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A2 Biology OCR

Unit F215: Control, genomes and environment

Module 2.1 Cloning in plants and animals

Answers

5.2.1

1

stated advantage;

detail; e.g. *particular character (not whole phenotype)/can alter one trait only (without affecting background genes)/can add allele from different taxon with which breeding may not be possible/quicker (than the many generations of, selective breeding/backcrossing)*

2

stated disadvantage;

detail; e.g. *cannot precisely position insert (so) unknown/unanticipated effect/may pass to other species (with unknown/undesirable, effect)/regarded as ethically undesirable (no market/crop destroyed by protesters)/cannot breed from GM (requires cloning)*

2
[4]

2

(i) **R questions**

embryo, potential human/member of society/right to life/killed/AW;
may be from abortion;
scientist making decision for use of embryo/consent may not be required;
parents may not know fate;
religious objection;
may involve cloning;
some stem cells can be obtained instead from umbilical cord;
AVP;

1 max

(ii) treat/cure for, anaemia/sickle cell anaemia/named blood disease;
blood, for transfusion/to replace loss;
treat, immune disorders/SCID/lupus;
treat, non-Hodgkins lymphoma/some types of cancer/leukaemia;
treat/cure for, Alzheimer's disease;
treat/cure for, Parkinson's disease;
treat paraplegics/repair injury to, nerves/spinal cord;
treat, genetic disorders affecting nerves/Huntington's/Tay Sachs/Lou Gehrig's;
treat multiple sclerosis/motor neurone disease;
AVP; eg. stroke/brain damage/retinal repair
AVP; *must be relevant to use of blood cells or neurones*

2 max
[3]

3

meristematic/pluripotent/totipotent/cambial/undifferentiated, tissue;
sterile conditions;
nutrient medium to encourage, division/mitosis;
produces callus;
subdivided;
different (nutrient) medium to encourage differentiation;
detail of either medium; e.g. *named nutrient or plant growth substance*
grows to plantlet;
hardening medium/sterile soil;

max 5
[5]

5.2.1

4

- (a) (i) produced by asexual reproduction ;
one parent / no gamete formation ;
genetically identical (to parent) ;
produced by mitosis ; 2 max
- (ii) keeps, desirable characteristics / high productivity / AW ;
quicker / no germination time ;
stronger / more likely to survive ;
mass production / more produced ;
disease free ; 2 max
- (iii) induce seedless fruit ;
increase fruit size ;
improve fruit set ;
avoid need for pollination ;
AVP ; e.g. weedkiller / inhibits sprouting in potatoes / prevents
premature fruit drop 2 max
- (iv) large surface area ;
absorbs water ;
by osmosis / down a water potential gradient ;
ions / named ion(s) ;
ions pass through cell surface membrane ;
protein, channels / carriers ;
active transport ;
help to prepare cuttings for transplanting to soil / AW ;
AVP ; 4 max
- (b) sucrose ;
amino acids ;
vitamins ;
ions / named ions ;
auxins ;
cytokinins ;
water ;
agar ; 3 max
- (c) labour intensive ;
sterile conditions ;
special equipment ;
trained staff ;
electricity / power, costs ;
quality control of process ;
AVP ; e.g. set up costs 3 max
- (d) grafting / budding / described ;
layering / described ; 1 max
- [17]**