RECOGNISING ACHIEVEMENT

Subject: Transport Code: 2803 / 01

Session: January Year: 2001

Mark Scheme

MAXIMUM MARK	60

ADVICE TO EXAMINERS ON THE ANNOTATION OF SCRIPTS

1. Please ensure that you use the **final** version of the Mark Scheme.
   You are advised to destroy all draft versions.

2. Please mark all post-standardisation scripts in red ink. A tick (✓) should be used for each answer judged worthy of a mark. Ticks should be placed as close as possible to the point in the answer where the mark has been awarded. The number of ticks should be the same as the number of marks awarded. If two (or more) responses are required for one mark, use only one tick. Half marks (½) should never be used.

3. The following annotations may be used when marking. No comments should be written on scripts unless they relate directly to the mark scheme. Remember that scripts may be returned to Centres.

   x = incorrect response (errors may also be underlined)
   ^ = omission mark
   bod = benefit of the doubt (where professional judgement has been used)
   ecf = error carried forward (in consequential marking)
   con = contradiction (in cases where candidates contradict themselves in the same response)
   sf = error in the number of significant figures

4. The marks awarded for each part question should be indicated in the margin provided on the right hand side of the page. The mark total for each question should be ringed at the end of the question, on the right hand side. These totals should be added up to give the final total on the front of the paper.

5. In cases where candidates are required to give a specific number of answers, (e.g. 'give three reasons'), mark the first answer(s) given up to the total number required. Strike through the remainder. In specific cases where this rule cannot be applied, the exact procedure to be used is given in the mark scheme.

6. Correct answers to calculations should gain full credit even if no working is shown, unless otherwise indicated in the mark scheme. (An instruction on the paper to 'Show your working' is to help candidates, who may then gain partial credit even if their final answer is not correct.)

7. Strike through all blank spaces and/or pages in order to give a clear indication that the whole of the script has been considered.

8. An element of professional judgement is required in the marking of any written paper, and candidates may not use the exact words that appear in the mark scheme. If the science is correct and answers the question, then the mark(s) should normally be credited. If you are in doubt about the validity of any answer, contact your Team Leader/Principal Examiner for guidance.

Mark Scheme **Page 1 of 7**	**Unit Code** **2803/01**	**Session** January	**Year** 2001	**Version** **Final**
Abbreviations, annotations and conventions used in the Mark Scheme	/ = alternative and acceptable answers for the same marking point ; = separates marking points NOT = answers which are not worthy of credit ( ) = words which are not essential to gain credit ____ = underlining) key words which **must** be used to gain credit ecf = error carried forward AW = alternative wording ora = or reverse argument			

Question **Expected Answers** **Marks**

1

Animal	Plant
✓	×
✓	×
✓	✓
×	✓

one mark per row **4**

[Total: 4]

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Question	Expected Answers	Marks
2 (a)(i)	**A =** artery, **B =** vein;	**1**
(ii)	**X =** tunica externa / outer coat / tunica adventitia; **Y =** tunica media / middle coat; **Z** = endothelium / tunica interna / tunica intima;	**3**
(iii)	**X:** collagen / elastic fibres / connective tissue; **Y:** (smooth) muscle and elastic fibres; **(A)** collagen if part of list **Z:** single cell layer / smooth surface / very thin; **(A)** elastin	**3**
(b)(i)	pulsatile / **AW**; declining (slightly); amplitude declines (slightly) / **AW**; ref to correct figures;	**2 max**
(ii)	reflects pumping of heart; ref to elastic recoil effect; detail; decrease / amplitude changes, reflect distance from the heart; AVP; e.g. ref to systole / diastole	**2 max**
(iii)	slows rate; allows exchange (in capillaries); reduce likelihood of damage (arterioles / capillaries); not as elastic (as arteries);	**1 max**

(c) valves;
prevent backflow / **AW**;
(action of surrounding) muscle; NOT muscle in wall of vein
pushes blood / squeezes veins;
large lumen;
little resistance;
ref to negative pressure in, chest / thorax / heart;
ref to gravity effect (from areas above the heart); **4 max**

(d)(i) proteins too large to pass out / **AW**; **1**

(ii) red blood cells, only in blood / not in tissue fluid;
more white blood cells in blood;
platelets only in blood;
ref to (hydrostatic) pressure differences;
ref to dissolved gas levels qualified;
blood in vessels / tissue fluid not in vessels;
AVP; **3 max**

[Total: 20]

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Question	Expected Answers	Marks
3 (a)	loss of water vapour / evaporation; from (aerial) surfaces of plants / leaves; diffusion (of water vapour) through, stomata / into atmosphere / **AW**;	**2 max**
(b)(i)	potometer;	
(ii)	water uptake / **AW**; ® rate of transpiration	
(iii)	cut shoot under water / make sure no air in xylem; insert shoot into potometer underwater / potometer set up under water; dry off leaves / avoid wetting leaves; all joints, air-tight / water-tight; **(A)** no air bubbles in potometer use, healthy / non-wilted, shoot; keep environmental conditions constant; cut stem at slanted angle; allow settling time (before taking measurements);	**3 max**
(c)	3 – 5 pointed star of xylem with phloem indicated between 'arms'; xylem, phloem labelled correctly;	**2**
(d)	phloem; transports away from, leaf / source; ora for xylem	**2**
(e)	out of cell; down a water potential gradient / to lowest water potential / to most negative water potential;	**2**

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(f) xylem transports water / 'carries' water to leaves;
transpiration / evaporation, pulls water up (xylem);
this (evaporation) occurs from, leaves / stomata / aerial surfaces;
blockage of vessels stops upward movement / **AW**;
water lost is not replaced / transpiration still occurs;
cells not turgid (hence wilting);
AVP; e.g. lack of Mg or Fe gives yellowing / leaf death **3 max**

[Total: 16]

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Question	Expected Answers	Marks
4 (a)	0.8 – 0.83 sec / s / second ; 75 ; ecf	**2**
(b)	lengthens cycle (by 0.1-0.2 seconds) / fewer beats per min / slows (heart) rate; ventrical contraction time increased a little; ventrical recovery takes longer;	**2 max**
(c)(i)	small irregular contractions / no pattern / **AW**;	**1**
(ii)	blood will not be pumped / heart attack / death / loss of consciousness;	**1**
(d)	*description is most likely to start at atrial systole*	
1	atria (full of blood) contract / atrial systole;	
2	blood into ventricles;	
3	atrioventricular valves open; **(A)** alternative names	
4	valves in veins stop blood returning to veins;	
5	ventricles contract / ventricular systole;	
6	blood forced into, arteries / aorta and pulmonary artery;	
7	semi-lunar valves open;	
8	atrioventricular valves shut (to stop backflow);	
9	ventricles (and atria) relax / diastole;	
10	semi-lunar valves close (to stop backflow from arteries);	
11	blood enters atria;	
12	some passes through to ventricles;	
13	effect of pressure in closing valves (semi-lunar or atrioventricular);	
14	AVP;	
15	AVP; AVPs to include control by SAN, AVN, Purkyne tissue; ref to papillary muscle	**8 max**
	Q – clear, well organised using specialist terms;	**1**
		9 max
		[Total: 15]

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Question	Expected Answers	Marks
5	carbonic anhydrase; hydrogen carbonate ions / HCO_3^- ; haemoglobinic; buffer/description of buffering; carbaminohaemoglobin;	**5**
		[Total: 5]