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Unofficial Mark Scheme

F211, AS Biology
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OCR

This mark scheme only deduce how the paper could be marked according to previous ones

Question 1.

a.)

i.) **[2 marks]**

A – nucleus

B – chloroplast

ALLOW nuclear envelope

IGNORE nucleolus

ii.) **[2 marks]**

C – production of energy in form of ATP; site of aerobic respiration

D – synthesis of lipids/named lipids

IGNORE ref. to name of both structures

ALLOW 'production' if all lipids stated

b.) **[max. 2 marks]**

resolution of light microscope too low;

resolution of 0.1µm only;

definition of resolution;

different parts of organelles could not be distinguished from each other

ALLOW ref. to ultrastructure

IGNORE ref. to seeing

c.) **[max. 2 marks]**

In this question, first mark is for seeing, second mark for recognising/distinguishing.

many components of cells are colourless;

staining allows to see different cell components;

staining allows to distinguish/recognise particular cell contents

Question II.

a.)

i.) [2 marks]

Correct answer = 2 marks

0.6 :1

ALLOW 0.6 to 1

Note: If answer is not correct, then ALLOW one mark for correct division 600/1000

ii.) [2 marks]

the higher the surface area to volume ratio, the greater the rate of diffusion / SA:V ratio proportional to diffusion rate;

ALLOW SA:V ratio

DO NOT MARK incorrect numbers

example from table

iii.) [max. 2 marks]

(even) large plants have relatively high surface area to volume ratio;

ALLOW SA:V ratio

they do not need any (specialised) exchange surfaces; as they are metabolically less active

b.)

i.) [1 mark]

length of side of cube divided by time take for pink colour to disappear

ALLOW equation

ii.) [1 mark]

it is twice diffusion rate / should be divided by two

c.) [4 marks]

idea of short diffusion distance/e.g. only one cell thick

idea of increased surface area to volume ratio for diffusion

idea of CO₂ concentration being always high and O₂ always low within capillaries

ALLOW steep diffusion gradient

idea of CO₂ concentration being always low and O₂ always high within alveoli

ALLOW steep diffusion gradient if not stated above

Question III.

a.)

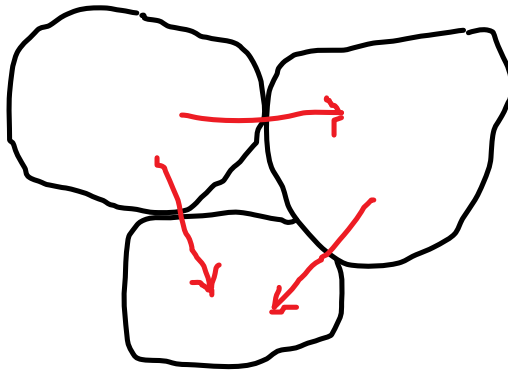
i.) [1 marks]

mitosis

ii.) [2 marks]

First mark for drawing four chromosomes, second mark for drawing two sister chromatids on each chromosome.

iii.)



First mark for arrows from cell R (both of them), second mark for an arrow from cell S.

b.) [2 marks]

meristem cells in cambium can divide by mitosis;
large amount of sucrose giving energy for growth
just under the bark

IGNORE ref. to meristem cells
being unspecialised

c.) [1 mark]

endodermis (in root)

d.) [max. 2 mark]

In this question, first mark is for plants, second mark is for animals.

(even) large plants do not have any (specialised) exchange surfaces as their surface area to volume ratio is high enough/sufficient;

lenticels absorb gases such as carbon dioxide needed for photosynthesis

multicellular animals do have exchange surfaces as their surface area to volume ratio is too low to meet their needs

Question IV.

a.)

i.) [max. 3 marks]

fetus is not exposed to air so in order to get oxygen, it needs to be able to get it from mother's blood; mother's haemoglobin releases oxygen at low oxygen tension/partial oxygen pressure whereas fetal haemoglobin is able to pick it up even at low oxygen tension/partial oxygen pressure; oxygen tension in placenta is low; fetal haemoglobin has higher affinity for oxygen; fetal haemoglobin picks up oxygen at low placental pressure so the curve shifts to the left

ALLOW pO_2

ALLOW attraction

ii.) [max. 2 marks]

fetal haemoglobin is able to pick up oxygen even at low oxygen tensions; replacing adult haemoglobin by fetal haemoglobin would cause haemoglobin not to crystallise at such pressures; so the red blood cells would not change their shape so the transport of oxygen would not be disrupted

ALLOW pO_2

ALLOW erythrocytes

b.) [max. 3 + 1 marks]

(at arteriole end of a capillary bed,) hydrostatic pressure is relatively high; capillaries have (tiny) pores through which small substances may pass through at such pressure; this causes small substances leave the capillary and form tissue fluid; examples of substances within tissue fluid

DO NOT MARK examples of substances within tissue fluid already stated in above instructions for the question

QWC: two from: hydrostatic pressure, capillary bed, arteriole, venule

Question V.

a.) **[max. 2 marks]**

idea of holding metabolic processes in place

idea of separating cell contents from cytoplasm

idea of separating cell contents from each other

any other relevant references

b.) **[max. 4 + 1 marks]**

varies according to personal choice

c.)

i.) **[1 mark]**

phospholipid bilayer

ALLOW phospholipids

ii.) **[max. 1 mark]**

proteins;

glycoproteins

iii.) **[max. 2 marks]**

idea of denaturation of proteins within cell plasma

membranes of liver cells;

idea of more oxygen being released from those cells

when placed in solution of 2% hydrogen peroxide

Question VI.

a.) [3 marks]

water loss from aerial/upper parts of plants;
due to evaporation and diffusion out of leaves;
definition of transpiration stream as:
force/tension created due to water lost from
aerial/upper parts of plants;

ALLOW ref. to hydrostatic
pressure

IGNORE ref. to adhesion

IGNORE ref. to cohesion

b.) [3 marks]

F;

G;

K

c.) [4 marks]

xylem	phloem
mineral ions (ALLOW minerals)	sucrose
no cross-walls / no ends between cells	---
lignin	---
pits	plasmodesmata

I hope this mark scheme will help you.

In case of any questions, please, feel free to contact me:

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