

## IS H Exam 2006 - Section I

1. a. This could result in many records having to be changed.  
This could then result in mistakes being made in the updating of some of these records.
2. Other S3 tutors could have the same initials.  
All key values will have to be updated when pupils move to S4.
3. There must be a **non-null, unique** primary key.
4. Pupil number as each pupil has only one value for this attribute.
5. a. Mountains are measured to the nearest metre, there is no need for a decimal point.  
b. Real
6. A Data dictionary provides details about the attributes stored in a databases such as their type, size, validation checks etc.
7. a. 1:1 (One to one)  
b. 1:1 (One to one)

## IS H Exam 2006 - Section I

8. a. Data is raw facts and figures, e.g. 100407.  
Information is data given meaning and context, e.g. the exam date is 10/04/07.
9. A distributed database is one with different tables (files), that are stored at different locations on a network.
10. a. Visual and aggregated.  
b. There is a poor level of detail, such as not displaying the percentage figures.  
There are no numbers to find out who has won.
11. A management information system provides a manager with all the information needed to make make decisions or plan for the future.
12. The company would have to make sure that provisions are in place to support any legacy systems that will still be needed in the company, but may not be able to use the new software as they are too old.
13. a. USA  
b. It is outside the EU and does not have equivalent legislation regarding data protection.

## IS H Exam 2006 - Section II

14. a.

**UNF**

order (customer no  
customer name  
customer address  
customer telephone  
order date  
item number  
number ordered  
description  
supplier name  
supplier address  
supplier telephone  
price)

repeating data

## IS H Exam 2006 - Section II

14. a.

**INF**

customer (customer no  
customer name  
customer address  
customer telephone)

order (order date  
item number  
number ordered  
description  
supplier name  
supplier address  
supplier telephone  
price  
customer no) \*

Table to aid in finding key and identifying partial dependancies (Not required in exam).

Order date	Item No.	No. ordered	Description	Supplier	Sup.	Sup. Phone	Price	Cust. No.
22/4/08	554321	4	DVD player	Acme	Byway	1998232	£124.99	1324
22/4/08	554321	2	DVD player	Acme	Byway	1998232	£124.99	1222
25/6/08	554321	7	DVD player	Acme	Byway	1998232	£124.99	1324

ii. Customer key: customer no

Order key: Compound key of order date, item number and customer no.

Foreign key: customer no.

## IS H Exam 2006 - Section II

14. b.

**For 2NF**

customer (customer no  
customer name  
customer address  
customer telephone)

order (order date  
item number  
number ordered  
description  
supplier name  
supplier address  
supplier telephone  
price  
customer no\*)

Table to aid in finding key and identifying partial dependancies (Not required in exam).

Order date	Item No.	No. ordered	Description	Supplier	Sup.	Sup. Phone	Price	Cust. No.
22/4/08	554321	4	DVD player	Acme	Byway	1998232	£124.99	1324
22/4/08	554321	2	DVD player	Acme	Byway	1998232	£124.99	1222
25/6/08	554321	7	DVD player	Acme	Byway	1998232	£124.99	1324

## IS H Exam 2006 - Section II

14. b.

**2NF**

customer (customer no  
customer name  
customer address  
customer telephone)

order (order date  
item number \*  
number ordered  
customer no\*)

item (item number  
description  
supplier name  
supplier address  
supplier telephone  
price)

ii. Customer key: customer no

Order key: Compound key of order date, item number and customer no.

Foreign keys: customer no. and item number

Item key: item number

## IS H Exam 2006 - Section II

14. c.

**For 3NF**

customer (customer no  
customer name  
customer address  
customer telephone)

order (order date  
item number\*  
number ordered  
customer no\*)

item (item number  
description  
supplier name  
supplier address  
supplier telephone  
price)

Table to aid in finding non-key dependancies (Not required in exam).

Item No.	Description	Supplier	Sup.Address	Sup. Phone	Price
554321	DVD player	Acme	Byway	1998232	£124.99
?	?	Acme	Byway	1998232	?
?	?	Acme	Byway	1998232	?

## IS H Exam 2006 - Section II

14. c.

**3NF**

customer (customer no  
customer name  
customer address  
customer telephone)

order (order date  
item number\*  
number ordered  
customer no\*)

item (item number  
description  
supplier name \*  
price)

supplier (supplier name  
supplier address  
supplier telephone)

ii. Customer key: customer no

Order key: Compound key of order date, item number and customer no.

Foreign keys: customer no. and item number

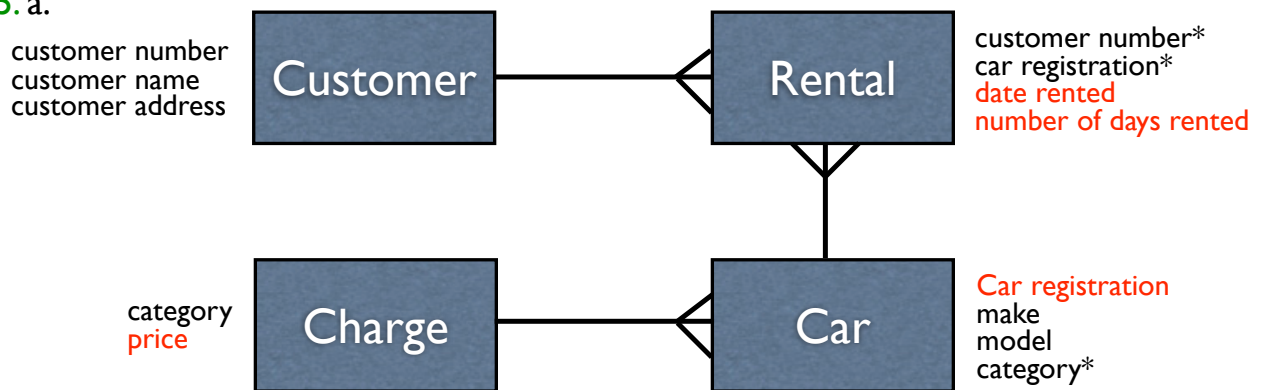
Item key: item number

Foreign key: supplier name

Supplier key: supplier name

## IS H Exam 2006 - Section II

15. a.



b.

	Date	Days	Income
	1/10/05	4	£79.96
	6/10/05	7	£139.93
WZ51 ABC	15/10/05	2	£39.98
	17/10/05	3	£59.97
	29/10/05	1	£19.99
	<b>Total</b>		<b>£339.83</b>

Tables: Rental, charge and car

Attributes: date rented, number of days rented, price, car registration.

(ii). A SUM function will be used to appear in a sub-summary. The function will total the income field which is a computed field multiplying price by number of days rented.

## IS H Exam 2006 - Section II

16. a. The company should consider **frequency**, **storage** and **version control** as part of their strategy.

The frequency should see a daily backup, possibly running overnight as well as an end of the month backup.

For storage the company could use magnetic tape.

Version control would see the company employ a strategy such as Grandfather Father Son. They would also have to decide whether to run a full, differential or incremental backup. If the company have ample storage capacity on the chosen hardware, then a full backup would be run daily.

b. (i). Functionality, usability, compatibility and data migration.

(ii). On the job training and the provision of in-house training.

(iii). User support can be provided by a centralised help desk or by providing a series of Frequently Asked Questions (FAQS) via a web site.

The help desk would be better, as users may have a problem not covered by the FAQs, or they may not be able to understand the advice given in the FAQs. The more interactive nature of the help desk would allow them to clarify any advice that they do not understand.

c. A house style could involve the use of a company logo, specific font type, font size and specific headers and footers.

(ii). Creating a template would be the easiest way to apply a house style.

## IS H Exam 2006 - Section II

17. a. (i). Strategic.

(ii). Gantt chart.

(iii). Project Management Software.

(iv). Resource allocation and critical path analysis.

b. Email - this would allow communications to be sent to others involved in the project.

Contacts - details of team members and clients details could be stored here.

Calendar - Appointment dates can be arranged with clients etc.

## IS H Exam 2006 - Section III

23. a. (i). A decision support system is a mechanism for collating information that is used as part of the process by users allowing allow them to make decisions.

An expert system is designed to provide the actual advice that is used to treat a patient. It uses a knowledge base of facts and rules, and from such the experts system itself infers new knowledge.

b. Category: Advise

Domain: Mineral geology

Main Characteristics: Used fuzzy logic to handle uncertain information.

Produced results matching those of a human very closely.

24. a. This is a suitable problem as there is a restricted domain, allowing all information to be represented effectively.

The nature of the problem is suitable for representing various facts and rules.

b. Do they have sufficient funds to cover the large development costs of such a system? Do they have ready access to the necessary experts to help in developing and testing the system?

c. (i).  $\text{takes}(\text{fiona}, \text{tourism}) \wedge \text{takes}(\text{fiona}, \text{leisure management})$

(ii).  $\forall(x): \text{takes}(x, \text{catering I}) \rightarrow \text{takes}(x, \text{food hygiene}) \wedge \text{in\_class}(x, \text{I023})$

## IS H Exam 2006 - Section III

24. d. Data is represented in a relational database via tables containing records and fields.

Queries are created by the user entering conditions into one or more fields and all data matching the search criteria is returned to the user.

In an expert system data is represented via facts and rules in the knowledge base.

Queries are generated by the user being asked questions via a consultation in the user interface.

Advice is provided in correspondence with the answers that the user gives to these questions. Justification of the advice can also be provided to the user.

e. A deductive database combines the storage and search facilities of a database with the inferencing capabilities of an expert system.

25. a.  $CF_{conclusion} = CF_{rule} \times \min(CF_{condition})$

$CF = 80\% \times \min(90\%, 60\%)$

$CF = 80 \times 60$

$CF = 48\%$

b. The conditions are too draughty will be the given advice.

Of the 3 rules that could fire, this one has the highest certainty (49% as opposed to 40% and 48%).

## IS H Exam 2006 - Section III

25. c. (i). Conflict resolution is necessary as there will be occasions when more than one rule will have all conditions matching the facts in working memory .

(ii). The RETE algorithm exists to decide which rules should exist in a given conflict set at any stage during the consultation process with an expert system.

(iii). Specificity fires the rule in the conflict set which has most conditions attached to it.

26. a. If colour is dark then  
soil is acidic.

If colour is brown then  
soil is loamy.

If colour is light then  
soil is clay.

b. Usually and often.

c. If soil is acidic then  
the soil is suitable for growing azaleas  
CF 90%.

If soil is loamy then  
the soil is suitable for growing azaleas  
CF 75%.

## **IS H Exam 2006 - Section III**

27. a. 3, 4 and 6.

b. (i). Rule 3.

(ii). Rule 6.

## IS H Exam 2007 - Section I

1. All details of a customer or a hotel may be completely removed from the database, if the record deleted is the only one with the customer or hotel's details stored.
2. a. If the digits are not included then the number may not be **unique** as there could easily be someone with the same name, date of birth and initials.  
b. If someone changes their name, if they got married for example, then their driving licence number would have to be changed, which could affect a lot of related records.
3. A foreign key is an attribute that exists in an entity and is a primary key value in a related entity.
4. Referential integrity is ensuring that no foreign key value can exist unless there is a corresponding existing value in the related table.
5. a. Item. Each transaction is likely to involve shoppers buying a variety of different goods.  
b. The domain is the range of acceptable values for an attribute.  
c. The operator attribute might well be a restricted choice.
6. Knowledge is awareness gained by experience of a fact or information.

## IS H Exam 2007 - Section I

7. Hospitals use expert systems to provide a second opinion regarding illnesses that doctors do not have a lot of experience with or are hard to diagnose.
8. a. It is quantitative in that numerative values can be extracted from the chart. e.g. 20% of people surveyed think that food is excellent.  
It is qualitative in that deciding whether food is excellent or good is a matter of people's opinion.  
b. If the sample does not include enough people, then the reliability of the results may be questionable.
9. An EIS allows **drill downs** to tactical and operational levels to support decisions made.
10. Support available and functionality are 2 criteria to evaluate software.
11. They should ensure that employees have a right to eye tests for using screens. They should also try to organise work to allow breaks for users working with display screens.
12. The RIP Act provides government agencies with powers regarding the interception of communications, such as carrying out surveillance.

## IS H Exam 2007 - Section II

13. a.

**INF**

member	( <u>member no</u> member name member address member telephone trainer ID trainer name trainer address trainer telephone)	session	( <u>date</u> <u>exercise ID</u> equipment duration level performance score <u>member no</u> )*
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Table to aid in finding key

date	Ex. ID	Equipment	Duration	Level	Score	Member
26/06/07	EB21	Bike	10	5	13	97842
26/06/07	ST04	Stepper	15	4	15	97842
26/06/07	EB21	Bike	10	5	16	41845

ii. Member key: member no

Session key: Compound key of date, exercise ID and member no.

Foreign key: member no.

## IS H Exam 2007 - Section II

13. b.

**For 2NF**

member	( <u>member no</u> member name member address member telephone trainer ID trainer name trainer address trainer telephone)	session	( <u>date</u> <u>exercise ID</u> equipment duration level performance score <u>member no</u> *)
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Table to aid in identifying partial dependencies

date	Ex. ID	Equipment	Duration	Level	Score	Member
26/06/07	EB21	Bike	10	5	13	97842
?	EB21	Bike	10	5	?	?
?	EB21	Bike	10	5	?	?

## IS H Exam 2007 - Section II

13. b.

**2NF**

member (member no  
member name  
member address  
member telephone  
trainer ID  
trainer name  
trainer address  
trainer telephone)

session (date  
exercise ID\*  
performance score  
member no\*)

exercise (exercise ID  
equipment  
duration  
level)

ii. Member key: member no

Session key: Compound key of date, exercise ID and member no.

Foreign key: member no. and exercise ID

Exercise key: exercise ID

## IS H Exam 2007 - Section II

13. c.

**For 3NF**

member (member no  
member name  
member address  
member telephone  
trainer ID  
trainer name  
trainer address  
trainer telephone)

session (date  
exercise ID\*  
performance score  
member no\*)

exercise (exercise ID  
equipment  
duration  
level)

Table to identify non-key dependancies

Member no	name	address	phone	trainer ID	name	address	phone
61524	Joe Smith	7 Scott St	6254873	7	Dean Andrews	5 Park Lane	764523
?	?	?	?	7	Dean Andrews	5 Park Lane	764523
?	?	?	?	5	?	?	?

## IS H Exam 2007 - Section II

13. c.

**3NF**

member ( <u>member no</u> member name member address member telephone trainer ID)*	session ( <u>date</u> <u>exercise ID*</u> performance score <u>member no*</u> )
--	--

exercise ( <u>exercise ID</u> equipment duration level)	trainer ( <u>trainer ID</u> trainer name trainer address trainer telephone)
--	--

ii. Member key: member no, Foreign key: trainer ID

Session key: Compound key of date, exercise ID and member no.

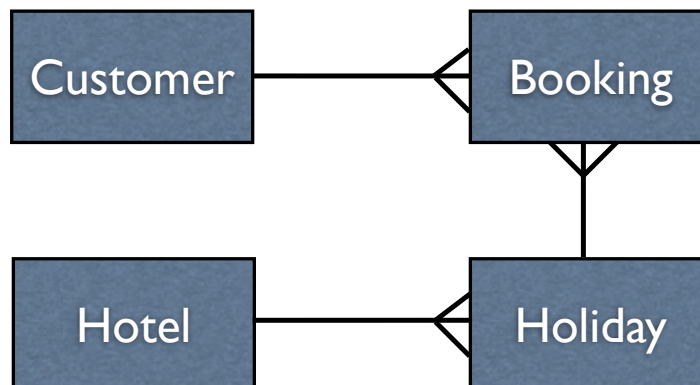
Foreign key: member no. and exercise ID

Exercise key: exercise ID

Trainer key: trainer ID

## IS H Exam 2007 - Section II

14. a.



b. A - Text(11)

B - Integer

C - Boolean

D - Restricted choice from 3, 7, 10, 14, 21

E - > 0

F - Lookup value from Hotel entity

G - FK

## IS H Exam 2007 - Section II

15. a. 4 potential problems could involve:

Compatibility - Will the new software run on the department's current hardware (which is not being changed)? Perhaps their operating system is not suitable to handle the demands of the new software.

Compatibility - data will have to be shared with other departments who are not making the new purchase. Will their existing software be able to open up files created in the new software.

Support - Will the staff be able to keep up their levels of productivity with the new software? Perhaps a great deal of training will be required which the department cannot budget for.

Functionality - Will the software contain the specific functions that are routinely used within the department?

b. (i). Software strategy and upgrade strategies will have to be considered.

## IS H Exam 2007 - Section II

16. a.  $C15 = \text{COUNT}(C4:C13)$

b.  $D4 = \text{IF}(C4 \geq 70, "A", \text{IF}(C4 \geq 60, "B", \text{IF}(C4 \geq 50, "C", "F")))$

c. (i). Lookup

(ii). C4

(iii). G2...H8

17. a. They would do this to ensure that employees are using resources specifically for work purposes and not other things, such as booking holidays on the company's time. They would also do it to ensure there is no access to illegal content.

b. Log files can be used to track activity.

c. Organisations have a legal right to monitor such information, although employees should have signed an acceptable use policy outlining how and why the network is monitored.

Ethically employees may feel that their rights to privacy are being breached. The company may argue that they are doing it for the good of the company in that they will be perceived as an organisation who do all they can to stamp out illegal activities being carried out by their employees.

d. No, as this act pertains only to public authorities and not private companies.

## IS H Exam 2007 - Section III

22. a. (i). CF conclusion = CF rule x Min (CF condition)

$$CF = 90\% \times \text{Min} (60\%, 80\%, 40\%)$$

$$CF = 90 \times 40$$

$$CF = 36\%$$

ii. CF (attach with sword) =  $80\% \times \text{Min} (60\%, 80\%, 40\%)$

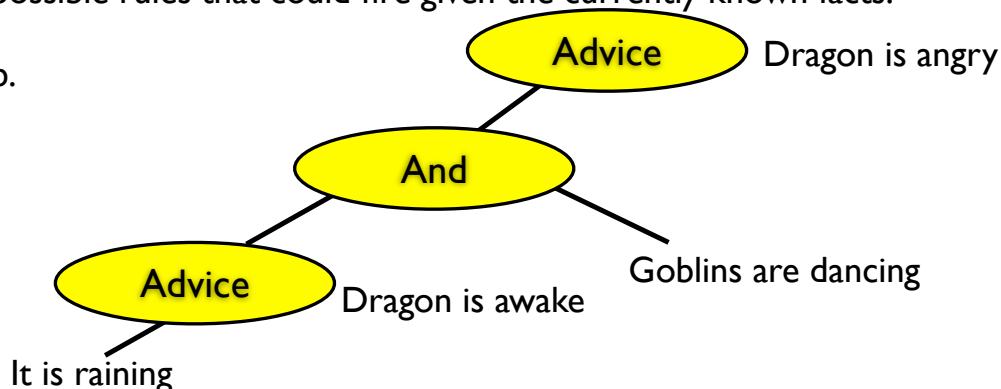
$$= 80\% \times 40\% = 32\%$$

CF (attach with lance) =  $70\% \times \text{Min} (60\%, 80\%)$

$$= 70\% \times 60\% = 42\%$$

Advice would be attack with lance because this provides the highest certainty of all the possible rules that could fire given the currently known facts.

b.



## IS H Exam 2007 - Section III

22. c. (i). The working memory contains all the facts that are known to be true during the consultation of an expert system.

(ii). A conflict set is the group of rules which could be fired at any point during a consultation. For a rule to be able to fire all of the conditions attached would have to be true, i.e. represented of facts in working memory.

(iii). The RETE algorithm is used to comb the knowledge base and the working memory to provide the list of rules that could fire.

(iv). The specificity strategy works by firing the rule with the most conditions attached.

23. a.

No. of colours	Stitch	Pattern type
one	one	simple
many	one	complex
one	many	complex
many	many	complex

## IS H Exam 2007 - Section III

23. c. If pattern is simple  
then member can knit garment.

If garment is scarf  
and pattern is complex  
and grading is  $> 1$   
then member can knit garment.

If grading is  $= 3$   
then member can knit garment.

c. (i).  $\text{grade}(\text{ailsa}, \text{grade\_3}) \wedge \text{has knitted}(\text{ailsa}, \text{jumper}, \text{complex})$

(ii).  $\forall(x): \text{has knitted}(x, \text{socks}, \text{simple}) \rightarrow \text{grade}(x, \text{grade\_2})$

## IS H Exam 2007 - Section III

24. Category: Classification

Domain: Molecular chemistry

Main Characteristics: Used forward chaining.

Earliest expert system - taking over 20 man years to develop.

25. a. The database would have an in-built table of all postcodes and relevant addresses. A query would be run using the current value in the start postcode field and it would return the given address.

b. Route planning is a suitable domain to create an expert system on as there are a wealth of sources to gather the required information from such as ordnance survey maps etc.

Because roads are generally unlikely to change too much, there will not be a need for constant updating of the knowledge base making the system more likely to be up to date without the need for constant changes which could make the system unworkable.

c. (i). One system may simply have incorrect information on a particular route.

One system may be more up to date than another, e.g. one may have details of a new by-pass missing from the other.

Alison may have entered incorrect information into the user interface on one of the systems.

## **IS H Exam 2007 - Section III**

25. c. (ii). The system cannot take account of unexpected traffic accidents or very poor weather that could occur.

The system will assume a constant speed between the two routes and individual drivers are likely to travel at very different speeds and so will find that times are different than that shown in the system.

## IS H Exam 2008 - Section I



1. a. Item number.

Each value is unique and non-specific, and will not have to be changed in the future.

b. If deleting item number 12123 because this canvas is no longer stocked, say, then all details of the supplier, Fabricceze, such as address and phone number will also be lost from the database, as no other record contains this information.

2. A Boolean data type is one which only has two states and therefore values, such as a field containing a yes/no, on/off option.

3. Referential integrity means that no instance of a foreign key value should be allowed to exist, unless there is a corresponding value as a primary key in the related table.

4. a. Many: Many (M:N)

b. One: Many (1:M)

5. In 1NF, there will be no repeating data, and data represented in a table would have a single value for each row in the table.

6. A surrogate key would be used as a replacement for a complex compound key containing several attributes, or for a table where there is no obvious primary key at all.

## IS H Exam 2008 - Section I

7. Metadata is data about data, e.g. a data dictionary gives information about the fields that will be included in a database table.

8. a. Source - primary

b. Form - Aural

9. A decision support system is used to aid managers in making decisions by considering the relevant information contained in the DSS, often in a summarised format.

10. Two areas covered are video and sound.

11. Ahmed could use a help desk or consult an online forum/user group.

12. Companies use data mining by looking at customer orders for patterns to then target the customer with appropriate advertising suggestions.

## IS H Exam 2008 - Section II

13. a. **UNF** pupil (pupil ID  
 courses pupil name  
 form class  
 form teacher  
 room  
 telephone  
 course code  
 subject  
 level  
 grade) } repeating data

Sample data table to identify repeating data

pupil ID	pupil name	form class	form teacher	room	telephone	course code	subject	level	grade
12132	Tom Jones	5C	Mr Lee	A22	143	5MAA1 FRC12 5EN12 SR11	Maths French English RE	Higher Int 2 Higher School-based	C A B Ungraded
15634	Chris Smith	1A	Ms Simpson	G13	132	FRC12 5EN11 5MAA1	French English Maths	Int 2 Higher Higher	B C C C

## IS H Exam 2008 - Section II

13. a. **INF**

pupil (pupil ID  
 pupil name  
 form class  
 form teacher  
 room  
 telephone)  
 Course (course code  
 subject  
 level  
 grade  
pupil ID)\*

Sample data table to aid in finding key

course code	subject	level	grade	Pupil ID
5MAA1	Maths	Higher	C	12132
5EN12	English	Higher	B	12132
FRC12	French	Int 2	A	12132
FRC12	French	Int 2	B	15634
5EN11	English	Higher	C	15634
5MAA1	Maths	Higher	C	15634

## IS H Exam 2008 - Section II

### 13. a. For 2NF

pupil (pupil ID  
pupil name  
form class  
form teacher  
room  
telephone)

Course (course code  
subject  
level  
grade  
pupil ID\*)

Sample data table to aid in finding partial dependencies

course code	subject	level	grade	Pupil ID
5MAA1	Maths	Higher	C	12132
5EN12	English	Higher	B	12132
5MAA1	Maths	Higher	?	?

Knowing only the course code, we can find out the subject and level.

## IS H Exam 2008 - Section II

### 13. a. 2NF

pupil (pupil ID  
pupil name  
form class  
form teacher  
room  
telephone)

Award (course code\*  
grade  
pupil ID\*)

Course(course code  
subject  
level)

## IS H Exam 2008 - Section II

### 13. a. For 3NF

pupil (pupil ID  
pupil name  
form class  
form teacher  
room  
telephone)

Award (course code\*  
grade  
pupil ID\*)

Course(course code  
subject  
level)

Sample data table to aid in finding non-key dependencies

pupil ID	pupil name	form class	form teacher	room	telephone
12123	Tom Jones	5C	Mr Lee	A22	143
15634	Chris Smith	1A	Ms Simpson	G13	132
16783	Ann James	5C	Mr Lee	A22	143

Knowing the form class gives all form details

## IS H Exam 2008 - Section II

### 13. a. For 3NF

pupil (pupil ID  
pupil name  
form class)\*

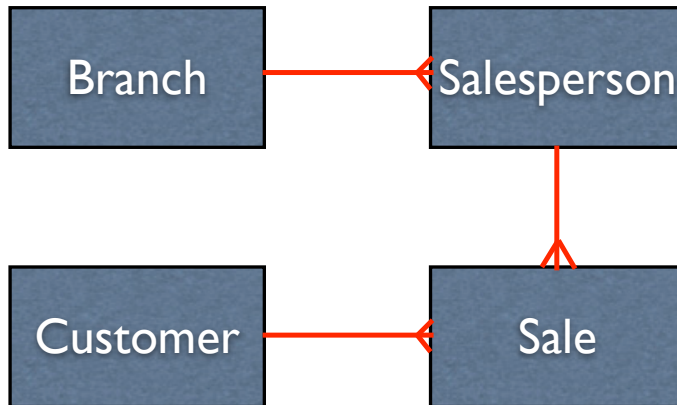
Award (course code\*  
grade  
pupil ID\*)

Course(course code  
subject  
level)

Form (form class  
form teacher  
room  
telephone)

## IS H Exam 2008 - Section II

14. a

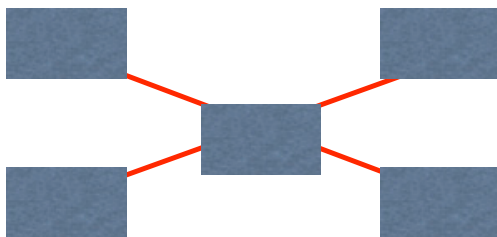


14. b. (i). Tables (and fields) - Sale (Date, amount), Customer (Customer name), Salesperson (Sales ID)

(ii). The RDBMS would have to have the facility to create summary functions and also to display a sub-summary of information (in this case total amount on the bill, appearing only once for the records it summarises).

## IS H Exam 2008 - Section II

15. a. (i). A suitable topology would be a star topology.



(ii). A stylesheet could be used to ensure that everyone uses the same standard font and font size, as well as having consistent margins.

(iii). The text wrap feature has been used.

b. The font types are Serif (Century and Times) and Sans-Serif (Arial and Tahoma).

c. (i). A header makes the same information automatically appear at the top of every page (or section) in a document.

(ii). Pagination could be used to insert page numbers and page breaks in a document.

## IS H Exam 2008 - Section II

16. a. The Internet has meant that there are less personal experiences between customers and shops, which can affect strong relationships and encourage loyalty in customers, as people are more likely to shop where they are made to feel known and welcome.

It has also meant that shops cannot give customers the expert knowledge on products to the extent as before without the opportunity for face to face communications and questioning staff on the merits or otherwise of various products.

b. Censorship laws vary from country to country. When a Government blocks a site that is not blocked by other Governments then who is to say what the correct course of action is?

Throughout the world, people have fought vociferously for Freedom of Speech. The Internet provides great scope for Freedom of Speech but this is hindered when a Government takes such an action.

## IS H Exam 2008 - Section II

17. a. Lachlan should be prepared to talk about policies and procedures for applying password strategies within the organisation.

He should consider how and who is responsible for applying access rights within the organisation.

He will also discuss how the company will deal with unauthorised access to the company's information from outwith the organisation, specifically mentioning firewalls and how they are established and maintained.

Lachlan will also consider how encryption techniques should be used with organisational data sent via the Internet and stored on memory sticks and CDs etc.

Consideration will have to be given to how the company deals with the threats of viruses and Lachlan will talk about anti-virus software and procedures.

b. The company should look to store the backups using a system of magnetic tapes, which can easily be held off-site as required.

Grandfather-Father-Son could be used with a set of daily tapes marked Monday to Thursday (the Son tapes) and a weekly backup taken on a Friday (the Father tapes - 4 to be held for each week in a month). At the end of a 4 weekly cycle, a monthly backup should take place (the Grandfather tapes, using 12 for each month in the year).

The Grandfather files will certainly be stored offsite in the event of a disaster such as fire happening.

## IS H Exam 2008 - Section III

21. a. The system could be used to provide a second opinion for mechanics on rare engine problems or for some of the newer qualified mechanics who may not be as experienced as their colleagues.

The expert system may allow the pinpointing of faults quickly for customers without the need to have the car inspected by mechanics, who would be able to continue with the job of fixing car faults.

b. Such a system could mean that mechanics lose their jobs, or an over-reliance on such a system may mean that they are not as familiar with some aspects of car fault-finding as they would be otherwise.

c. (i). Knowledge acquisition

Knowledge representation

(ii). The expert who provided the advice may have given wrong information at the knowledge acquisition stage.

A knowledge engineer could have incorrectly coded the information provided by the user at the knowledge representation stage.

## IS H Exam 2008 - Section III

22. a. Information in an MIS is extracted via queries and reports. This information is then used by management to make informed decisions.

In an expert system, a consultation of the system is undertaken and the advice provided is meant to be taken as the actual decision.

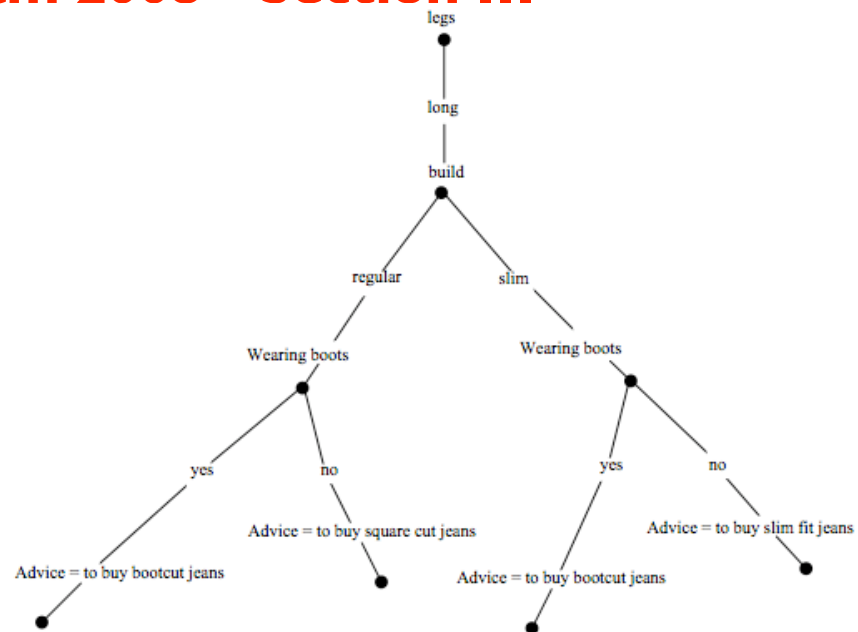
Essentially, with an expert system the software makes the decision, whilst with an MIS people make the decision, with the software (and information) acting as an aid.

b. In an expert system, data is represented as knowledge and facts stored as production rules in the knowledge base.

With a relational database, data is stored using fields, records and a series of related tables established via the matches between primary and foreign keys.

## IS H Exam 2008 - Section III

23. a.



b. The graphical nature of the decision tree can make it easier to pinpoint errors that occur in representing information.

c. If legs are short  
AND build is regular  
AND wearing boots is no  
THEN advice is to buy loose fit jeans

If legs are short  
AND build is slim  
AND wearing boots is no  
THEN advice is to buy loose fit jeans

## IS H Exam 2008 - Section III

24. a. (i). 1, 2 and 3.

(ii). Rule 3.

(iii). Conflict resolution strategies are required because at any point during a consultation in a forward chaining system there may be several rules which could fire, i.e. all the conditions attached to the rule are known to be true.

b.  $G \wedge \neg L \rightarrow N$

## IS H Exam 2008 - Section III

25. a. (i). CF conclusion = CF rule x Min (CF condition)

$$\text{CF} = 70\% \times \text{Min} (50\%, 80\%)$$

$$\text{CF} = 70 \times 50$$

$$\text{CF} = 35\%$$

CF (damaged Achilles) :  $90\% \times \text{Min} (80\%, 50\%)$

$$90\% \times 50\% = 45\%$$

CF (heel spur) :  $70\% \times \text{Min} (80\%, 80\%)$

$$70\% \times 80\% = 56\%$$

Advice is patient has heel spur, because this is the conclusion with the greatest certainty.

b. A certainty factor of 90% would be appropriate due to the use of the term “very likely”.