"3-a-day" A-Level Exam Practice Unit 2 (004)

Question 1

A car racing team uses a car simulator to test their drivers in a range of cars on different race tracks.

Identify **three** inputs that will be required to configure the initial conditions for running the simulation.

1 ....

2 ....

3 .... **[3]**

Question 2

6 A salesman travels around the country, stopping at specific places, and then returning to the starting place.

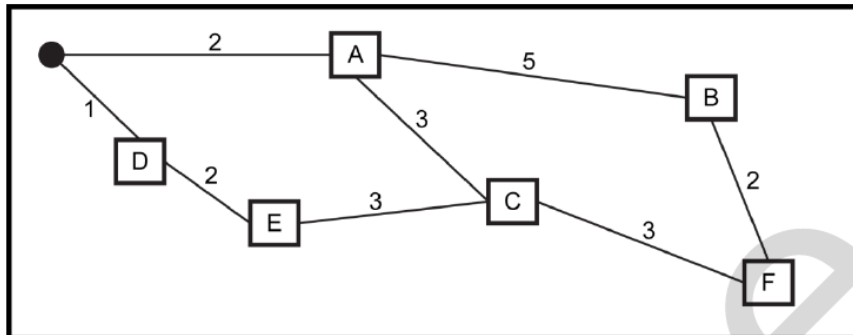Fig 6.1 shows an example map of places that the salesman visits.

Fig 6.1

The filled in circle represents the start and end point. The letters represent the places to visit. The lines are the routes available and the numbers are the length of time each route takes to travel.

(a) Explain how abstraction has been applied in the production of Fig 6.1

....

....

....

.... **[2]**

Question3

Q) What is meant by the terms Time Complexity and Space Complexity when discussing the complexity of algorithms? *(4 marks)*

Answer 1		
e.g. • Track name • Car type • Driver name	**3** **AO2.1** **(3)**	Allow any reasonable alternative

Answer 2

6	a	1 mark per bullet to max 2 e.g. • Places have been replaced with variables ... (1) • ...e.g. a place has been replaced with A(1) • Irrelevant information has been removed... (1) • ... e.g. only the routes and places are shown(1) • Time is given as a numeric value(1)... • ...e.g. 1 rather than 1 hour, or 1 minute(1) • Relative geographic location may not be accurate (1) • ... e.g. positions of the towns may not be proportional to actual distance (1)	**2** **AO1.2 (2)**

Answer 3

Time Complexity refers to the amount of time it takes for an algorithm to execute (1), in the worst case (1).

Space Complexity refers to the amount of memory that is required for an algorithm to execute (1), in the worst case (1).