



GCE MARKING SCHEME

**APPLIED SCIENCE
AS/Advanced**

SUMMER 2013

INTRODUCTION

The marking scheme which follows was used by WJEC for the Summer 2013 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 scheme was 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 this marking scheme.

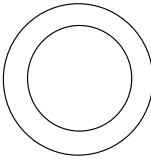
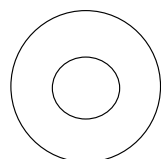

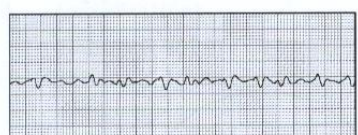
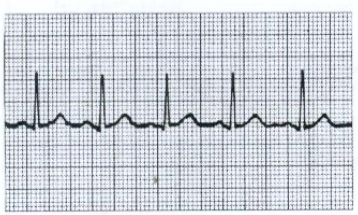
**GCE APPLIED SCIENCE – ASC1
MARK SCHEME – SUMMER 2013**


SECTION A

Question		Answer	Marks
1		Prevent spread of virus (Not: bacteria)	1
2	(a)	Any one of: <ul style="list-style-type: none"> • Asthma • Bronchitis • Emphysema • COPD • Lung cancer 	1
	(b)	Any two of: <ul style="list-style-type: none"> • Chronic heart disease • Chronic kidney disease • Chronic liver disease • Chronic neurological disease • Immunosuppression • Diabetes mellitus • Pregnant women • 65 and over Not: asthma	2
3	(a)	Week 42 (or 43) (Not: October)	1
	(b)	188 x 30 = 5640 (Allow: 5550-5700) <i>Reading value off graph 1, calculation 1</i>	2
	(c)	100	1
	(d)	Any two of: <ul style="list-style-type: none"> • No cases • Few cases • No recorded data • Not significant • Below normal seasonal activity • On baseline • AVP 	2
4		Prevent spread of virus due to contact with doctor / other patients	2

5	(a)	Any two from: <ul style="list-style-type: none"> • Coughing • Runny nose • Sore throat • Shortness of breath 	2
	(b)	Upper – Q and S Lower – R and P	2
	(c)	Any three from: <ul style="list-style-type: none"> • Less CO₂ from blood into alveolus. • Less O₂ from alveolus into blood (1) by diffusion (1) • Keeps airway open / support • Lowers the surface area 	3
	(d)	Mucous. Waft dirt / bacteria / mucous back up. (All correct 2, 2 correct 1)	2
6	(a)	Caerphilly	1
	(b)	Decrease = $67.6 - 24.6 = 43$ (1) % decrease = $43/67.6 \times 100$ (1) = 63.6% (1)	3
	(c)	Ensure adequate treatment. Ensure adequate health professionals available.	1
7		Not all affected / too expensive / to target resources	1
8	(a)	Antibiotics only affect bacteria / do not kill virus / only used for secondary infections / reduce over-use of antibiotic / allergies / already had swine flu.	1
	(b)	Any two of: <ul style="list-style-type: none"> • Patient if not considered at risk of further complications. • Patient is not at risk to any other vulnerable groups. • Patient is otherwise fit and healthy. • Allergies. • Patient has another condition that could be affected by anti-virals. • Does not cure, only relieves symptoms 	2
		Total	30

SECTION B

Question		Answer	Marks	
9	(a)	<p>A – Vein. B – Artery. NOT: Vena cava or aorta</p>	2	
	(b)	<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p style="text-align: center;">A Vein B Artery</p> <p>A wide lumen and thin wall (1) B narrow lumen and thick wall (1)</p>	2	
	(c)	<p>Any two of: Close proximity to muscles – prevents pooling / squeezing effect (2) Smooth endothelium – to reduce, friction / resistance to blood flow (2) Valves – to prevent backflow (2)</p>	4	
10	(a)	(i)	<p>Electrocardiogram Electrical activity of heart</p>	2
		(ii)	<p>Sphygmomanometer Blood pressure</p>	2
		(iii)	<p>Spirometer Pulmonary function tests (owtte e.g. breathing rate, vital capacity)</p>	2
		(iv)	<p>Peak flow meter Peak Expiratory flow</p>	2
	(b)	125 / 80 <u>mmHg</u> (unit needed)	1	
(c)	<p>Match diagnosis and equipment.</p> <p>300 dm³ min⁻¹ C</p> <p>12-15 breaths per minute D</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <p>B</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">  <p>E</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">  <p>A</p> </div> <p style="text-align: right; margin-top: 10px;"> All correct – 3 3 correct – 2 2 correct – 1 </p> <p>Marks awarded for D, B, E & A.</p>	3		

Question		Answer	Marks
11	(a)	Any four of: <ul style="list-style-type: none"> • X-Ray / radiation passes through body / soft tissue • Radiation / X-Ray produces an image • X-Ray film / image / picture acts as a record • Image dark where most gets through / shadow image / bones white or light grey / bones give better contrast • Different tissues absorb different amounts of X-Rays • Bones / denser material, absorbs more radiation • Soft tissues absorb less radiation 	4
	(b)	Any three of: <ul style="list-style-type: none"> • Wear badge / dosimeter to monitor radiation • Leave area of scanner when operating • Wear a lead apron • Stand behind lead glass screen • Focus X-rays 	3
	(c)	Any two of: <ul style="list-style-type: none"> • MRI scanner is based on magnetism / magnetic field / magnet • Induces eddy currents • Heating may damage tissues / blood vessels • Distorts image • Heating effect 	2
12	(a)		1
	(b)	Haemoglobin No nucleus	2
	(c)	Any two of: <ul style="list-style-type: none"> • Out pulmonary artery • Returning pulmonary vein • Via lungs 	2

Question		Answer	Marks
13	(a)	Plot (2) (correctly plotted line / bar chart) Axes and scale (2)	4
	(b)	<22% Reasons: <ul style="list-style-type: none"> • Trend is decreasing. • Smoking ban. • Increased awareness of effects. • Health warning on packets. • Ban on cigarette advertising. • Displays are covered <p>Two marks for lower percentage <u>and</u> two reasons. One mark for lower percentage <u>and</u> one reason.</p>	2
	(c)	(i) £3,712.80 (accept answers in range £3712-£3725) (ii) £107.10 (accept answers in range £107-£108)	2
	(d)	Any two of: <ul style="list-style-type: none"> • Stress • Obesity • Drugs / alcohol • Lack of exercise • Emotions • Age • Family history • High salt diet • Pregnancy 	2
14	(a)	Both correctly labelled. (Right – bicuspid, left – tricuspid).	2
	(b)	Any three of: <ul style="list-style-type: none"> • Increase in blood pressure in atria forces AV valve open • AV valve is forced shut by blood pressure in <u>ventricles</u> • Correct reference to pressure differences between chambers • Tendons prevent inversion • Prevent backflow of blood 	3
	(c)	Supply blood to heart <u>muscle</u>	1
Total			50



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