

## AS COMPUTING

Unit 1      Problem Solving, Programming, Data Representation and  
Practical Exercise

June 2016

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## Preliminary Material

To be issued to candidates on or after **Tuesday 1 March 2016**, subject to the instructions given in the Teachers' Notes (COMP1/TN).

### Information

- The Preliminary Material is to be seen by candidates and their teachers **only**, for use during preparation for examination on Monday 6 June 2016. It **cannot** be used by anyone else for any other purpose, other than as stated in the instructions issued, until after the examination date has passed. It must **not** be provided to third parties.
- A Skeleton Program is provided separately by your teacher and must be read in conjunction with this Preliminary Material.
- Candidates are advised to familiarise themselves with the Preliminary Material and Skeleton Program before the examination.
- Another copy of this Preliminary Material will be made available to you in the examination. You will also be given access to the Skeleton Program electronically at the start of the examination. You must **not** take any copy of the Preliminary Material, Skeleton Program or any other material into the examination room.

## INSTRUCTIONS FOR CANDIDATES

The question paper is divided into four sections and a recommendation is given to candidates as to how long to spend on each section. Below are the recommended timings for the 2016 examination.

### SECTION A

You are advised to spend no more than **35 minutes** on this section.

Questions will examine the specification content **not** specific to the **Preliminary Material**.

### SECTION B

You are advised to spend no more than **15 minutes** on this section.

You will be asked to create a new program **not** related to the **Preliminary Material** or **Skeleton Program**.

### SECTION C

You are advised to spend no more than **15 minutes** on this section.

Questions will refer to the **Preliminary Material** and the **Skeleton Program**, but will not require programming.

### SECTION D

You are advised to spend no more than **55 minutes** on this section.

Questions will use the **Skeleton Program** and the **Preliminary Material**.

### Electronic Answer Document

Answers for all questions for all sections must be entered into the word processed document made available to the candidate at the start of the examination and referred to in the question paper rubrics as the **Electronic Answer Document**.

### Preparation for the Examination

For your programming language you should ensure that you are familiar with this **Preliminary Material** and the **Skeleton Program**.

## AQA REVERSE

The **Skeleton Program** accompanying this Preliminary Material is for the board game AQA REVERSE.

AQA REVERSE is a board game in which a human plays against the computer. Each player takes it in turn to make a move by specifying coordinates of where they would like to place one of their pieces – the human player uses pieces labelled "H" and the computer uses pieces labelled "C". A piece can only be put in an empty square on the board.

After a player has put a piece on the board any of the opponent's pieces that are now trapped, either horizontally or vertically, between the piece just placed and one of the player's other pieces are flipped – this means that they now change their label (if they were an "H" they become a "C" and vice versa). There must be no empty spaces or other pieces belonging to the player between the two trapping pieces.

The game finishes when every square on the board contains a piece. The winner is the player who has the most pieces on the board at the end of the game. The human player always moves first.

**Figure 1** shows the initial board. The default board consists of a 6x6 grid of squares.

**Figure 1**

1						
2						
3			H	C		
4			C	H		
5						
6						
	1	2	3	4	5	6

When the **Skeleton Program** is run, a menu is displayed giving the user four options to choose from: they can enter **p** to play the game, **e** to enter their name, **c** to change the size of the board or **q** to quit the program.

To enter a move the human player types in the reference of the square where they want to place a piece (see **Figure 1**). If the move entered is a valid move then the board will be updated and it will now be the computer's turn.

Turn over ►

**Figure 2, Figure 3, Figure 4, Figure 5 and Figure 6** show an example of the first four moves of a game.

**Figure 2**

An 8x8 board size has been chosen. The initial board is displayed.

1								
2								
3								
4				H	C			
5				C	H			
6								
7								
8								
	1	2	3	4	5	6	7	8

**Figure 3**

The human player puts a piece in square 64 (column six, row four).

1								
2								
3								
4				H	H	H		
5				C	H			
6								
7								
8								
	1	2	3	4	5	6	7	8

The computer piece in square 54 was flipped as it was trapped between two of the human player's pieces.

**Figure 4**

The computer player puts a piece in square 43.

1								
2								
3				C				
4				C	H	H		
5				C	H			
6								
7								
8								
	1	2	3	4	5	6	7	8

The human player's piece in square 44 was trapped between two of the computer's pieces so it was flipped.

**Figure 5**

The human player puts a piece in square 24.

1								
2								
3				C				
4		H		C	H	H		
5				C	H			
6								
7								
8								
	1	2	3	4	5	6	7	8

The computer player's piece in square 44 is **not** trapped between the human player's pieces on squares 24 and 54 as there is an empty square at 34.

Turn over ►

**Figure 6**

The computer player puts a piece in square 74.

1								
2								
3				C				
4		H		C	C	C	C	
5				C	H			
6								
7								
8								
	1	2	3	4	5	6	7	8

The human player's pieces in squares 54 and 64 were trapped between the computer player's pieces on squares 44 and 74 so they were flipped.

**Notes**

Your chosen programming language may use arrays with a lower bound value of 0. If so, array cells with indices of 0 are not used.

**END OF PRELIMINARY MATERIAL**

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