€150	€ 7.50
BijouPlus	MEDEIA	€150	€ 7.50
Standard	ARIADNE	€150	€ 7.50
Standard	MEGAIRA	€150	€ 7.50
Luxury	ANDROMADE	€270	€ 13.50
Luxury	MEDOUSA	€270	€ 13.50
Ultimate	APOLLONIA	€400	€ 20.00
Ultimate	MARTHA	€400	€ 20.00

The table must have unique key.

Vill_id	Villa_Class	Villa_Name	Cost (per day)	Service (per day)
1	Bijou	ACHIMA	€120	€ 6.00
2	Bijou	MEDEIA	€120	€ 6.00
3	BijouPlus	ACHIMA	€150	€ 7.50
4	BijouPlus	MEDEIA	€150	€ 7.50
5	Standard	ARIADNE	€150	€ 7.50
6	Standard	MEGAIRA	€150	€ 7.50
7	Luxury	ANDROMADE	€270	€ 13.50
8	Luxury	MEDOUSA	€270	€ 13.50
9	Ultimate	APOLLONIA	€400	€ 20.00
10	Ultimate	MARTHA	€400	€ 20.00

The creation of a Villa_id would be acceptable for this mark.

[1]

Task 5(a)(iii)
Identify and describe a primary key that could be set.

The efficient solution is for the Primary key to be set as a Composite key using Villa Class/Name as shown. A primary key set as Villa_id, shown in a table as above, is acceptable for 1 mark. **Stating** that the primary key is Composite/Concatenated is necessary for the 2nd mark.

[2]

Task 5(a)(iv)

The data in the table is not in 2NF because: The **Cost** and **Service** fields depend on the **Villa Class** but not the **Villa Name** i.e those fields are not dependent on the **whole** key.

[1]

Task 5(b)(i)

Tables showing the data in 2NF

Villa Class	Villa Name
Bijou	ACHIMA
Bijou	MEDEIA
BijouPlus	ACHIMA
BijouPlus	MEDEIA
Standard	ARIADNE
Standard	MEGAIRA
Luxury	ANDROMADE
Luxury	MEDOUSA
Ultimate	APOLLONIA
Ultimate	MARTHA

Villa Class	Cost (per day)	Service (per day)
Bijou	€120	€ 6.00
BijouPlus	€150	€ 7.50
Standard	€150	€ 7.50
Luxury	€270	€ 13.50
Ultimate	€400	€ 20.00

The mark is for creating the 2nd table as shown here.

[1]

Task 5(b)(ii)

Describe any additional primary keys that could be set.

The Primary key for the second table is **Villa class**.

[1]

Task 5(b)(iii)

Explain why the structure of this data is not in 3NF.

The structure of the data is not in 3NF because:

The **Service** field depends on the **Cost** field but not the **Villa Class.**
i.e. the **Service** field is not dependent on the primary key.

[1]

Task 5(c)(i)

Tables showing the data in 3NF.

Villa Class	Villa Name
Bijou	ACHIMA
Bijou	MEDEIA
BijouPlus	ACHIMA
BijouPlus	MEDEIA
Standard	ARIADNE
Standard	MEGAIRA
Luxury	ANDROMADE
Luxury	MEDOUSA
Ultimate	APOLLONIA
Ultimate	MARTHA

Villa Class	Cost (per day)
Bijou	€120
BijouPlus	€150
Standard	€150
Luxury	€270
Ultimate	€400

Cost (per day)	Service (per day)
€120	€ 6.00
€150	€ 7.50
€270	€ 13.50
€400	€ 20.00

The mark is for creating the 3rd table as shown here.

[1]

Task 5(c)(ii)

Describe any additional primary keys that could be set.

The primary key for the third table is **Cost (per day)**. – **Only**

[1]

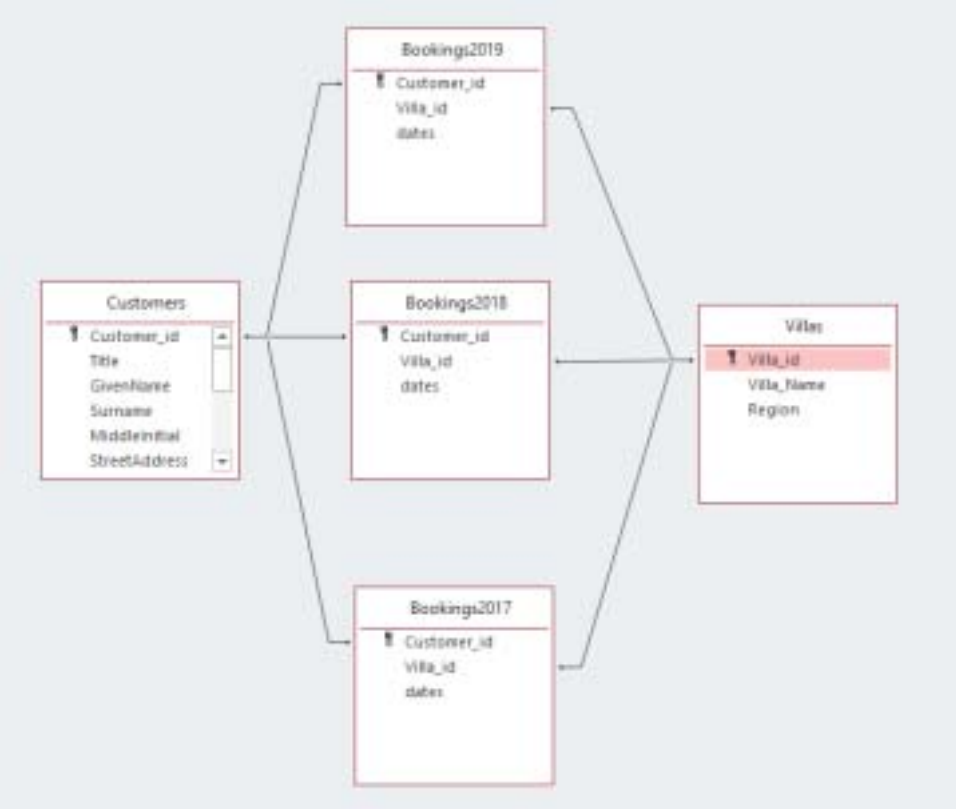
Candidates need to demonstrate that they understand that for tables to be in 3NF:

- No non-key field depends upon another non-key field
- All non-key fields depend **only** on the (**whole**) primary key.

Task 6(a)

5 tables are imported with no Import errors	1
The fields in the Customers table are correctly named. (All and only)	1
All data in the Customers.ZipCode field are in Upper Case.	1
All data in the Customers.Email field are in Lower Case.	1
The Customers.CCnumber field is set to text.	1
The Customers.TelephoneNumber field is set to text.	1
The Customers.Birthday field is set to Date/Time.	1
The Customers.CCExpires field is set to Date/Time.	1
3 × Customers.Customer_id to Bookings.Customer_id relationships are set as shown in the following relationships diagram.	1
3 × Villas.Villa_id to Bookings.Villa_id relationships are set as shown in the following relationships diagram.	1
All Tables (Bookings, Customers, Villas) have Primary keys set.	1

[11]



Task 6(b)

The Regulars report has a black header as shown in the question paper.	1
The text in the header is white.	1
The title, 'Customers who booked in all 3 years', is correct.	1
The correct field names are displayed.	1
The villa names are displayed, (not the Villa_ids).	1
Data for all 3 years are displayed.	1
… The report is displayed as shown in the question paper.	1
… The report is displayed in portrait orientation.	1
The correct records are displayed – 90 records – Ascending on Surname.	1

[9]

Customers who booked in all 3 years

Customer id	GivenName	Surname	2017 Villa	2018 Villa	2019 Villa
2930	George	Archer	EUMELIA	KORA	KARME
2460	Harley	Atkins	NIKEPHOROS	KHARIS	MAIA
4260	Adam	Atkinson	ZENIA	PSYKHE	TISIPHONE
4209	Faith	Barrett	ILITHYIA	ÒIONÒ	TITANIA
2847	Nathan	Berry	DAMALI	RHOD?	AELLAI
1514	Jennifer	Booth	NEPHELÒ	EUTROPIA	IEZABEL
3982	Lara	Brown	TYRO	BETHZATHA	EURYDIKE
4093	Naomi	Browne	KURIA	OLYMPIA	SAPPHEIRE
1863	Bailey	Bull	NATµSA	BERENIKE	SOPHIA
3445	Sam	Carey	MNÒMÒ	BETHANIA	MEDEIA
3845	Kian	Carter	PÒRâ	ZOE	KYRIAKE
3793	Ewan	Chamberlain	ANEMONE	GIA	CHARIKLO
3872	Adam	Clark	IOKASTE	DAMALIS	MYRINA
4227	Emma	Clayton	REAH	KALLIOPE	SAPPHIRA
4088	Louie	Cole	EUTHALIA	KORINA	HEMERA
2171	Aaron	Coleman	MELETÒ	ENYO	FOTINI
3914	Jayden	Coles	THANA	EURYNOME	PARASKEVE
3075	Chelsea	Connolly	PHOIBE	KORINA	SELENE
1569	Adam	Cook	DELIA	EILEITHYIA	XANTHIPPE
2467	Phoebe	Cook	PHAIDRA	GALÒNÒ	KYRIAKI
2443	Matilda	Cooke	LEUKOTHEA	KUMA	PROKRIS
2058	Summer	Cooper	HELLE	CALLIDORA	ANDROMACHE
2685	Brandon	Daly	ELPIS	HYPATIA	TANIS
3821	Nicholas	Daniels	ALKIPPE	H?SANNA	DORRIS
1859	Jennifer	Davey	HYDRA	EUROPE	APPHIA
3550	Toby	Duffy	SAPPHO	TANIS	THEOKLEIA
3031	Zoe	Duncan	LIGEIA	KASSIOPEIA	APOLLONIA
1414	Adam	Edwards	ELPIDA	PERSIS	ELEKTRA
3079	Zak	Ferguson	LYSISTRATE	LAKHESIS	PANAGIOTA
2239	Ewan	Fitzgerald	LAMIA	KLYMENE	THETIS
3774	Mohammed	Fleming	PSYKHE	VASILIKI	ZENOVIA
3556	Tom	Forster	THALEIA	ELPIS	OLYMPIA
2340	Mia	Fowler	LÒTâ	PHOIBE	NEPHELÒ
3473	Billy	Godfrey	PHILYRE	LÒTâ	KHRYSEIS
1583	Laura	Harding	KHRYSEIS	TALITHA	DANAÓ
1961	Isobel	Hardy	HELLE	DIONYSIA	PHILOMELA

Customer id	GivenName	Surname	2017 Villa	2018 Villa	2019 Villa
4280	Rhys	Harvey	DARIEA	EVGENIA	PHANESSA
2265	Jasmine	Hayes	ALKYONE	SIBYLLA	EUDORA
3329	Jay	Heath	MARGARITES	THEODORA	KUMA
1910	Lucy	Hewitt	STAMATIA	DESPOINA	OLIMPIA
2231	Adam	Hill	KETO	HYSANNA	ANDROMACHE
2329	Molly	Holmes	ANASTASIA	KHRYSEIS	KHLORIS
4155	Mohammad	Hunt	ANASTASIA	ALKYONE	IEZABEL
1926	Isabelle	Hurst	MEDEIA	AGAVE	MELINA
2001	Ruby	Hutchinson	AKELDAMA	PÓRŠ	ADEDE
2585	Joshua	Hutchinson	CHARA	AELLAI	SOFRONIA
2725	George	Jackson	ARIADNÓ	TABITHA	POLYXENE
2877	Abbie	Kay	ADELFA	ISMÓNÓ	PSYKHE
1389	Freya	Kent	ÒIONÒ	AMPHITRITE	TIMO
3710	Alice	Kerr	TETHYS	MYRRINE	HALKYONE
4309	Courtney	Knight	NEMESIS	BETHESDA	AGATHE
3677	Mohammad	Lambert	DELPHINIA	PHILOMENA	AMINTA
1567	Elliot	Lawson	KASSIOPEIA	ANTHEIA	HELLE
3374	Megan	Leach	PHILYRE	GOLGOTHA	TERPSIKHORE
3469	Taylor	McDonald	RHOUTH	NANA	EUMELIA
3257	Laura	McLean	DAPHNE	THANA	MARGARITES
2692	Finley	Metcalfe	PHILLIDA	ASPASIA	THETIS
2708	Elliot	Nicholls	AKAKALLIS	THETIS	AMBROSIA
3954	Abby	North	HÒBÒ	POLDNA	RHAAB
2476	Charlie	O'Neill	SOPHIE	THEA¡Short	GE
2856	Sophia	Parkin	TRYPHAINA	THEKLA	EIDOTHEA
2834	Millie	Powell	KALUSTÒ	SIBYLLA	PARTHENIA
2440	Jodie	Powell	THETIS	THYONE	HÒR¶
4286	Ellie	Power	IANTHE	ANDROM?DE	ADONIA
4275	Paige	Pritchard	TERPSIKHORE	HEKATE	DEMETER
3224	Charles	Pugh	DISDEMONA	EUGENEIA	HIPPOLYTE
3665	Daniel	Rees	KURIA	HERO	KHLORIS
2400	Demi	Reynolds	MELETÒ	POLYXENE	DAMALI
3736	Cameron	Richards	MEDOUSA	HELN?	ANASTASOULA
3815	Muhammad	Richards	TYRO	LEUKOTHEA	MNÒMOSYNÒ
3697	Noah	Robertson	XENIA	SKYLLA	HALKYONE
3204	William	Robson	KORINA	PHERENIKE	RHOUTH
3131	Lucas	Rose	HEKATE	EFROSYNI	EUTERPE
3139	Joe	Rose	ANEMONE	EKHO	KURIA

Customer id	GivenName	Surname	2017 Villa	2018 Villa	2019 Villa
4216	Sam	Ross	SKYLLA	ZENOVIA	ÒIONÒ
1875	Ellie	Rowley	SAPPHEIRE	XENIA	HERO
2376	Spencer	Ryan	KURIA	KUMA	AGLAIA
2748	Jack	Ryan	EUDOXIA	PHYLLIDA	SAPPHEIRE
2273	Archie	Saunders	MELAINA	PANDORA	OLYMPIA
2918	Sarah	Shaw	SIBYLLA	LEUKOTHEA	KLYMENE
4130	Louise	Smith	TIMOTHEA	SPYRIDOULA	FRONA
4289	Isabel	Steele	DIDO	TRYPHOSA	EIDOTHEA
4193	Freddie	Swift	ASPASIA	PHILOMELA	PERSIS
3867	Tilly	Wallace	MELISSA	EVA	XENA
1610	Alex	Walsh	PERSEPHONE	KALLIOPE	XANTHÒ
3922	Oscar	Ward	APHRODITE	EUMELIA	PODARGE
2595	Freya	Warner	POLYXENE	ANDROMACHE	OLIMPIA
2634	John	Warner	EOS	SIBYLLA	LAVRA
2514	Chloe	Watts	KALYPSO	ELPIDA	PHERENIKE
3112	Aaliyah	Yates	MARGARITES	FOTEINI	ALALA

Task 6(c)

The None 2017 report header and title are correct and as shown in the question paper.	1
The correct field names are displayed. (Villa_id, Villa_Name, Region)	1
The Villas are ordered, ascending on Region.	1
The report is displayed as shown in the question paper.	1
The correct records are displayed. (28 records - 1 page)	1

[5]

Villas not booked during 2017

Villa_id	Villa_Name	Region
211	PLÒIONÒ	Amorgos
166	HANNA	Amorgos
234	HELN?	Anafi
91	AIKATERINE	Andros (town)
220	PROKRIS	Andros (town)
111	PTOLEMA	Ano Syros
198	HESTIA	Antiparos
158	SAPPHIRA	Donousa
64	IOANNA	Donousa
137	IPHIGENEIA	Drymalia
231	SOTIRIA	Exomvourgo
374	SPYRIDOULA	Folegandros
65	KHLOE	Ios
115	KLYMENE	Irakleia
225	THEKLA	Irakleia
297	THEODOSIA	Irakleia
310	THEOPHILA	Kimolos
377	DIÀNÒ	Kimolos
191	XANTHÒ	Kythnos
189	ARISTOMACHE	Kythnos
102	ZONA	Mykonos
345	MELITE	Panormos
93	ASTRAIA	Paros
273	NANA	Paros
318	MINTHE	Paros
235	EURYBIA	Sifnos
96	PARTHENOPÒ	Sikinos
284	BETHZATHA	Tinos