



Shrewsbury School

SHREWSBURY SCHOOL

SIXTH FORM ENTRANCE EXAMINATION 2016

COMPUTER SCIENCE

(1 Hour)

Instructions to candidates:

Attempt all 5 questions in Section A and then 2 out of 3 questions in Section B.

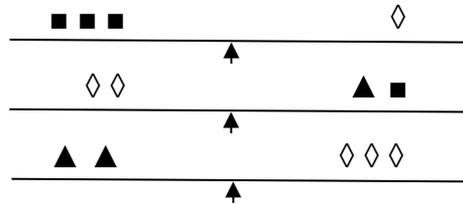
Answer on separate sheets of paper, showing all workings out.

SECTION A

Structured short-answer, problem-solving questions. Answer on separate sheets of paper, showing all working out. Cross out work that you do not want to be marked.

Attempt all 5 questions.

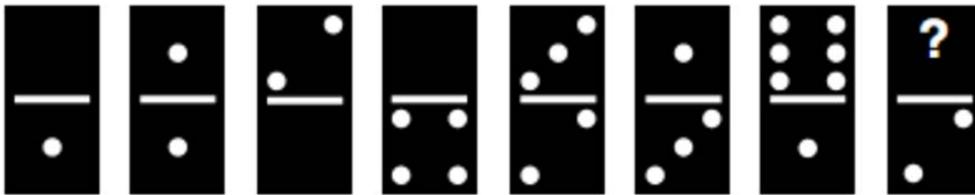
1. The first 2 scales are balanced. What symbol is missing from the 3rd scale to make it balance?



Explain your answer.

[4]

2. How many dots should be at the question mark, in the sequence...



Hint: think in pairs. Explain your answer.

[3]

3. You have 2 jugs of water and a tap to refill the jugs. One jug holds 5 litres and one jug holds 8 litres.

a) How do you get 3 litres of water?

[1]

b) How do you get 1 litre of water?

[4]

4. You are given a bunch of sticks of different lengths. Two sticks can be combined into a single, larger stick by a process that costs the sum of the lengths of the two sticks. For example, suppose you initially have three sticks of lengths 1, 2, and 4. You could combine sticks 2 and 4 at a cost of 6, then combine that stick with stick 1 at a cost of 7, for a total cost of 13.

a) Find the least expensive way of combining those sticks, lengths 1, 2 and 4

[2]

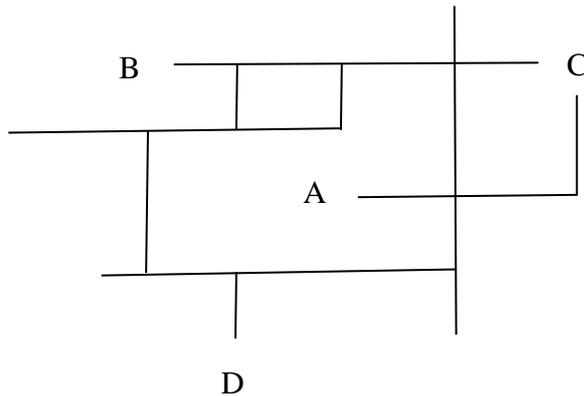
b) Find the least expensive way of combining five sticks of lengths 1, 9, 6, 2, 5

[4]

5. A robot delivers packages between 4 locations, A, B, C and D, following the road map below. When the robot gets to a junction it must turn left (L) or right (R). It cannot go straight on. A 90-degree bend on its own is not a junction. For example, the route from D to A is given by the instructions RLL.

journey length = the number of instructions, in this case 3.

Assume the robot is always facing away from the starting point before each journey.



- What are the instructions for the route from A to D? [1]
- What is the journey length? [1]
- Which is the shortest journey? [2]
- Do any routes between two locations have alternative routes? Explain. [3]
- Are the return journeys always the same length? Explain. [3]
- What would be achieved if the robot were allowed a straight on (S) choice at junctions? [3]

SECTION B

Extended writing section

Choose 2 out of the 3 possible topics. You are expected to write about one side for each. You can write in sentences, or a list might be more appropriate for some questions.

1. Cloud storage is where users upload files to a data centre which is managed and maintained by a cloud storage company. Examples of cloud storage are OneDrive, Google Drive or Dropbox.
Discuss the advantages and disadvantages for a 15-year-old school pupil of using cloud storage to store their school work files. Conclude by advising whether or not you would recommend cloud storage.
2. Sally, a first year university student, is studying Mechanical Engineering. She is very well informed about technology and will buy a computer to start the new year. What kind of factors should she consider apart from price? Credit will be given for explaining technical specifications in your answer.
3. Software applications and websites are written by programmers using programming languages, for example Python, C# and Javascript. From your own experience or otherwise explain what a programming language is. What kind of features and characteristics do they have? Why are there so many different types?

[10 marks each]

[Total marks 51]