Assessment Schedule – 2005

Human Biology: Describe functioning of the human circulatory, respiratory, and excretory systems (90178)

Evidence Statement

Q	Achievement	Achievement with Merit	Achievement with Excellence
1(a)	Description of blood pressure figures 110 / 70. Response should refer to **both** figures. • 110 is the systole / systolic pressure / the pressure against which the heart pumps / working pressure. • 70 is the diastole / diastolic pressure / the pressure against the resting heart / resting pressure. Note: if not recognised 110 / 70 but recognised this as low bp =A.	Explanation of the blood pressure figures 110 / 70. As for Achievement, ***plus*** ONE of: • These figures mean that the person has low / lower than average blood pressure. • This indicates a healthy heart / blood system / low risk of heart attack. • Wide difference between numbers indicates a healthy blood pressure.	
1(b)	Description of hypertension: • Hypertension means [the person has] high blood pressure.		
1(c)	Description of what could be happening inside blood vessels or to heart. Response should refer to an aspect of the circulatory system (NOT an [related] aspect of the person's life-style). Eg • coronary arteries / vessels clogged / narrowed / plaque build-up / restricted / hardened / less elastic • enlarged heart. NOT BLOCKED (totally)		
2(a)	Description of the function of named components. THREE out of FOUR responses correct. • White blood cells defend the body against pathogens / make antibodies / engulf bacteria / fights disease. • Platelets are needed to clot the blood when wounded / produce fibrin (threads). • Plasma is the liquid part of the blood, which allows **transport** of substances. • Red blood cells **transport** oxygen. NOT GERMS / BAD BACTERIA		

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2(b)	Description of TWO **structural** differences between the aorta and vena cava. The description must be given for **both** the aorta and vena cava. Any TWO of: • Aorta has thick (walls) while the vena cava has thin (walls). • Aorta has elastic (walls) while the vena cava has inelastic (walls). • Aorta doesn't have valves while the vena cava does. • Aorta has smaller diameter / lumen than vena cava.	Explanation of the importance of ONE of the structural differences for Achievement. The description must refer to both the aorta and vena cava to indicate a difference ie ONE **difference** and ONE **explanation** needed. ONE out of TWO responses correct. • Aorta is thick-walled as it carries blood under pressure, while the vena cava is thin walled as it carries blood which is not under pressure. • Aorta has elastic walls to cope with / even out the surge of blood from the pumping heart. The vena cava is inelastic as the surge of blood from the pumping heart is no longer apparent. • Vena cava has valves to prevent the backflow of blood as the flow of blood is now sluggish in comparison with the flow of blood in the aorta. • Aorta has smaller lumen to keep blood under high pressure. Vena cava has larger lumen to deal with larger volume of blood under low pressure.	
	Note. Don't need to refer to both vessels in the same sentence. The opposite can be inferred.		
2(c)	Description of the main difference in the blood composition between the pulmonary artery and pulmonary vein. The response must refer to **both** the artery and the vein. • **Pulmonary vein** carries oxygenated blood / more oxygen / less carbon dioxide while the **pulmonary artery** carries deoxygenated blood / less oxygen / more carbon dioxide.		

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2(d)	Describes **what** the purpose of capillaries is. • Capillaries are very thin / small / narrow / thin-walled blood vessels that **exchange materials** between the blood and the cells. **OR** • Capillaries lie close to body cells / in contact with all body cells to allow short distance for exchange of materials / diffusion. **OR** • Heat loss. **OR** • link arteries and veins • exchange molecules eg gases **"Food" and "Waste" OK here in lungs**	Explanation of **how** the capillaries exchange substances. Response needs to refer to materials entering **and** exiting cells. Any TWO of: • Materials needed by cells **diffuse** into them eg oxygen / glucose / nutrients / hormones. • Materials not needed by the cells / waste products **diffuse** out of them into the blood eg (urea) / carbon dioxide / water. • Materials produced by the cells **diffuse** into capillaries for transport eg hormones / antibodies. • Heat is carried in the blood by convection and is radiated from the body because capillaries containing this warm blood lie very close to skin surface. • **Diffusion** of gases / substances, into or out of the blood (into the lungs / out of the gut).	Discuss capillary structure linked to functions. Responses refer to specific material entering and exiting cells Link: how, why, what, where ie How the substance is exchanged and why (is this substance important) eg Oxygen diffuses from the capillary into the cell for respiration How – why Why – where How - where
		Cannot say just "food" or "waste" as these terms are too general.	
3(a)	Description of function of goblet cell. Eg secretes / produces / makes mucus.		
3(b)	Identifies that cilia move (mucus).	Explanation of **why the cilia move** mucus containing / trapping unwanted substances / dust / dirt / bacteria / pathogens being **moved up** / away from respiratory system. Eg dust sticks to mucus and **cilia move the mucus up and out of lungs.**	
3(c)	ONE of the following effects of smoking identified or described: • cilia clogged with tar / coated in tar / tar paralyses cilia / damage • Mucus membrane irritated / inflamed / over secreted. **NOT KILLS**	One of the effects identified and **why** it affects function. Cilia become coated / clogged with tar, impairing their function. This reduces the ability of the cilia to keep lungs free from unwanted substance. This causes an increased risk of infection / coughing to rid body of unwanted substances. Mucus membrane becomes irritated / mucus production increases / increased coughing to rid body of mucus.	

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3(d)	Describes function of alveoli as gas exchange OR mentions both gases. Eg oxygen is exchanged for carbon dioxide. Answer MUST imply **gas exchange**.		
3(e)	Answers identify damage to the alveoli. Eg TWO of: • capillaries broken • alveoli broken / air sac walls destroyed • alveoli bigger / overinflated • alveoli lost elasticity. ***Note they need to specify / identify damage.***	Identification of ONE damage **and** ONE **explanation** of how this effects the respiratory system Eg • Broken capillaries → reduced diffusion / transport of gases / less oxygen in blood / more carbon dioxide in blood. • Alveoli broken → reduced surface area for gas exchange. • Alveoli overinflated → reduced surface area for gas exchange. • Loss of elasticity → breathing harder / less effective.	Consequence of this damage on the whole system / lung / individual. Less oxygen available to the body. Person tired from lack of oxygen / too much CO_2.
4(a)	Identifies or describes any TWO of: Glucose, urea, amino acids, water, salt(s), ions, mineral. NOT **urine.**		
4(b)	Any idea of: • substances forced from blood by high pressure in the glomerulus.	High pressure in blood vessel **pushes** (forces) substances from blood into tubule / Bowman's capsule. Eg pressure of the blood in the glomerulus forces the substances into the tubule. NOT **diffusion**	
4(c) (i)	Names any TWO of: Red blood cell / white blood cell / blood cells / proteins.		
4(c) (ii)	Describes why the substances cannot enter the kidney tubule. Eg Cells / protein too big / large to pass through (the filter).	Identifies **why / what** the named substances cannot enter the kidney tubule. Eg Blood cells / proteins too large to pass through **capillaries in glomerulus and into Bowman's capsule.** **OR** Blood cells / proteins too large to pass through **glomerulus cell membrane / glomerulus capillary wall.**	

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4(d)	ONE idea of: • *Hot weather*, body loses lots of water through sweat / blood has less water (blood thicker). More water is reabsorbed from the kidney / urine more concentrated • *Cold weather*, blood has more water in it / less water is reabsorbed from kidney tubule. More urine made / urine less concentrated.	**Explains why** *Hot weather,* body loses lots of water through sweat, blood has less water (blood thicker): filtrate in kidney tubule has more water reabsorbed into surrounding capillaries. Urine darker in colour. **OR** *Cold weather*, body does not sweat as much – blood has more water: / filtrate in kidney tubule has less water reabsorbed into surrounding capillaries – urine lighter in colour. ***Must say why for M***	
4(e)	Describes the function of the kidney **OR** Describes the blood composition of the renal artery **OR** renal vein. Eg Any idea of • Kidney filters / removes urea from the blood. • Kidney removes water, much urea, excess salts. • Kidney removes harmful substances. **OR** • Renal artery blood high in urea / water / salts. • Renal vein has less water / little urea / less salts.	Explains **how** the kidney filters the waste **AND** Identifies some difference between the blood composition of the renal artery and the renal vein Eg • Urea / water / salts / glucose move from blood by **high pressure** into Bowman's capsule. • Filtrate / urine moves along kidney tubule (nephron). Useful substances required by the body are **reabsorbed** into the blood like glucose / some water / some salts. Identifies ONE difference of: • renal artery blood high in urea, renal vein blood low in urea • renal artery blood high salts, renal vein blood low in salts • renal artery and vein blood same glucose concentration • renal artery blood high in water, renal vein blood lower in water.	Shows **a difference** in the composition of the renal artery and the renal vein Naming specific molecules / substances **AND** **How** the kidney as a whole removes toxins and retains nutrients Eg Renal artery carries substances to the kidney. These include glucose / amino acids / salts / water / urea. The renal vein contains glucose / amino acids / some salts / some water **/ no urea.** Nephrons remove / filter out toxins / waste products. Nephrons reabsorb nutrients (active transport) / loop of Henle reabsorbs water / Na pump assists salt diffusion. **Note** ***Diffusion in tubule not glomerulus.***

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
NINE opportunities answered at Achievement or higher, with a minimum of 2 × A for each section. 9 × A	NINE opportunities answered, with a minimum of 2 × A for each section, plus a minimum of TWO at Merit level or higher from any one section. 2 × M *plus* 7 × A	NINE opportunities answered, with a minimum of 2 × A for each section, plus a minimum of ONE at Excellence and ONE at Merit level from any one section. 1 × E *plus* 1 × M *plus* 7 × A