



GCE MARKING SCHEME

**APPLIED SCIENCE
AS/Advanced**

JANUARY 2012

INTRODUCTION

The marking schemes which follow were those used by WJEC for the January 2012 examination in GCE APPLIED SCIENCE. They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

ASC1

Section A

Question		Answer	Marks
1		Practice of boosting the number of red blood cells (RBCs) in the bloodstream (in order to enhance athletic performance).	1
2		Any two from: (Results of) <ul style="list-style-type: none"> • Urine tests • blood tests • Haematological profile • A steroids profile 	2
3		Homologous transfusion - RBCs from a compatible donor Autologous transfusion - the athlete's own RBCs	1 1
4		Any of: <ul style="list-style-type: none"> • Communication of infectious diseases • Possibility of a transfusion reaction 	1
5		(Growth factor that) stimulates the formation of RBCs	1
6		Any two from: <ul style="list-style-type: none"> • Tiredness / lethargy • Shortness of breath • Palpitations • Headache • Tinnitus • A sore tongue • Difficulty swallowing • Light-headedness / dizziness 	2
7		Biconcave shape No nucleus	1 1
8		Thrombocytes – clotting of the blood. Leucocytes – defend the body from infection. (NOT fighting/eating bacteria) Plasma – carrying cells/site of chemical reactions / carrying other substances such as hormones	1 1 1
9		Haemocytometer	1
10		No – inconclusive, therefore, another test required. As heamocrit exceeds level but haemoglobin does not, therefore, no ban.	1 1
11		Prevent interference with samples / substitution of samples.	1
12		Designated sharps box.	1
13		Prevent infection (of blood-borne diseases)	1

Question		Answer	Marks
14		Any two from: <ul style="list-style-type: none"> • So tester cannot be accused of tampering with equipment • Transparency of testing • Rider have evidence of test occurring Not: Check equipment is clear	2
15		$(40/136) * 100$ $= 29.4\%$	1 1
16	(a)	Increase in gradient/elevation at 80 miles	1
	(b)	Any two from: <ul style="list-style-type: none"> • Greater O₂ demand/need more O₂ • increased respiration rate /for the muscles 	2
	(c)	Sprint to the finish / increased aerobic demand	1
	(d)	Stress / drugs / medical conditions / shock	3
Section A Total			31

Section B

Question			Answer	Marks
17	(a)	(i)	Spirometer	1
		(ii)	Sphygmomanometer	1
		(iii)	Peak flow meter	1
		(iv)	Pulse rate meter, ECG	1
	(b)	A hazard is something that can cause harm. A risk is the chance that any hazard will cause somebody harm.	1 1	
18	(a)	Any two from: <ul style="list-style-type: none"> • Muscles around the walls of the airways tighten • The airways become narrower • The lining of the airways becomes inflamed • Sometimes sticky mucus or phlegm builds up 	2	
	(b)	Any two from: <ul style="list-style-type: none"> • Animals • Air pollutants • Colds & viral infections • Emotions • Exercise • House-dust mites • Medicines • Moulds & fungi • Pollen • Sex • Smoking • Cold weather 	2	
	(c)	Relax the muscles surrounding the narrowed airway / allows the airways to open wider / making it easier to breath again.	3	
	(d)	(i) Axis (1) / plotting (2) / scale (1) (If line graph –max of 2) (ii) Any one from: <ul style="list-style-type: none"> • Greater access to preventative care • Better awareness • Population closer to the hospitals 	4 1	

Question			Answer	Marks
19	(a)	(i)	Pulmonary artery	1
		(ii)	Mitral valve/bicuspid valve	1
		(iii)	<u>Right</u> atrium	1
		(iv)	<u>Left</u> ventricle	1
	(b)		Pressure is higher in the left-hand side of the heart	1
			Needs to pump blood further	1
	(c)		Generates its own electric impulse	1
	(d)	(i)	Sends the impulse from the atria to the ventricles	1
		(ii)	Contraction is initiated	1
		(iii)	Carry (oxygenated) blood from the lungs to the left atrium	1
		(iv)	Slows down the impulse	1
	20	(a)		Sally
			Any two from:	
			• Vital capacity higher	2
			• Heart rate lower	
(b)		(i)	a) Minimum arterial pressure during relaxation	1
			b) Maximum arterial pressure during contraction	1
(c)	(ii)	Jonathon	1	
	(iii)	Any two from:	2	
		• Smoking		
		• Poor diet		
		• Obesity		
		• Stress		
	(c)		Sophia – due to high pulse rate.	2
21	(a)		Any three of:	3
			IV Injection of radioactive isotope, emits beta/alpha (not gamma) radiation, pick a particular isotope that gathers at the aneurysm / passage through the arteries, detected and analysed	
	(b)		Killing cancerous cells	1
	(c)	(i)	Elastic walls / thick muscle layer	2
		(ii)	High cross-sectional area of capillaries, friction on vessel walls	2
(d)		Cost / resources	2	
Section B total				49
OVERALL TOTAL				80



WJEC
245 Western Avenue
Cardiff CF5 2YX
Tel No 029 2026 5000
Fax 029 2057 5994
E-mail: exams@wjec.co.uk
website: www.wjec.co.uk