1. A group of A-level students are working together to program a computer game.

In the game, the player controls a character who moves through a virtual world. The game starts with a load-up screen. The player can select which area to move to on an on-screen map, and then they control the movements of their character using a keyboard to solve puzzles on the screen.

The game is to be created using sub-procedures. The following table identifies and describes one sub-procedure the students could use.

Complete the table below, identifying **three** additional sub-procedures that the students could create from the description at the start of question **2**.

Describe the purpose of each sub-procedure you have identified.

	Sub-procedure	Purpose
e.g.	`characterMovement`	*Takes the key the player pressed and moves the character in that direction*
1		
2		
3		

[6]

2. A software developer is creating a Virtual Pet game.

The user can choose the type of animal they would like as their pet, give it a name and then they are responsible for caring for that animal. The user will need to feed, play with, and educate their pet.

The aim is to keep the animal alive and happy, for example if the animal is not fed over a set period of time then the pet will die.

- The game tells the user how hungry or bored the animal is as a percentage (%) and the animal's intelligence is ranked as a number between 0 and 150 (inclusive).
- Hunger and boredom increase by 1% with every tick of a timer.
- When the feed option is selected, hunger is reduced to 0.
- When the play option is selected, bored is reduced to 0.
- When the read option is selected, the intelligence is increased by 0.6% of its current value.

An example of the game is shown:

```
What type of pet would you like? Fox or Elephant?
Fox
What would you like to name your Fox?
Joanne
Joanne's stats are
Hunger: 56%
Bored: 85%
Intelligence: 20
What would you like to do with your pet? Play, Read or Feed?
```

Fig. 1.1

The developer is using decomposition to design the game.

(i) Describe the process of decomposition.

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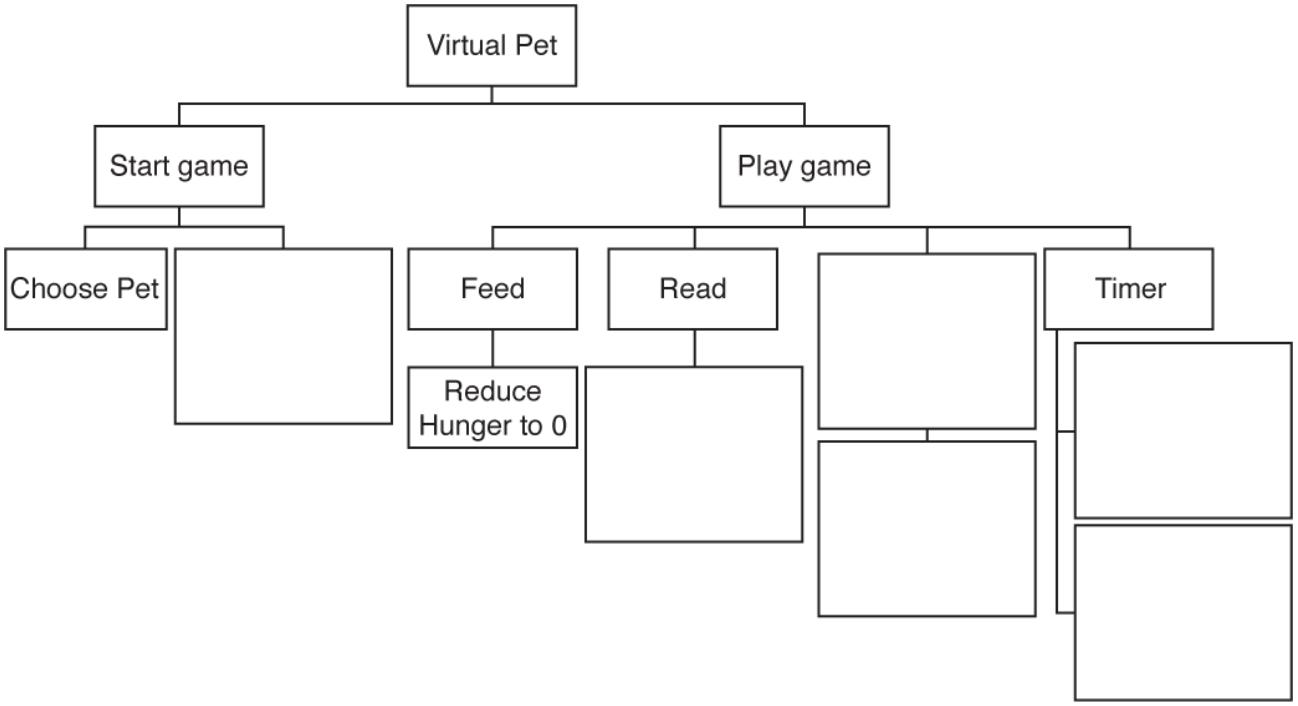
[2]

(ii) The developer has produced the following structure diagram for the game:

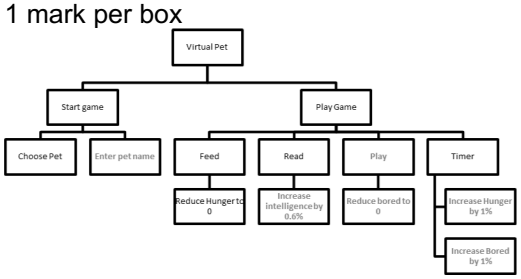


Complete the structure diagram for the Virtual Pet game by filling in the empty boxes.

[6]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1			1 mark for sub-procedure names (to max 3) 1 for description (to max 3) e.g. • `startGame` [1] • loads the game, displaying the load-up screen[1] • `displayMap` [1] • outputs the map onto the screen[1] • `selectArea` [1] • the user clicks on the area of the map and this is displayed on screen[1] • `loadPuzzle` [1] • loads the puzzle for the chosen area and displays it on screen [1]	6 AO2.2 (6)	Allow any reasonable sub-procedure and description for the context Do not award marks for character movement. **Examiner's Comment:** Most candidates scored well, but some repeated items from the stem of the question and gave answers related to character movement which were not creditworthy.
			Total	6	
2		i	1 mark per bullet to max 2 • Splitting a problem down • Into its component parts/sub-procedures/modules	2 AO1.1 (2)	**Examiner's Comment:** Nearly all candidates scored full marks for factual recall of the required definition.

Question			Answer/Indicative content	Marks	Guidance
		ii	1 mark per box 	6 AO2.2 (6)	Calculations must be correct **Examiner's Comment:** Nearly all candidates achieved three or more marks after analysing the requirements in the stem of the question. A number gave incorrect multiplying factors for some of the required elements and thus lost marks where mathematical accuracy was required.
			Total	8	