Chapter 22: Artificial Intelligence (AI): Answers to Worksheet questions

Worksheet 22.1: for testing basic understanding

1 No matter how many times the same question is asked of the expert system, the same recommendation or diagnosis will be presented and the performance will remain unchanged. If improved performance were needed then more facts would have to be entered into the knowledge base. Machine learning, on the other hand, is when the system adjusts its output depending on the previous level of success. The system can improve its performance using the same databank. This requires the system to adjust the inferences it is drawing with regard to the relationships it perceives in the databank.

2 A False, B True, C True, D True, E False, F True

Note that although a neural network can be represented by what looks like a graph, it cannot be called a graph because it does not have labelled nodes and edges.

3 **a** All three are examples of approaches to machine learning. In each case, the system adjusts its behaviour depending on the success of its previous performance.

b In supervised learning there are some sample outcomes that are made available that have resulted from some identified input data. The system takes in this data and produces what it considers to be the best outcomes. These are compared with the recorded outcomes. As a result of the comparison the system tries again to see if it can improve on the match with the sample outcomes.

In unsupervised learning the system has to make its own assessment of the success in providing the optimum outcomes. Otherwise it follows the same process of adjusting its assumptions about how the outcomes should be predicted in an attempt to be more successful.

Reinforcement learning is a type of supervised learning that involves reward feedback being provided to the system when it makes a sensible step towards the ideal outcome.

c Unsupervised learning requires a large databank which contains factual data that can be used to assess the success of past performance and to guide the attempts at improved performance.