



BIOLOGY

6884/02

Paper 2 Structured Questions


October/November 2018

Confidential

MARK SCHEME

{6884/02}

MARKS: 80

- 1 (a) flagellum; sterile capsule;
circular / coiled / single chromosome / DNA / plasmids;
enucleate / no nucleus / nucleoid / no nuclear membrane prokaryotic
 [max. 2]
- (b) small / light spores + reproduction / to withstand harsh conditions/for dispersal by air currents;
mycelia / hyphae rhizoids (branching) + (large surface area) / obtain for absorption of food materials; / feeding hyphae
sporangium held away from the substrate + better spore dispersal
sporangium bursts + to assist in spore dispersal / to expel spores into the air; [max. 2]
- (c) (i) (optimum) temperature;
(optimum) pH; [2]
(ii) AW to exclude other microorganisms;
avoid contamination which will interfere with product / produce unwanted substances / unwanted reactions / compete with fungus for nutrients / oxygen; [2]
- (d) piece of human insulin gene DNA cut using enzyme;
plasmid cut;
DNA inserted into plasmid;
plasmid returned to bacterial cell;
bacteria cultured in a fermenter;
insulin secreted by bacterial cells; [max. 5]
- 2 (a) (i) mouth / buccal cavity; [1]
(ii) description- concentration decreases; [1]
explanation - fats digested (by lipase);
to fatty acids and glycerol;
in presence of bile salts / which emulsify them; [max. 2]
- (b) **feature** - epithelium is (very) thin; / 1 cell thick / thin walled
explanation- to allow easy diffusion / passing on nutrients; / digested
feature- (network of) blood capillaries;
explanation -which ® diffusion absorb and transport glucose and amino acids / nutrients / digested food

feature - lacteals;

explanation- ® diffusion absorption of fats / fatty acids / glycerol;

feature – transport microvilli / mitochondria

explanation- increase surface area; / high respiration for more active transport [max. 4]

- (c)** (excess) amino acids broken down; / converted
nitrogen containing part removed; / amino group
to form urea (which is excreted);
remainder converted to carbohydrate / fats / releases energy;

[max. 3]

- 3 (a) (i)** oxygen; [1]
(ii) increased light intensity;
resulting in increased photosynthesis; [2]
(iii) presence of limiting factor light intensity not a limiting factor;
temperature / carbon dioxide (is limiting factor);
restricts the effect of increasing light intensity; [max. 2]

- (b)** overgrowth of water plants / algal bloom;
blockage of sunlight;
plants below die / algae dies; / no photosynthesis
aerobic bacteria decompose dead organisms;
oxygen depletion;
aquatic organisms die / suffocate / cannot respire;
eutrophication; [max. 5]

- 4 (a) (i)** internal diameter smaller / narrower;
(ii) thickness of muscle layer – thicker; [2]
- (b)** left ventricle has more oxygen than right ventricle;
left ventricle has less carbon dioxide than right ventricle; [2]
- (c)** no / less oxygen / glucose to heart muscle; / less blood flow
no / less respiration;
less / no energy for contraction; [3]

- (d) (i) platelets;
fibrinogen;
converted to fibrin; [3]
- (ii) transport blood proteins;
Nutrients / named; / glucose / amino acids
distribute heat;
transports antibodies hormones / blood cells; / drugs
transports waste material / urea / carbon dioxide; [max. 2]
- 5 (a) (i) cells joined end to end / form long narrow tubes; / tubular / no end walls
hollow / xylem vessels consist of dead cells; no cell contents/ A named cell
contents e.g. nuclei hollow *lumen*; (any two) have pits [max. 2]
- (ii) active transport;
Energy (from respiration) needed for the process; [2]
- (b) loss of water vapour through the stomata / (in leaves) / transpiration +
sets a suction force / pull / pressure;
ref. to water potential gradient in xylem;
(this force) draws water up the xylem;
ref to cohesion / adhesion forces;
capillarity; [max 4]
- (c) translocated;
in the phloem;
as sucrose; / [3]
- (d) 1. thorny; / spiky / skiny
for protection / minimise water loss through transpiration;
2. thick / succulent / fleshy;
to store water; [max. 4]
- 6 (a) (i) vegetative propagation / reproduction;
stem produces roots at (inter) nodes;
bud (grows) (at internode);
develops into new plant; [max. 3]
- (ii) one parent is involved; no gametes / no fertilisation
preservation of good genes / traits; / adaptation to parents' favourable
environment [max. 2]

(b) lining breaks down; / degenerates / disintegrate I menstruation
due to a decrease in progesterone;
that maintains the uterus lining; [3]

(c) secretes progesterone /oestrogen;
barrier for harmful pathogens;
prevents mixing of maternal and foetal blood; [2]

(d) (drugs contain) FSH + for follicle development; eggs / ova development / maturation
of ova
LH + for ovulation;
progesterone + maintain uterus lining;
drugs that suppresses secretion of oestrogen + so more FSH is released; [3]

7 (a) parental genotypes – $H^N H^n$;
gametes – H^N H^n H^N H^n ; all four correct
offspring genotypes – $H^N H^n$ $H^N H^n$ $H^N H^N$; all three correct
offspring phenotypes – one sickle cell, two sickle cell trait; 1 normal haemoglobin; [4]

(b) codominant alleles /
infected red blood cells become sickle shaped;
plasmodium / probozan
kill parasite / parasite cannot reproduce / parasite cannot invade sickle shaped red
blood cells; [max. 2]