<u>Database and file concepts – AS 9626</u>

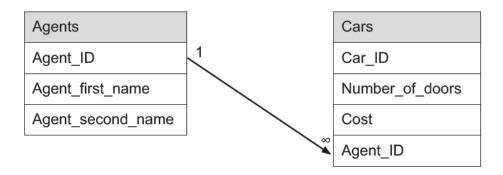
1.	Nov/2021/Paper_11/No.11
	Normalisation is often used to refine the structure of a relational database.
	Describe four advantages of using normalisation.
	[4]
	Car
	Palpacal

Here is an extract from a table which is part of a relational database. It requires the use of a compound key.

Studentid	Second_name	Coursecode
L03127	Gimenez	MAT
L03218	Driscoll	CHE
L03313	De Silva	PHY
L03214	Alicante	BIO
L03127	Gimenez	CHE

Analyse, including its effectiveness, the function of a compound key. Reanswer.	efer to the extract in your
	%
X Q	
70	
10,0	
	[6]

The sales director of a large company buys cars from an agent before issuing them to managers for use as company cars. She needs to keep records of all the agents she deals with and the details of each car. The records are stored as a relational database consisting of two tables.



A typical record from the Cars table would be: S8562T, 5, \$39500, B345

(a) Using the information given above, complete this part of the data dictionary for the Cars table.

Attribute	Data type	Format	Type of key
Car_ID		101.	
	- 4		
		,0	

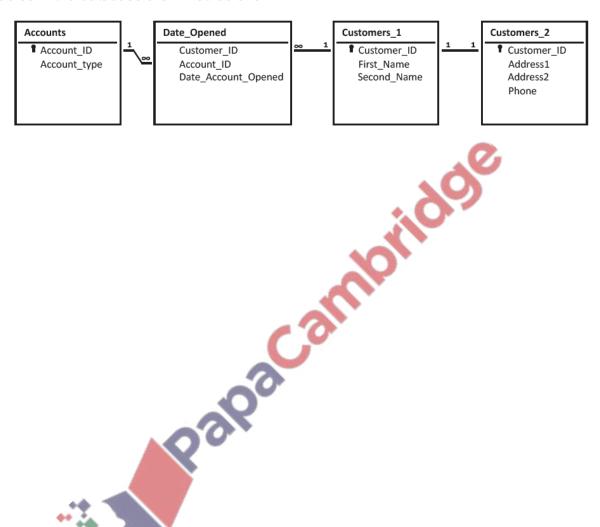


(b)	Evaluate, by weighing up the advantages and disadvantages, the use of a relational database rather than a flat file database in this situation.				
	[6]				
(c)	The sales director wishes to find the details of the agent who sold her the car with an ID of R4962Z. She has used a static parameter query to find these details.				
	Explain why she should have used a dynamic parameter query.				
	[4]				

A bank keeps the following information about its customers and accounts in a database:

- all the types of account customers can open
- details of when customer accounts are opened
- the names of each customer
- customers' contact details.

Tables in the database are linked as shown:



(a)	Describe, in detail, how the tables are connected and the possible relationships that exist within the database.
	[8]

and then da	and then data was entered.						
The softwar	The software rejected the relationships as they were being set up.						
Describe tw	Describe two reasons the software would have rejected the relationships.						
1	1						
2							
	[2]						
Mar/2021/Paper 1	2/No.4				9		
A sports club so computer. The	Mar/2021/Paper_12/No.4 A sports club secretary has entered data from a source document into a database on his own computer. The original document contains correct data but he made some errors when copying						
the data into th currency.	e database. M	lembership num	nber	is text data typ	e and Membe	rship fee paid is	
Membership number	Date of birth	Membership fee paid (\$)	3	Membership number	Date of birth	Membership fee paid (\$)	
45237	13/04/1996	35		45237	13/04/1996	35	
34859	09/12/1998	46		3485	09/12/1998	46	
28695	12/11/1992	43		28695	12/12/1992	43	
61892	01/02/2001	12		61892	01/02/2001	12	
56123	27/06/1999	15		56123	27/06/1999	5	

Database

(b) The tables were created with the field names shown. The field names were assigned correctly

The three errors were:

5.

15 has been copied as 5 34859 has been copied as 3485 12/11/1992 has been copied as 12/12/1992

Source document

(a)	(i)	Explain, in detail, why one of the errors could only have been detected using verification.
		[2]
	(ii)	Describe the most appropriate method of verification that could be used to trap this error.
		[1]
(b)		each of the other two errors, describe the most appropriate validation check which would e trapped the error.
	1	
		<u> </u>
	2	
		[2]

Mar/2021/Paper_12/No8
Explain how the reporting feature of a management information system (MIS) helps an organisation in the running of its business.
·····
[5]
··ii J

6.

7.	Mar/2021/Paper_12/No.11 When creating queries in a database, a function IIf() is often used. IIf is equivalent to the IF function found in spreadsheet software.
	Examine the following database query.
	Ilf([Examdate]>Date(),"not yet",Ilf([Examdate]=Date(),"today's the day","you've missed it"))
	Date() returns the current date. [Examdate] is written as "Examdate" in some software.
	Describe, in detail, what the database query does.
	[4
	Po.

A company stores records of its employees in alphabetical order of name.			
Explain what is meant by the indexed sequential access method, describing how it could be used to retrieve the records of employees named Patel.			

[8]			

8. Mar/2021/Paper_12/No.13

9. June/2021/Paper_11/No.9

Metropolis City Library stores details of its books and borrowers in a database. Part of the Borrowers table is shown in Fig. 9.1.

4	BorrowerID ▼	FamilyName ▼	FirstName ▼	Phone ▼	Town_lived_in ▼
	1	Gale	Clemantine	01164960567	Mintair
	2	Brown	Christine	01134960965	Redleigh
	3	Leadbetter	Karla	07700900863	Lowtown
	4	Brierley	Fred	01134960675	Redleigh
	5	Greenhalgh	Ben	01164960001	Mintair
	6	Pooley	Christopher	03069990694	Armley
	7	Chalmers	Rio	07700900900	Fromman
	8	Lewis	Ruksana	08081570945	Lowtown
	9	Patel	Angela	09098790142	Fromman
	10	Bopal	Udoka	01614960836	Lowtown
	11	Akula	Billy	01914980487	Armley
	12	Benson	Wesley	01845632545	Lowtown
	13	Breen	Wally	01915647379	Armley

Fig. 9.1

The librarian has created the following query:

				to the second se	
Field:	BorrowerID	FamilyName	FirstName	Phone	Town_lived_in
Table:	Borrowers	Borrowers	Borrowers	Borrowers	Borrowers
Sort:					
Show:		<	V		✓
Criteria:		Like "B*"	4 0		<>"Lowtown"
or:		- 3			
		-			

Fig. 9.2

(a)	(i)	Explain what information the librarian is looking for when using the query in Fig. 9.2.
		Pala Pala Pala Pala Pala Pala Pala Pala

	(ii)	(ii) Identify the information that the query would output using the data in Fig. 9.1.						g. 9.1.
								[1]
Pa	art of th	ne Books	table is sh	own in Fig. 9.3	3.			
ISE	BN ▼	Titl	le ▼	Author	•	Publisher ▼	NumberofCopies ▼	Replacement Cost ▼
9780577	7185273	Ruinous Ora	nge	Jonathon Roberts		Ellipsoid	3	\$16.99
9780593	3039427	That Was Th	en	Jaswant Sandhu		Round Moon Publishers	4	\$10.00
9780593	3065907	The Cheap S	Strangers	Reeta Khan		Round Moon Publishers	1	\$18.99
	2856006	Too Open To		Paul Stevenson		Douglas Books	2	\$16.99
	6892467	The Divide o		Donal Haroldson		Travellor Books	2	\$19.99
	9187276	Light and Da		Gabrial Aston		Betelgeuse	2	\$18.99
	1196873	Never the Po		Jaswant Sandhu		Round Moon Publishers	3	\$18.99
	2460886	Gloom Broth		Rowena Littleton		Douglas Books	1	\$20.99
	2469285 0835991	Tempest Bro Ambuscade	urei	Rowena Littleton		Douglas Books Possum Books	2	\$13.99 \$12.99
	1254293	Significant N	umhors	Hortense de Vandre Jan Tudor		Frowpile Books	4	\$17.99
	6962345	Respeto por		Celia Rodriguez Possum Books		4	\$9.99	
Tł	ne libra	rian has o	created the	e following que		g. 9.3		
Field	ISBN		Title	Author		Publisher	NumberofCopies	ReplacementCost
Table			Books	Books	4	Books	Books	Books
Sort Show		П	✓		7		\square	
Criteria				Like "*son				
or					1			< 10
(b) (i)	Explain v	vhat inforn			g. 9.4 In is looking for whe	en using the que	ry in Fig. 9.4.

(ii)

10. June/2021/Paper_11/No.10

A company is creating a database to record information about each employee. The IT manager is creating an on-screen data entry form that will be used by the Human Resources department. This is her first design:

Name
Address
Date of birth
Gender
Date joined company
Salary
Cambridge
Describe, in detail, appropriate improvements that could be made to the form to make data entry more accurate and easier to complete.

[8]

11.	June/2021/Paper_11/No.11
	Explain, using examples, what is meant by the term generic file format.
	[3
12.	June/2021/Paper_11/No.12
	Describe, in detail, what is meant by a hierarchical database management system.
	Co

	[4]

A common feature of many database systems is the use of switchboards.
Evaluate, by weighing up the advantages and disadvantages, the use of switchboards in such systems.
[6

13. June/2021/Paper_12/No.8

14. June/2021/Paper_12/No.9

GoodHope Ltd uses computers to process its payroll. The company pays its workers weekly, which involves the updating of a master file.

Part of a transaction file is shown. It contains workers' ID numbers and the hours worked by those workers in a particular week.

Part of the master file used by the company is shown. It contains the workers' ID numbers and the hourly rate at which they are paid in \$.

Transaction file

ID_number	Hours_worked
25306	35
25376	40
25891	37
27813	40
28197	35
32678	40
33429	37
36802	38
38439	38
39286	40

Master file

ivias	ster file
ID_number	Hourly_rate
13487	26
25306	25
25376	25
25891	24
26145	25
27813	22
28197	23
31026	22
32678	26
33429	22
36802	21
38439	25
39286	24
39875	25

(a) The transaction file has been sorted so that the updating can begin.

Describe what other process must happen before updating can begin.

_	_	_	_	

Joa sho	nne has created a spreadsheet using proprietary software. Paula has suggested that she uld save it in an open-source file format.
(a)	Describe three distinct features of proprietary software.
	[3]
(b)	Describe two distinct features of an open-source file format.
	[2]

15. June/2021/Paper_12/No.12

16. June/2	2021/Paper_13/No.11
Explain of se	ain what is meant by normalisation. Include in your answer a description of the characteristics econd normal form (2NF) and third normal form (3NF).

A management information system (MIS) can be used to produce reports.
Describe other features of a management information system (MIS).
[5]
Palpa

17. June/2021/Paper_13/No.12

Below are tables from a university database of Metallurgy students. Relationships link the tables.

Students

Studentid	Phone	Second_name
A5384	01217421600	Bhatti
A6528	01213689624	Schmidt
B7238	01214016620	Jones
A8946	01214006451	Gonzales
D9476	01214016620	Jones

Courses

Studentid	Subject	Teacher_code
A5384	Geology of metals	SMI
A6528	Electrochemical Metallurgy	LOU
B7238	Geology of metals	RIC
A6528	Metallography	SAN
D9476	Physical Metallurgy	SAN

Teachers

Teacher_code	Subject 1	Subject 2
LOU	Electrochemical Metallurgy	Metallography
RIC	Geology of metals	Crystallography
SAN	Metallography	Physical Metallurgy
SMI	Electrochemical Metallurgy	Geology of metals
TUR	Crystallography	Geology of metals

(a) Define, exactly, each of the following terms giving examples of the only suitable fields for each, using the tables provided.

(i) •F	Primary	key				
	-					

. •

(ii)	Foreign key
	[3]
(iii)	Compound key
	A0'04
	[3]

b)	connecting these tables. You can assume the tables were already populated with data.
	[4]
c)	Describe, in detail, the two validation checks that could be carried out on the Studentid field which could not be carried out on the Second_name field.
	[3]

19.	Nov/2020/Paper_11/No.11
	Amir has created a student database query which allows users to type in any name they choose and then the query finds everybody in the database with that name.

Annisa has told him that this is a dynamic parameter query.

	ghing up tic parame			nd disadv	antages,	dynamic	parameter	queries
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				7				
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 		201		•••••				
 		S						
 ***			•••••					[0

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A secretary has been asked to add the data of three new employees to his company's database of employee records.

28/10/2019

These include payroll numbers and the date these employees joined the company:

	K68932 M40932	11/11/2019 30/12/2019
Analyse the effe	ectiveness of limit checl	ks on the upper limits and format checks in validating this
		. 300
		- D
	100,	
······································		

A company selling desktop computers uses batch processing to process its customer orders. The company updates the stock master file every week.

Two sets of data are shown below.

The first set represents part of a transaction file containing the computer ID numbers and either the total number of items sold to customers or the amount of new stock delivered to the company in a particular week. The type of transaction is given a code of either S or D. S means that the number of computers in stock needs to be reduced. D means that new stock needs to be added.

The second set represents part of the master file used by the company. This shows the computer ID numbers, the make of computer, the hard disk size and number in stock.

Transaction file

ID_number	Quantity	Туре
D20992	40	D
D43487	45	S
D87214	36	S
M47155	43	S
M75860	76	D
R03272	55	S
R62925	92	S
S32249	67	S
S47700	85	D
T49443	61	S

Master File

ID_number	Make	Hard_disk	Number_in_stock
D15609	Dingly		162
D20992	Dingly	1.5	145
D43487	Dingly	2	120
D87214	Dingly	3	150
M47155	MBI	1	135
M75860	MBI	2	158
M94382	MBI	4	182
R03272	Rickard	1	147
R55530	Rickard	1.5	126
R62925	Rickard	2	181
S32249	Sensen	2	130
S47700	Sensen	3	167
T49443	Trudel	1	122
T88350	Trudel	4	158

Using this data, explain the steps involved in updating the master file using this transaction file for both types of transaction. You may assume that the transaction file has already been validated and sorted.
[8]

Select the most appropriate data type for each of the following examples, giving a reason why alternative data types would not be suitable. If the data type is numeric, specify the type of numeric data that would be most appropriate and give a reason. The reasons must be different for each example.

(a)	A phone number, such as 028 9649 6437	
(h)	A number used to show the fraction of students who like IT, such as 0.125.	[1]
(~)	Attributed used to show the fraction of students who like 11, such as 0.120.	
		[1]
(c)	The number of children in a family, such as 4.	
	180	[1]

	(d)	A person's state of employment, such as employed or not employed.
		[1]
	(e)	The amount of money a person earns, such as \$100.50.
		[1]
23.		/2020/Paper_12/No.10 re are several different generic file formats which can be used to save data.
	Eva	luate, by weighing up the advantages and disadvantages, the use of txt format to save data.
		10°
		[6]

Many companies use management information systems (MIS).
Without describing the role of the MIS manager, describe how other managers within a company would use MIS.
[6]

Below are tables from a university database of Metallurgy students. Relationships link the tables.

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SMI	Electrochemical Metallurgy	Geology of metals
TUR	Crystallography	Geology of metals

(a) Define, exactly, each of the following terms giving examples of the only suitable fields for each, using the tables provided.

(i)	mary key	

(ii)	Foreign key	
		. [3]
(iii)	Compound key	
	AQ.	
	Co	
		. [3]
		. [O]

-	connecting these tables. You can assume the tables were already populated with data.
	[4
(c)	Describe, in detail, the two validation checks that could be carried out on the Studentid field which could not be carried out on the Second_name field.
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c)	Describe, in detail, the two validation checks that could be carried out on the Studentid field which could not be carried out on the Second_name field.

26. Nov/2020/Paper_13/No.11 Amir has created a student database query which allows users to type in any

Amir has created a student database query which allows users to type in any name they choose and then the query finds everybody in the database with that name.

Annisa has told him that this is a dynamic parameter query.

Evaluate, by weighing up the advantages a compared with static parameter queries.	and disadvantages,	dynamic	parameter	queries
		O.		
		Ó		
	XC			
	10/1			
	1			
10°				
100				
				[6]
•				[-]

27.	Mar/2020/Paper_12/No.11 Explain why generic file formats are needed when using word processing software and spreadsheet software.
	[4]
28.	June/2020/Paper_11/No.5 A sports club keeps records in a database of its members and the individual sports they play. It has the following tables of data:
	Members' names Members' contact details Details of when they started playing the sport All the possible sports which can be played by the members.
	Names Contact_details Started_sport Sports

	between each adjacent table. Indicate the type of each relationship. Some tables have one relationship and others have a maximum of two relationships. [8]
(b)	Two of the tables could possibly be regarded as having a many-to-many relationship. Using the example of the tables shown above, explain what is meant by a many-to-many relationship.
	Palaka Pa

(a) Complete the tables shown above, writing down examples of the **field names** for **three** of the fields in each table. Indicate the key fields in each table and the relationships that exist

June/2020/Paper_11/No.9
Explain how encryption protects data stored on a hard disk.
[5]
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30. June/2020/Paper_12/No.7

Here is part of a database showing the earnings of a group of workers in a company.

WorkerID▼	Job_type ▼	Hours_worked ▼	Hourly_rate ▼	Weekly_pay ▼
56321	Tyre changer	42	€17.00	€714.00
58191	Foreman	40	€22.00	€880.00
58694	Mechanic	38	€20.00	€760.00
59676	Painter	37	€18.00	€666.00
61230	Sander	39	€15.00	€585.00
63214	Sander	36	€15.00	€540.00
63295	Polisher	38	€14.00	€532.00
64387	Polisher	40	€14.00	€560.00
67152	Mechanic	37	€20.00	€740.00
67328	Painter	36	€18.00	€648.00
68947	Painter	38	€18.00	€684.00

(a)	Describe, using an example from the database, the features of a calculated field.
	29
	C
	[3]

(b)	A number of fields in the database are not shown. Examples of these are first name and family name. In this database the WorkerID is a primary key.
	Explain why it is good practice to have a primary key in this database.
(-)	Describe what a consistency validation check is and explain how it sould be used in this
(c)	Describe what a consistency validation check is and explain how it could be used in this database as a check when inputting data.
	100

	[5]

Ayesha is searching a school database for all the students studying biology. She has used a static parameter query but has been advised to set the query up as a dynamic parameter query.
Describe what is meant by a dynamic parameter query and give the advantages of using one instead of a static parameter query.

31. June/2020/Paper_12/No.10

32. June/2020/Paper_13/No.6

Joanne owns a store which sells films as DVD and blu-ray discs. Each disc has a six-character code number and each customer has an eight-character customer number. She has developed a database system which contains information about the films. Each record contains the following data:

Film title, director, code_number, DVD (Y/N), date_of_sale, customer_number.

Describe the features of an appropriate online data entry form for one film which would, where appropriate, allow the user to enter data by clicking the mouse rather than entering text.

Do not draw the screen and data entry form in your description.
[8]

June/2020/Paper_13/No.11 Describe what is meant by normalisation. Include in your description the properties of first normal form (1NF) and how a table in first normal form can be converted to second normal form (2NF).
[6]

33.

Sujatmi runs a company which stores its payroll records and personal details of its workers in two flat files. She has been told that these files should be converted into a relational database.
By weighing up the advantages and disadvantages, evaluate the differences between a flat file database and a relational database which would help Sujatmi make her decision as to which to use.
rea
[6]

34. June/2020/Paper_13/No.12