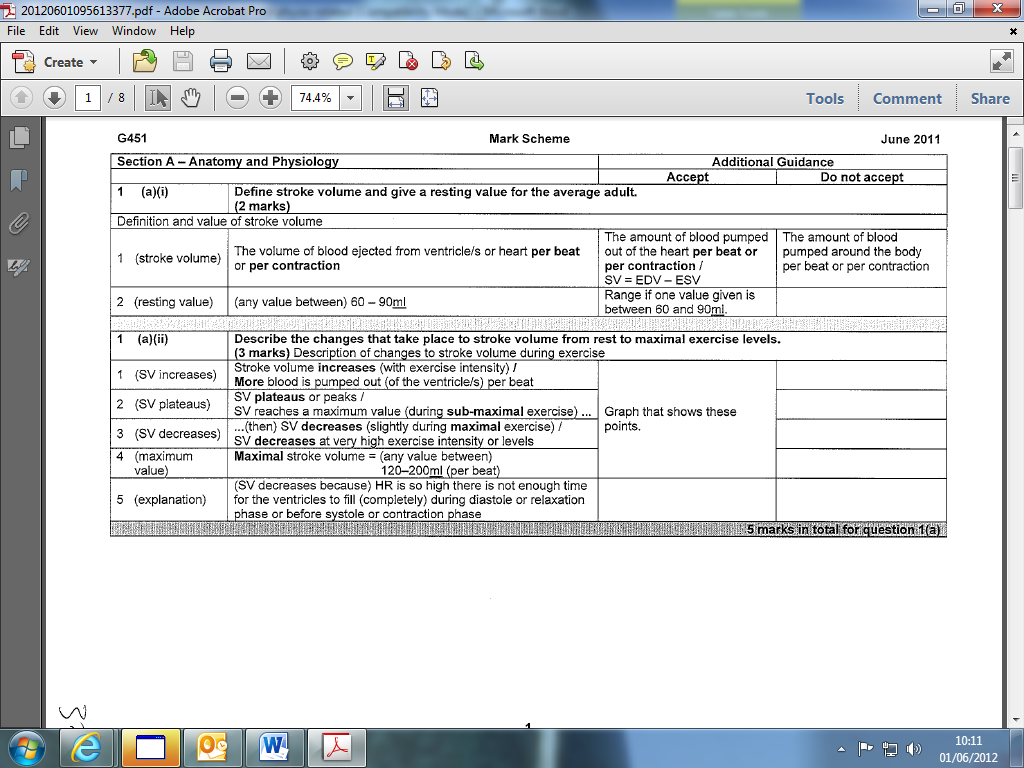
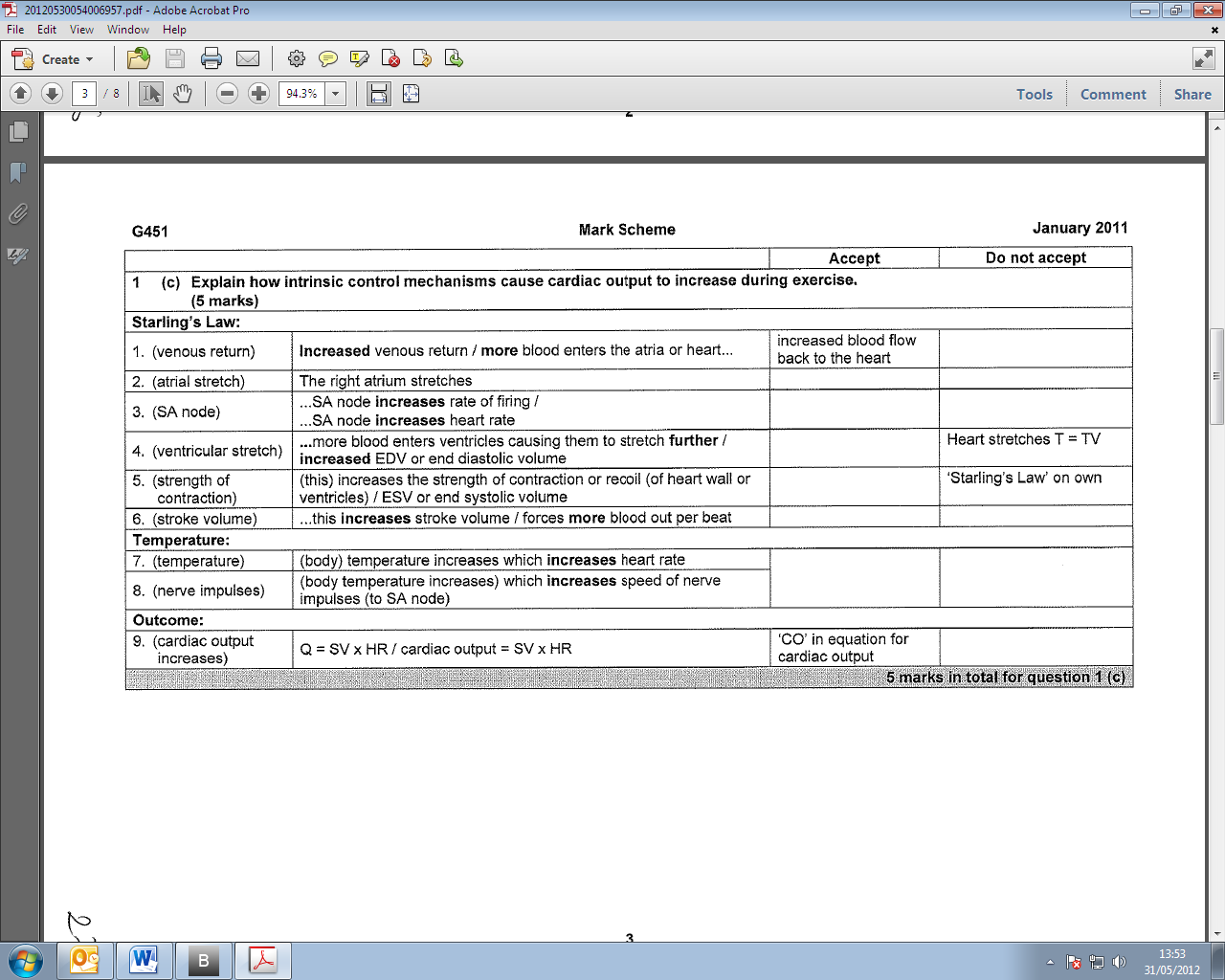
MARK SCHEME FOR EXTENSION TEST ON CARDIAC CYCLE

1. **.**

**(i) Define stroke volume and give a resting value for the average adult. (2 marks)**



1. **Cardiac output increases during physical exercise. Explain how intrinsic control mechanisms cause cardiac output to increase during exercise. (5 marks)**



1. **Draw a graph to show how the cyclist’s cardiac output changes in the following phases of the aerobic training session.   
   Prior to exercise Exercise Session Recovery period (5 marks)**

(One mark must be from three areas to attain maximum)

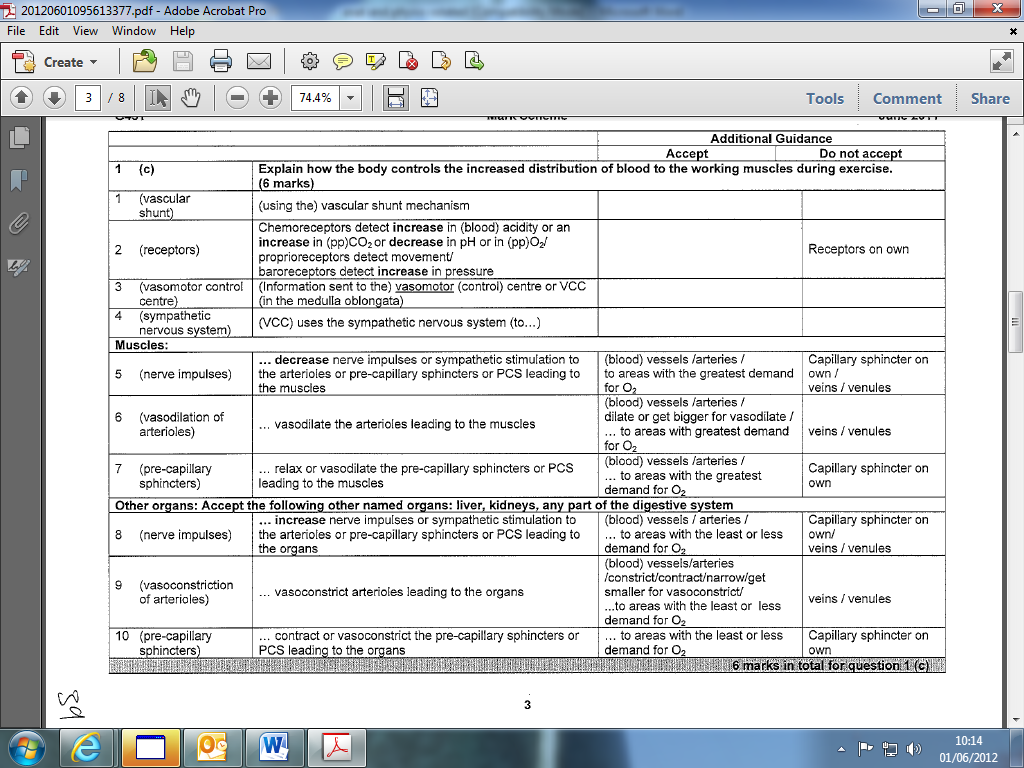
1. Resting value 5L/min approx (4-6L/min)
2. Anticipatory rise before exercise
3. Sharp increase
4. Plateau between 10-2OLImin
5. Initial sharp decline with slow decline towards resting level
6. **Whilst exercising a greater volume of blood is ejected during ventricular systole. Why is this beneficial to performance? [I mark]**

2More oxygen/blood supplied to muscles

3Greater amounts of carbon dioxide/waste products removed/delay OBLA

4Delays fatigue/maintains/prolongs aerobic performance

1. **Explain how the body controls the increased distribution of blood to the working muscles during exercise (6 marks)**



1. **How do neural factors regulate heart rate during physical activity and during a period of gradual recovery. (5 marks)**

During activity

* Chemoreceptors detect decreases in O2/ pH of the blood/increases acidity /CO2/Lactic acid
* Proprioreceptors detect movement
* Baroreceptors detect increases in blood pressure
* Messages are sent to the cardiac control centre/ CCC (in the medulla oblongata)
* Stimulate CCC
* S/A node stimulated / the (cardiac) accelerator nerve
* SA node reference only when linked to physical activity(not recovery)
* The sympathetic nervous system increases heart rate

During recovery

* Chemoreceptors detect increases in the O2/ pH of the blood/ decreases in acidity /co2/Lactic acid
* Proprioreceptors detect reduction in movement
* Baroreceptors detect decreases in blood pressure
* Messages are sent (to the S/A node) via the vagus nerve
* The parasympathetic nervous system decreases heart rate.