3.1 ORGANISMS AND SUBSTANCE EXCHANGE – SURFACE AREA TO VOLUME RATIO – MARK SCHEME

Q1.

(a)
1. Tracheoles have thin walls **so** short diffusion distance to cells;
2. Highly branched / large number of tracheoles **so** short diffusion distance to cells;
3. Highly branched / large number of tracheoles **so** large surface area (for gas exchange);
4. Tracheae provide tubes full of air **so** fast diffusion (into insect tissues);
5. Fluid in the end of the tracheoles that moves out (into tissues) during exercise **so** faster diffusion through the air to the gas exchange surface;
   OR
   Fluid in the end of the tracheoles that moves out (into tissues) during exercise **so** larger surface area (for gas exchange);
6. Body can be moved (by muscles) to move air **so** maintains diffusion / concentration gradient for oxygen / carbon dioxide;

1. Do not accept unqualified references to thin membranes.

Max 2 if any reference to blood

Ignore references to spiracles

5. Accept 'water' for fluid.

Accept 'cells' and 'tissues' as interchangeable words.

3 max

(b)
1. Damselfly larvae has high(er) metabolic / respiratory (rate);
2. (So) uses more oxygen (per unit time / per unit mass);

Idea of 'more / high' is needed for both mark points.

2. Accept 'needs' for 'uses'

2. Ignore references to absorbing / obtaining / uptake of more oxygen

2

(c) Mean SA = 9.85 $\underline{mm^2}$ / 9.9 $\underline{mm^2}$;
Percentage uncertainty of SA = 18.5 / 18.7 / 19;

If both answers incorrect 1 mark for

Percentage uncertainty of dimensions 11.8 / 12 and 6.70 / 6.7
Surface area correctly calculated with correct units but not rounded to appropriate sf (9.8532 $\underline{mm^2}$)
Surface area correct (with appropriate sf) but no / incorrect unit given

Both answers correct = 3 marks

1 answer correct only = 2

Both answers incorrect = max 1

3 max

(d)
1. Don't use shading;
2. Only use single lines / don't use sketching (lines) / ensure lines are continuous / connected;
3. Add further labels / annotations;
4. Don't cross label lines;
5. Add magnification / scale (bar);

Reject 'colour in'.

Reject 'use of electron microscopes'

Ignore 'use a sharp pencil'

2 max

[10]

Q2.

(a) 1. (Simple / facilitated) <u>diffusion</u> from high to low concentration / down <u>concentration gradient</u>;

***Q** Do not allow across / along / with concentration gradient*

2. Small / non-polar / lipid-soluble molecules pass via phospholipids / bilayer;

Reject: named molecule passing through membrane by an incorrect route

Accept: diagrams if annotated

OR

Large / polar / water-soluble molecules go through proteins;

3. <u>Water</u> moves by osmosis / from high water potential to low water potential / from less to more negative water potential;

4. <u>Active transport</u> is movement from low to high concentration / against <u>concentration gradient</u>;

Only penalise <u>once</u> if active transport is not named
e.g. 'movement against the concentration gradient involves proteins and requires ATP' = 2 marks

5. Active transport / <u>facilitated diffusion</u> involves proteins / carriers;

Accept: facilitated diffusion involves channels

Reject: active transport involves channels

6. Active transport requires energy / ATP;

7. Ref. to Na^+ / glucose co-transport;

Credit ref. to endo / exocytosis as an alternative

5 max

(b) 1. Many alveoli / alveoli <u>walls</u> folded provide a large surface area;

Neutral: alveoli provide a large surface area

2. Many capillaries provide a large surface area;

3. (So) fast <u>diffusion</u>;

Neutral: greater / better diffusion
Neutral: fast gas exchange
Allow 'fast <u>diffusion</u>' only <u>once</u>

4. Alveoli or capillary walls / epithelium / lining are thin / short distance between alveoli and blood;

Reject: thin membranes / cell walls
Accept: one cell thick for 'thin'

5. Flattened / squamous epithelium;

Accept: endothelial

6. (So) short <u>diffusion</u> distance / pathway;

7. (So) fast <u>diffusion</u>;

8. Ventilation / circulation;

Accept: descriptions for ventilation / circulation

9. Maintains a diffusion / concentration gradient;

10. (So) fast <u>diffusion</u>;

Do not double penalise if description lacks detail
e.g. thin membranes so a short diffusion distance = 1 mark

5 max

[10]

Q3.

(a) (i) (Simple) diffusion;

Reject facilitated diffusion

Accept lipid diffusion

1

(ii) 1. Thin walls / cells;

1. 'Short diffusion pathway' alone is an explanation not a description

1. Accept squamous epithelia / one cell thick

2. (Total) surface area is large;

2. Ignore references to 'volume ratio'

2

(b) 1. Loss of elasticity / elastic tissue / increase in scar tissue;

1. Accept elastin

2. Less recoil;

2

[5]

Q4.

(a) Cell wall;

Starch (store);

Chloroplast;

Accept: phonetic spelling

2 max

(b) Insoluble;

Reduces / 'stops' water entry / osmosis / does not affect water potential / is osmotically inactive;

Accept: description for first point e.g. 'does not dissolve'.

2

(c) Light sensitive eyespot / eyespot detects light;

Flagellum enables movement towards light;

Chloroplast / chlorophyll absorbs light / for photosynthesis;

Do not penalise references to 'many chloroplasts'.

3

[7]

Q5.

(a) (i) Diffusion;

Ignore references to structures, membrane components etc

Allow simple diffusion

Reject facilitated diffusion

1

(ii) 1. (Thin / flat body) so short distance for diffusion / short diffusion pathway;

Ignore references to membrane, wall, body surface

2. (Thin / flat body so) large surface area to volume ratio;

'It' refers to flatworm's body

2

(b) (i) A group of tissues;

Ignore references to function Group = more than one

1

(ii) 1. (Carbon dioxide enters) via stomata;

Reject stroma

2. (Stomata opened by) guard cells;

3. Diffuses through air spaces;

Allow concentration gradient. Reject along gradient unless direction made clear

4. Down diffusion gradient;

3 max

[7]

Q6.

(a) 1. Lower affinity for oxygen / releases more oxygen / oxygen is released quicker / oxygen dissociates / unloads more readily;

***Q** Neutral: the organism / body has a lower affinity for oxygen / releases more oxygen*

2. (To) muscles / tissues / cells

3. (For) high / rapid respiration;

***Q** Reject: '**produces** more energy' on its own*

Neutral: reference to partial pressure

Accept: (for) respiration to produce more energy in the form of ATP / release more energy

3

(b) (i) 1. Small SA:VOL;

Neutral: small limbs / small ears / extremities

Neutral: small SA

Accept: large VOL:SA

Neutral: reference to fat / blubber / insulation

2. (So) reduces heat loss / (more) heat retained;

Note: MP2 is independent of MP1

2

(ii) 1. Brain is the same, others fall;

Note: 1. might not be given in the same sentence

Assume that 'other organs fall' = all three organ categories fall

Accept: 'blood flow is reduced to all organs except for the brain'

2. Brain controls other organs / remains active / needs constant supply of <u>oxygen</u>;

Accept: 'seal would die' = brain remains active

3. Lungs not used / are used less / seal is not breathing / heart rate decreases / heart pumps less / blood diverted to muscles;

Reject: seal is not respiring

3

[8]

Q7.

FOR

1. (If the husband smokes) there's a greater risk of dying from lung cancer / emphysema / cervical cancer;

2. The more the husband smokes, the greater the risk of dying from lung cancer / emphysema;

3. Suitable use of figures from the table to illustrate answer;

AGAINST

4. Little difference in risk of dying of stomach / heart disease;

5. Other factor (than husband smoking) / named factor might cause death;

6. Only one sample / further studies needed;

4 max

[4]

Q8.

(a) 1. Water and blood flow in opposite directions;

Accept: diagram if clearly annotated

2. Maintains concentration / diffusion gradient / equilibrium not reached / water always next to blood with a lower concentration of oxygen;

Must have the idea of 'maintaining' or 'always' in reference to concentration / diffusion gradient

Accept: constant concentration / diffusion gradient

3. Along whole / length of gill / lamellae;

Accept: gill plate / gill filament

3

(b) 1. (Thicker lamellae so) greater / longer <u>diffusion</u> distance / pathway;

***Q** Neutral: 'thicker' diffusion pathway*

2. (Lamellae fuse so) reduced surface area;

Accept: reduced SA:VOL

2

(c) (i) Correct answer of **5.1** or **5.14(2857)** (dm^3) = 2 marks;;

*Allow 1 mark max for an answer of **5** if the correct answer of **5.1** or **5.14(2857)** is **not** shown*

One mark for incorrect answers that show **36** or **0.4 × 90** or **90 ÷ 7;**

2

(ii) 1. Increased metabolism / respiration / enzyme activity;

Accept: enzymes work more efficiently

2. Less oxygen (dissolved in water);

Neutral: references to increased kinetic energy (of water molecules)

1 max

[8]

Q9.

(a) (Simple) diffusion;

Reject: facilitated diffusion.

1

(b) 1. Thin/small **so** short diffusion pathway;

Reject: thin membrane/wall/cells.

2. Flat/long/small/thin **so** large surface area to volume ratio/surface area : volume;

Accept: small volume to surface area ratio.

2

(c) 1. High/50% saturation (with oxygen) below (pO_2 of) 0.2 kPa;

*Accept: fully saturated **or** above 50% saturation below 0.2kPa.*

Accept: any number between 0.08 and 0.2 kPa

2. (Oxygen) for respiration;

2

(d) 1. Water potential high<u>er</u> in worm
OR
Low<u>er</u> water potential in seawater;

Accept: correct reference to water potential gradient if direction of water movement is given.

Accept: ψ for water potential.

2. Water leaves by <u>osmosis</u> (and worm dies);

Reject: worm/cells burst.

2

[7]

Q10.

(a) 1. Trachea and bronchi and bronchioles;
2. Down pressure gradient;
3. Down diffusion gradient;
4. Across alveolar epithelium.

Capillary wall neutral

5. Across capillary endothelium / epithelium.

4 max

(b) (About) 80.0%.

1

(c) 1. (Group **B** because) breathe out as quickly as healthy / have similar FEV to group **A**;
2. So bronchioles not affected;
3. FVC reduced / total volume breathed out reduced.

*Allow this marking point for group **C***

3

[8]

Q11.

(a) 1. Contraction of internal intercostal muscles;
2. Relaxation of diaphragm muscles / of external intercostal muscles;
3. Causes decrease in volume of chest / thoracic cavity;
4. Air pushed down pressure gradient.

4

(b) 19(%);

1

(c) 1. Muscle walls of bronchi / bronchioles contract;
2. Walls of bronchi / bronchioles secrete more mucus;
3. Diameter of airways reduced;
4. (Therefore) flow of air reduced.

4

[9]

Q12.

(a) Muscles (associated with breathing) relax;

1

(b) Produces lower pressure (and air moves in down pressure gradient);

1

[2]

Q13.

(a) (Small alveoli with) large surface area;
For diffusion;

2

(b) (i) Epithelium / epithelial / squamous / pavement cells;
Reject endothelium.

1

(ii) 0.11 μm;

1

(c) (i) Less oxygen / more carbon dioxide / more water vapour;
Two differences required, but only one mark for this part of the question.

1

(ii) Gas exchange takes place in alveoli / does not take place in trachea;

1

(d) (i) Pulmonary artery;

1

(ii) Concentrations reach equilibrium / become equal;
Diffusion occurs when there is a concentration gradient (so some will remain in blood);
OR
Lung cells / vessel cells respire;
Add / produce carbon dioxide;

2

[9]

Q14.

(a) (i) Through alveolar <u>epithelium</u>;

Through capillary <u>epithelium / endothelium</u>;

Accept: Through lining / wall of alveolus <u>and</u> capillary for 1 mark

Accept: squamous epithelial cells for 'epithelium'
Neutral: alveolar endothelium
Neutral: references to diffusion

***Q** Correct use of terminology;*

2

(ii) (Thicker alveolar wall) – no mark

Neutral: less diffusion

(So) Longer <u>diffusion</u> pathway / slower <u>diffusion</u>;

Neutral: references to surface area

1

(b) (i) (In alveolus)

Need the idea of air moving and oxygen concentration

Brings in air containing a high(er) oxygen concentration;

Neutral: reference to carbon dioxide concentration

Removes air with a low(er) oxygen concentration;

2

(ii) Circulation of blood / moving blood;

Neutral: blood Neutral: short diffusion pathway

1

(c) Long time between decrease in mining and increase in cases;

Graph shows fluctuations;

Correlation does not prove causation / there may be other causes of miner's

lung;

Improved diagnosis methods;

Do not know number of cases / baseline before 1990;

Not all cases reported / not all individuals with miner's lung visit a doctor;

Accept: correct use of figures from graph for the first marking point: e.g. cases do not increase until after 2000 / 2001-2004 / 10 years later.

2 max

[8]

Q15.

(a) Epithelium of alveolus, capillary wall / epithelium / endothelium, plasma;

1

(b) Cell wall;
Capsule;
Flagellum;
Mesosomes;
Plasmid;
Genetic material / DNA / nucleoid;
Ribosomes;

Accept references to size only if some idea of range is given

max 2

(c) Large (surface) area;
For diffusion;
or
Short distance to centre of cell / to all haemoglobin;
For diffusion;

2

(d) (i) Correct answer of approximately 7800 / 8000 = 2 marks
Incorrect answer but clearly derived by
dividing diameter of cell A by 7 = 1 mark

2

(ii) Idea of cut through maximum diameter / middle;

1

[8]

Q16.

(a) (i) one feature;
then linked Explanation;

(many) filaments / lamellae / secondary lamellae;
so large surface area;

large number of capillaries; (NOT "good blood supply")
maintains a diffusion gradient / removes oxygen;

thin epithelium / lamellae wall;
short diffusion pathway;

2

(ii) maintains diffusion / concentration gradient / equilibrium

not reached;
diffusion occurs across whole length (of lamellae / gill);

2

(b) less energy needed / continuous flow of water or O_2;

1

[5]

Q17.

(a) 1. Large surface area provided by lamellae / filaments increases diffusion / makes diffusion efficient;;

Q *Candidates are required to refer to lamellae or filaments. Do not penalise for confusion between two*

2. Thin epithelium / distance between water and blood;

3. Water and blood flow in opposite directions / countercurrent;

4. (Point 4) maintains concentration gradient (along gill) / equilibrium not reached / as water always next to blood with lower concentration of oxygen;

5. Circulation replaces blood saturated with oxygen;

6. Ventilation replaces water (as oxygen removed);

6

(b) Mixing of air and water (at surface);

Air has higher concentration of oxygen than water;

Diffusion into water;

Plants / seaweeds near surface / in light;

Produce oxygen by photosynthesis;

2 max

(c) Not much oxygen near sea bed;

Toadfish haemoglobin (nearly) saturated / loads readily at / has higher affinity for oxygen at low <u>partial pressure</u> (of oxygen);

2

(d) The chimpanzee and the bonobo are more closely related (than to the gorilla);

They have identical amino acids / one of the amino acids is different in the gorilla;

2

[12]

Q18.

(a) Large surface area to volume ratio;
For diffusion;
OR
Flat / thin;
So oxygen can reach all haemoglobin / centre rapidly / short pathway;

max 2

(b) (i) Partially permeable / allows water through but not sucrose;
Accept semi-permeable / selectively permeable.

1

(ii) Phospholipid (in membrane) / bilayer dissolved / broken down;
Allows haemoglobin / contents to leak out;

2

[5]

Q19.

(a) exchange / diffusion across body surface / skin;
short <u>diffusion</u> pathway / distance / large SA:V ratio;

2

(b) large numbers of lamellae so large SA;
lamellae thin so short (diffusion) pathway to blood / capillaries;
high rate of oxygen uptake for respiration / energy release;
(accept more oxygen)

3

[5]

Q20.

(a) transmission / reflected / misses chlorophyll / chloroplasts / wrong wavelength;

1

(b) (larger area) to absorb light;
(larger surface area) to absorb carbon dioxide;
short diffusion pathway for gases / oxygen / CO_2;
light able to penetrate to all cells;

2 max

(c) effect;
detail;
effect on photosynthesis;
some effects are less light / light absorbed by water
different wavelength of light
temperature
availability of carbon dioxide
availability of water
(more than one effect award 1 mark only)

3

[6]

Q21.

(a) 1. mouth opens, operculum / opercular valve shuts;
2. floor of mouth lowered;
3. water enters due to decreased pressure / increased volume;
4. mouth closes, operculum / opercular valve opens;
5. floor raised results in increased pressure / decreased volume;
6. high / increased pressure forces / pushes water over gills;

4 max

(b) 1. alveoli provide a large surface area;
2. walls of alveoli <u>thin</u> to provide a short diffusion pathway;
3. walls of capillary <u>thin</u> / close to alveoli provides
a short diffusion pathway;

4. walls (of capillaries / alveoli) have flattened cells;
5. cell membrane permeable to gases;
6. many blood capillaries provide a large surface area;
7. intercostal / chest muscles / diaphragm muscles / to ventilate lungs / maintain a diffusion / concentration gradient;
8. wide trachea / branching of bronchi / bronchioles for efficient flow of air;
9. cartilage rings keep airways open;
(*reject moist and thin membranes*)

6 max

[10]

Q22.

(a) 1. (Overall) outward pressure of 3.2 kPa;
2. Forces small molecules out of capillary.

2

(b) Loss of water / loss of fluid / friction (against capillary lining).

1

(c) 1. High blood pressure = high hydrostatic pressure;
2. Increases outward pressure from (arterial) end of capillary / reduces inward pressure at (venule) end of capillary;
3. (So) more tissue fluid formed / less tissue fluid is reabsorbed.

Allow lymph system not able to drain tissues fast enough

3

(d) 1. Water has left the capillary;
2. Proteins (in blood) too large to leave capillary;
3. Increasing / giving higher concentration of blood proteins (and thus wp).

3

[9]

Q23.

(a) shallow roots enable rapid uptake of rainfall (in **X** and / or **Z**);
widespread / shallow roots allow collection of larger volume water / over a larger area / rapid uptake of water (in **Z**);
swollen stem for water storage (in **X**);
deep roots for accessing deep groundwater (in **Y**);
small / no leaves so little transpiration;

3

(b) **Z**;
wide spread of roots for rapid water absorption;
(accept **X**; if linked to leaves channelling water to roots)
(ignore references to water storage abilities)
(accept other responses if justified)

2

[5]

Q24.

(i) (waxy so) impermeable to water / waterproof / stops water passing through;

1

(ii) reference to hairs / position of stomata (sunken stomata / stomata in pits)

LINKED to reduced air movement / trap layer of air /
trap water vapour (*reject water) /* maintains humidity;

reduces diffusion gradient / concentration gradient of water /
water potential gradient;

OR

stoma can close;
reduces area for evaporation or transpiration;

2

[3]

Q25.

(a) (gills have) lamellae on filaments;
lots of both;

2

(b) (i) all 3 go up;

Accept converse

1

(ii) more oxygen can be supplied;
for more respiration;

Accept answer relating to CO_2

2

[5]

Q26.

(a) Lengthways / down the root;

Through one tissue only / through same part / same proportion of tissues;

2

(b) To prevent the water from evaporating / prevent evaporation;

Changing the concentrations / water potential (of solution);

2

(c) (i) Plot data on a graph;

Find (sucrose concentration) from the graph where the ratio is 1;

2

(ii) No, because the results are given as a ratio / as a proportion of initial length;

1

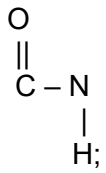
[7]

Q27.

(a) Rate of movement / diffusion proportional to concentration gradient / difference in concentration;
High concentration of potassium ions inside cell compared to outside;
Must mention high concentration. Ignore reference to other factors if reasoning is appropriate.

2

(b) (i)



1

(ii) 10;

1

(c) Action of vanilomycin depends on fluidity of membrane;
Fluidity reduced / not fluid at low temperatures;
Pore formed by gramicidin A remains in place / permanent;

3

(d) Pore between sterol molecules lined with polyene antibiotic;
Hydrophobic region next to sterol;

2

[9]

Q28.

(a) Phagocytes engulf / ingest pathogens / microorganisms / bacteria / viruses;

Phagocytes destroy pathogens / microorganisms / bacteria / viruses;

Lung diseases are caused by pathogens / microorganisms / bacteria / viruses;

Q *Allow description of process of engulfing*

2 max

(b) (i) Alveoli / lungs will not inflate / deflate fully / reduced lung capacity;

Breathing out particularly affected / no longer passive;

2

(ii) Alveolar walls thicken;

Longer diffusion pathway;

Scarred / fibrous tissue;

Reduces surface area (for gaseous exchange);

Q *Diffusion is essential for 2nd point and surface area for 4th point.*

4

(c) (i) Cancer develops 20 – 30 years after exposure (to asbestos);

1

(ii) Smoking / air pollution / specified industrial source;

1

[10]

Q29.

(a) Filaments / lamellae provide large surface area;

Thin / flattened epithelium / one / two cell layers so short diffusion pathway (between water and blood);

Countercurrent / blood flow maintains concentration / diffusion gradient;

Q *Do not credit thin cell walls / membranes*

2 max

(b) (i) Large / wide range of values (so can fit on graph);

1

(ii) Decrease in uptake with increase in mass / negative correlation;

1

(iii) Enables comparison;

As animals differ in size / mass;

2

[6]

Q30.

(a) 1. Water potential becomes lower / becomes more negative (as sugar enters phloem);
2. Water enters phloem by osmosis;
3. Increased volume (of water) causes increased pressure.

3

(b) 1. Rate of photosynthesis related to rate of sucrose production;
2. Rate of translocation higher when sucrose concentration is higher.

2

(c) 1. Rate of translocation does not fall to zero / translocation still occurs after 120 minutes;

2. But sucrose no longer able to enter cytoplasm of phloem cells.

2

[7]

Q31.

General principles for marking the Essay:

Four skill areas will be marked: scientific content, breadth of knowledge, relevance and quality of language. The following descriptors will form a basis for marking.

Scientific content (maximum 16 marks)

Category	Mark	Descriptor
	16	
Good	14	Most of the material of a high standard reflecting a comprehensive understanding of the principles involved and a knowledge of factual detail fully in keeping with a programme of A-level study. Some material, however, may be a little superficial. Material is accurate and free from fundamental errors but there may be minor errors which detract from the overall accuracy.
	12	
	10	
Average	8	A significant amount of the content is of an appropriate depth, reflecting the depth of treatment expected from a programme of A-level study. Generally accurate with few, if any fundamental errors. Shows a sound understanding of most of the principles involved.

	6	
	4	
Poor	2	Material presented is largely superficial and fails to reflect the depth of treatment expected from a programme of A-level study. If greater depth of knowledge is demonstrated, then there are many fundamental errors.
	0	

Topics
3.1.7 Water
3.2.3 Transport across cell membranes
3.3.1 Surface area to volume ratio
3.3.2 Gas exchange
3.3.3 Digestion and absorption
3.3.4 Mass transport
3.5.3 Energy and ecosystems
3.5.4 Nutrient cycles
3.6.4 Homeostasis is the maintenance of a stable internal environment

Breadth of Knowledge (maximum 3 marks)

Mark	Descriptor
3	A balanced account making reference to most if not all areas that might realistically be covered on an A-level course of study.
2	A number of aspects covered but a lack of balance. Some topics essential to an understanding at this level not covered.
1	Unbalanced account with all or almost all material based on a single aspect
0	Material entirely irrelevant.

Relevance (maximum 3 marks)

Mark	Descriptor
3	All material presented is clearly relevant to the title. Allowance should be made for judicious use of introductory material
2	Material generally selected in support of title but some of the main content of the essay is of only marginal relevance.
1	Some attempt made to relate material to the title but considerable amounts largely irrelevant.
0	Material entirely irrelevant or too limited in quantity to judge.

Quality of language (maximum 3 marks)

Mark	Descriptor
3	Material is logically presented in clear, scientific English. Technical terminology has been used effectively and accurately throughout.
2	Account is logical and generally presented in clear, scientific English. Technical terminology has been used effectively and is usually accurate.
1	The essay is generally poorly constructed and often fails to use an appropriate scientific style and terminology to express ideas.
0	Material entirely irrelevant or too limited in quantity to judge.

[25]

Additional notes on marking this question

Care must be taken in using these notes. It is important to appreciate that the only criteria

to be used in awarding marks to a particular essay are those corresponding to the appropriate descriptors. Candidates may gain credit for any information providing that it is biologically accurate, relevant and of a depth in keeping with an A-level course of study. Material used in the essay does not have to be taken from the specification, although it is likely that it will be.
These notes must therefore be seen merely as guidelines providing an indication of areas of the specification from which suitable factual material might be drawn.

In determining the mark awarded for breadth, content should ideally come from each of the areas specified if maximum credit is to be awarded. Where the content is drawn from two areas, two marks should be awarded and where it is taken only from a single area, one mark should be awarded. However, this should only serve as a guide. This list is not exhaustive and examiners should be prepared to offer credit for the incorporation of relevant material from other areas of study.