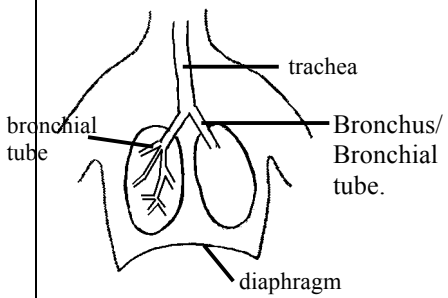
Assessment Schedule – 2007

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

Evidence Statement

Question	Evidence Contributing to Achievement	Evidence Contributing to Achievement with Merit	Evidence Contributing to Achievement with Excellence
ONE (a)	*Describes any TWO of:* e.g. • Platelet [cell fragment] needed in **clotting blood**/for healing. • Phagocyte engulfs pathogens / named pathogen / foreign material that has entered the body. • Lymphocyte helps to start immune response / produce antibodies.		
(b)	*Describes **structure** of a phagocyte. ONE of, eg:* • Has a nucleus. • Cytoplasm / membrane can flow / able to move. • Can change shape. *OR* *Describes **function** of a phagocyte.* [Do not accept C shaped or has a mouth/mouth shaped]	*As for Achievement, plus **links** the structure to a function. ONE of: eg* • Cell is living and can move to site of infection. • Engulfs pathogens by flowing around them. • Can squeeze between the cells of the capillary walls [to go to site of infection].	
(c)	*Describes ONE feature of the **shape** of a RBC eg:* • Biconcave [disc] • Like a wine gum / doughnut without hole / dumbbell shape • Thin in middle / top to bottom • Smooth / flexible / not rigid surface. **Not a diagram on its own** *OR* *Describes large surface area of RBC.*	*As for Achievement, plus **links** the shape to a function, eg ONE of* • Allows for rapid / greater diffusion / movement of oxygen in / out [by increasing surface area]. • Biconcave shape increases SA of cells so **more** oxygen can bind to RBC to be transported around body. • Allows for easy passage through [tiny] capillaries.	
(d)	*Correct pathway both sides.* 		

(e)	*Describes action of **valves.** Any ONE of*: • Valves close to stop backflow of blood. • Allows blood to flow in one direction. **Do not accept backflow in veins or valves when not relating to the heart.**	*Explanation **links** the location to the action. ONE of eg:* • Valves between the atria and ventricles **close** when the ventricles pump [to stop backflow of blood]. • Valves between the ventricles and arteries **open** when the ventricles pump [to allow forward passage of blood].	
(f)	*Describes THREE structural features of arteries and/or veins* ***OR*** *TWO structural comparisons between arteries and veins; must **clearly distinguish between** arteries and veins eg:* • Arteries thick-walled; veins thin-walled. • Arteries have elastic walls; veins inelastic walls. • Arteries don't have valves; veins have valves. • Arteries have smaller diameter / lumen; veins have much larger diameter / lumen.	*Explanation clearly **links** the structure to the function for THREE features of arteries or veins **or** TWO differences between arteries and veins eg:* • Arteries thick-walled to withstand the pressure of the pumping heart; the blood in veins is not under pressure. • Arteries have elastic walls to ease out the surge as the heart pumps, so getting a steady flow; the veins do not experience a surge. • In arteries the blood is under high pressure so is kept moving. In the veins there is low pressure so the valves assist in keeping the blood flowing / returning it to the heart / stop backflow. • Veins have a larger diameter than arteries to reduce the resistance of blood flow so assisting the return of [low pressure] blood to the heart.	*Discussion which **links three** different functions for **BOTH** arteries and veins into an **in-depth** and **comprehensive** answer.*
TWO (a)	*THREE different structures drawn and labelled correctly eg:*  *[accept diagram if it only shows one side]*		

(b)	*Description of how air moves out due to changes in the diaphragm **and** intercostal muscles, eg:* • When the diaphragm moves up / relaxes / returns to dome shape [air rushes out]. **AND** • The (intercostal) muscles relax and the rib cage / chest moves down [and air rushes out]. **OR** The intercostal muscles and diaphragm relax. The space inside the thorax decreases; pressure in the thorax decreases [air is forced out of the lungs]. Breathing out = not achieved		
(c)	*Bands/rings of cartilage.*		
(d)	*Describes mucus or cilia, eg:* • Air passages are lined with a sticky substance called mucus. **OR** • Air passages are lined with small hair-like structures called cilia.	*Explains mucus and cilia by **linking** structure to function, eg* • The air passages are lined with a sticky substance called mucus which traps inhaled dust / pathogens / debris. **AND** • Small hair-like structures called cilia move the mucus upwards **so** it can be coughed out / spat out / swallowed.	
(e)	*Describes ONE effect on lung functions, eg:* • Lines alveoli with tar. • Reduces surface area of alveoli • Destroys thin walls of alveoli • Reduces efficiency of gas exchange.	*Explains how damage affects lung function by reducing surface area and the impact this has on gas exchange, eg:* Thin walls of alveoli damaged ⇨ less surface area / less elasticity for gas exchange / diffusion of oxygen. **OR** Damaged alveoli have reduced surface area ⇨ less oxygen diffuses into body ⇨ respiration (rate) decreases, causing tiredness/breathlessness.	

(f)	*Describes direction of oxygen AND carbon dioxide movement, eg* Oxygen moves / diffuses from alveoli into capillaries. **AND** Carbon dioxide moves / diffuses from capillaries into alveoli. **OR** Describes direction of **one** of the above gases **and** describes thin-walled alveoli / capillaries allow gas to pass quickly through.	*Explains the movement of gases linked to **diffusion** AND **concentration gradient*** Eg as for Achievement **plus**: Oxygen **diffuses** into the blood / carbon dioxide out of the blood / because of a difference in the concentration gradient / because the gases move from an area of high concentration to low concentration.	*As Merit **plus** relates **how** the concentration gradient is maintained **OR how** the features of the moist, thin-walled structures assist gas exchange, eg:* Oxygen diffuses from the (moist) thin-walled alveoli which are higher in oxygen concentration, into thin-walled capillaries which are lower in oxygen concentration. As soon as oxygen diffuses into the capillaries, the blood flows along (back to the heart) so oxygen concentration is kept low (does not build up) in the capillaries which lie close to the alveoli. Oxygen continually diffuses along the concentration gradient as described above. Carbon dioxide diffuses in the opposite direction (from capillaries into alveoli air space) because it was in higher concentration in the blood. As soon as (deoxygenated) blood flows past the alveoli, more (deoxygenated) blood flows by, higher in carbon dioxide concentration. So CO_2 is continually diffusing into the alveoli. Both gases diffuse more rapidly in opposite directions when they dissolve in the thin moist alveoli lining.
THREE (a)	*Names THREE out of FOUR correctly* A – kidney B – ureter C – bladder D – urethra		
(b)	*Describes BOTH correctly eg* B – to carry **urine** from kidney <u>to</u> **bladder [not urea]** C – to store **urine** [before passed out / expelled from body].		

(c)	*Identifies TWO components, eg:* Protein **AND** blood cells / any named blood cell type. **OR** describes *idea of:* They are **large** molecules.	*As for Achievement PLUS:* ***links** size of molecules as to why they remain in blood, eg:* Large molecules in blood **cannot pass through the** membranes of glomeruli / capillaries into the nephrons / Bowman's capsule.	
(d)	Urea toxic / poisonous / harms body / cells.		
(e)	*Describes* All glucose **reabsorbed**. **OR** Glucose is needed by the body.	*Explains why, eg:* All glucose **reabsorbed** back [into capilliaries from (nephron) tubules] into blood as needed for **respiration** or for **energy.**	
(f)	*Describes* Damaged glomeruli **cannot filter** blood as well / successfully / efficiently as a healthy kidney.	*Explains **how** functioning glomeruli **differ** from damaged glomeruli, eg:* Healthy / functioning / normal glomeruli filter blood to remove urea / excess salt / excess water but blood cells are not filtered, whereas damaged glomeruli **cannot filter** blood as well / successfully / efficiently. The filtrate may have proteins present when normally they are absent **OR** urea / excess salt / excess water may not be all removed from blood.	[Filtration is no longer selective, large molecules are found in the urine]

(g)	*Describes ONE of linked to urine colour* **During sleep** • cannot drink / eat • kidneys reabsorb water to maintain body water level • BMR slows down ***so urine looks dark yellow.*** **OR** **During the day** • drink more / eat food • circulation increased • respiration increases • BMR increases ***so urine looks paler (yellow).***	*As for Achievement, plus:* *explains a **reason** for a **difference** in urine colour <u>from morning to end of the day</u> eg:* **ONE of:** • During sleep no water / food enters the body. Kidneys reabsorb water to maintain body fluid / blood make-up (homeostasis). Urine dark yellow in morning. During the day the body takes in water / food / fluids. Kidneys filter excess water from blood – urine paler (yellow). • During sleep (BMR) / respiration decreases. Less water produced by the body – urine dark yellow. During the day (BMR) / respiration increases, water produced as a waste product by the body is removed by the kidneys – urine paler (yellow). • During sleep (heart rate slows down) blood flow to kidneys reduced, less water filtered out of blood – urine dark yellow. During day, increased body activity increases blood flow around body. More blood is filtered by kidneys – urine paler (yellow).	*Explains **TWO** reasons in merit and links the ideas coherently.*

Judgement Statement

Achievement
Total of NINE opportunities answered at Achievement level, with a minimum of THREE achieved from each organ system.

Achievement with Merit
As for Achievement (total of NINE opportunities answered), with at least TWO at Merit level from ONE organ system.

Achievement with Excellence
As for Achievement (total of NINE opportunities answered), with at least ONE at Excellence level **and** ONE at Merit level from ONE organ system.