21. a. CF conclusion = CF rule x Min (CF condition)
CF = 80% x Min (70%, 50%)
CF = 80 x 50
CF = 40%

b. CF (Steenhive Course) : 70% x Min (70%, 90%)
70% x 70% = 49%

CF (Inverwick Course) : 80% x Min (80%, 80%, 90%)
80% x 80% = 64%

Advice is play Inverwick Course, because it has a higher certainty factor than any other rules that could currently fire.

c. Course to play IS Inverwick Course
IF round preference IS parkland
AND recommended maximum handicap IS 24
AND cost of round IS < £40.

Information Systems Prelim 0910 Section 3

22. The expert system is queried by running a consultation of the system, resulting in the user having to answer a series of questions in the user interface, until such time that the answers provided allow the system to display advice to the user in the same user interface, with the potential for justification of this advice..
In a relational database, a query is created allowing the user to enter search criteria in their chosen fields to immediately produce a sub-set of records (possibly in a report format) which match the search criteria.

23. (i). lives_in(alan, hightown, cycles) $\wedge$ pupil_in(alan, brewerly_academy)

(ii).$\forall$ (x): lives_in(x, deeville, walks) $\longrightarrow$ pupil_in(x, brewerly-academy)

24. a. 1, 3

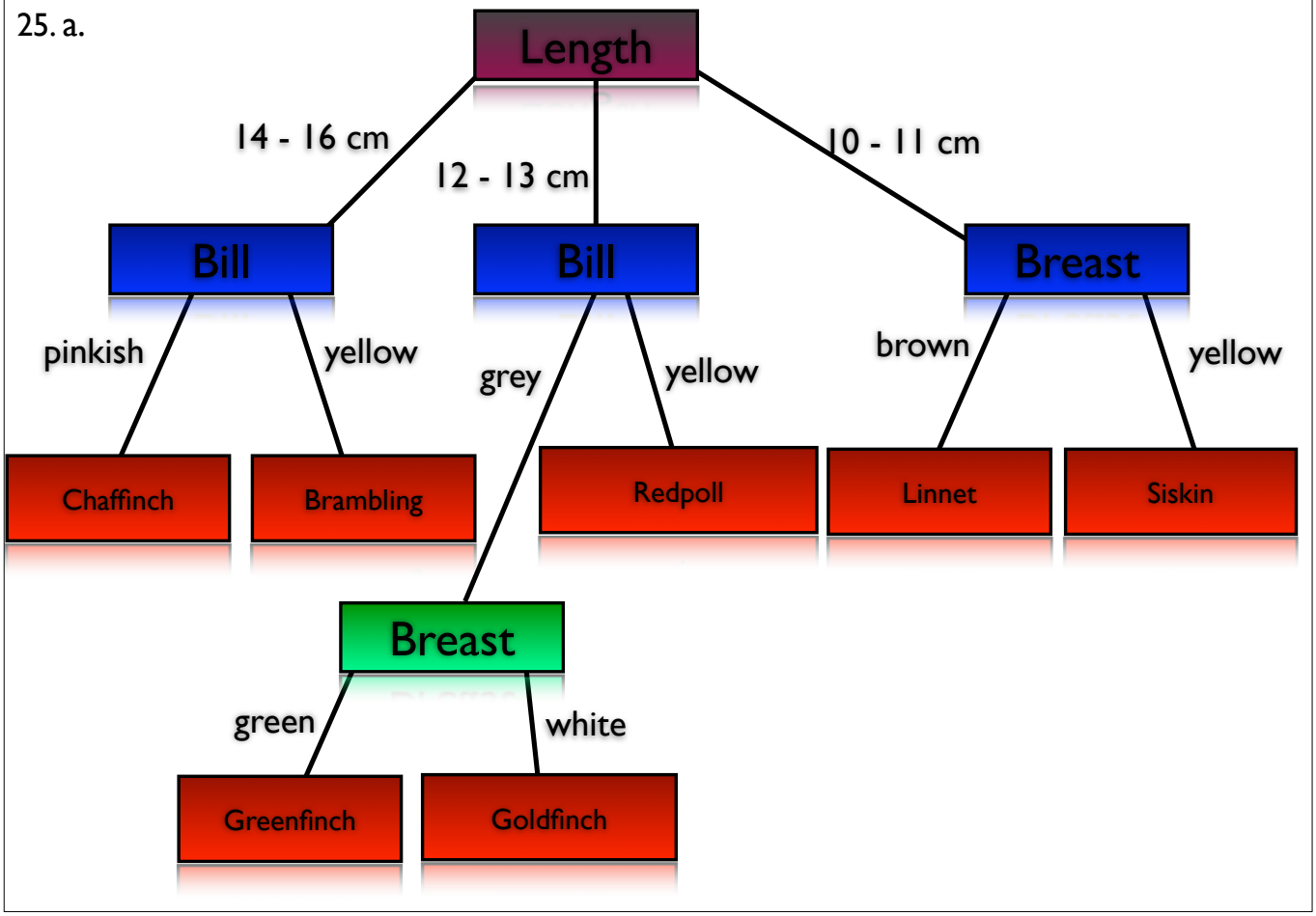
(ii). 3

(iii). Refractoriness removes any rules which have already fired from the conflict set so that it does not result in the system looping infinitely.

b. The RETE algorithm alleviates the burden from the inference engine by deciding the order in which rules are fired in working memory at each stage of a consultation.

c. B $\wedge \neg$ G $\longrightarrow$ K

25. a.



Information Systems Prelim 0910 Section 3

25. b. IF length 14 - 16 cm AND
bill colour IS yellow
THEN finch IS Brambling

IF length 14 - 16 cm AND
bill colour IS brown
THEN finch IS Chafffinch

IF length 10 - 11 cm AND
breast colour IS brown
THEN finch IS Linnett

26. a. (i). The knowledge in an expert system in not lost, as can be the case when a human expert dies, say.
An expert system can also be composed of the expert knowledge of a series of domain specialists, instead of just one.

(ii). An expert system can only provide advice for as much facts and rules as are built into the knowledge base.
Expert systems have high maintenance and creation costs, and may not be affordable for an organisation.

26. b. (i). ONCOCIN - Domain - Medical (Cancer Treatment). Category - Planning

(ii). The domain expert is the person who provides the specialist knowledge to be provided in the system.
The knowledge engineer is the person who is responsible for taking the information from the expert and putting it into a format more appropriate (such as a factor table) such that it can then be entered into a knowledge representation language (KRL).

e. A user may have incorrectly answered a question in the user interface, e.g. accidentally choosing yes to a question where they should have chosen no.
The system may have been programmed incorrectly by the programmer.