HKCEE 只限教師參閱 FOR TEACHERS' USE ONLY 2001 Bio

2001 CE Biology Paper 1 Marking Scheme Marks

1.(a) (i) (1) Bubbling air into the sewage facilitates the aerobic respiration of microorganisms (anaerobic) (bacteria ✓) in the sewage (<+/−>) 1
This stimulates the growth / metabolic activities of the microorganisms 1
thus promoting the decomposition of organic substances in the sewage 1
Effective communication (C) (<sewage / effluent ✗>) 1

(2) It can save the valuable water resource / (recycle) the water resource (nutrient other plant needed)
It can prevent the contamination of the river with excessive amount of minerals (pollute)
It can recycle the nutrients / reduce the demand of inorganic fertilizers (such as fish) any two .. 1,1
makes use of the effluent as a source of nutrient supply for the crop growth)
It can prevent algal blooming in the river due to the discharge of the effluent)

(ii) (pathogen) (Vertebrate) (rat bites ✓) Pest population may increase / Diseases may spread rapidly among the crop 1
Certain minerals in the soil may become exhausted rapidly 1

(iii) Soil erosion may occur in the mountains (landslides during heavy rainfall) 1
This leads to the deposition of silt in the reservoir / a reduction in the water storage capacity of the reservoir (↓ water collection) 1
thus reducing the water supply to the town 1
or
Soil erosion may occur in the mountains ..... 1 any
Water in the reservoir may carry a lot of suspended particles / soil minerals ..... 1 one
The water quality may become poor ..... 1 set
or
Surface run-off of water increases 1
Less water is gathered in the reservoir 1
thus reducing the water supply to the town 1

Total : 10 + *1* marks

1.(b) (i) Proteins are present in the blood plasma but not in the fluid in the nephron 1
because proteins are too large to pass through the wall of the glomerulus / Bowman's capsule (capillaries) 1

(ii) The reabsorption of water from the fluid as it passes along the collecting duct (<absorption of water + location>) 1

(iii) (1) glucose / amino acids (sugars ✓ blood sugars) 1
(2) The concentration of substance X drops to zero along the nephron 1
because X is reabsorbed from the fluid into the capillaries (absorbed ✓ from) 1
by active transport (diffusion) (diffusion ex. active transport ✗) 1

(iv) The amount of urea excreted would increase 1
because beans contain a lot of protein 1
which is digested into amino acids / is absorbed in the form of amino acids 1
Excess amino acids are broken down in the liver forming urea 1
thus an increased amount of urea will be excreted (<deaminated into urea ✗>)

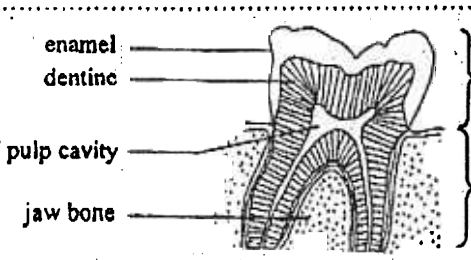
Effective communication (C) 1

∵ deamination Not form urea directly.

Total : 11 + *1* marks

1.(c) (i) (1) C ..... ½ } 2
(2) A, B, D (左右相反亦可) (-½) ..... ½, ½, ½ }

(ii) Drawing (D) : (resemblance, large & clear drawing) (Carnivore) (D=0) ..... 1, ½, 0
Labels (L) : * enamel, dentine, pulp / pulp cavity, jaw bone, root, crown (any five) 2½
Title (T) ..... ½



(rock ✗ gum ✗ capillary ✗ nerves, cement ✗)

Structure of the (molar) (the) (a tooth ✗)

(front ✗ ✗ ✗ ✗)

(iii) Food could not be ground or crushed into small pieces / there would be less mechanical digestion 1
The surface area for the action of digestive enzymes would not be large enough 1
It would take longer time for the food to be broken down into simple soluble forms (no digestion ✗) 1
Total : 9 marks
(difficult to swallow ✗)

✓ physical / chemical digestion
✓ indigestion / incomplete digestion

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Marks

2.(a) (i) To supply nutrients / oxygen to the eyeball ... <F> ... [1+ 1] any one set
as it is richly supplied with blood / capillaries ... <S> ...

or

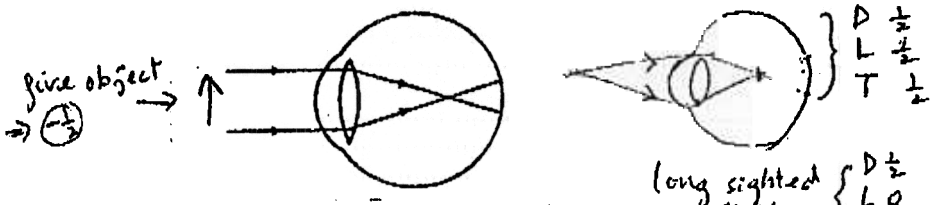
To prevent reflection of light within the eye ... (multiple images ✓) ... [1+ 1] any one set
as it contains dark pigments ... <i.e. black> ... (dull ✓)

(ii) The image formed on C can be seen, while that formed on B cannot be seen ... 1
because there are light-sensitive cells at C, but none at B ... 1

(iii) Structure D would become thinner / less convex ... <thinner> ... 1
This is caused by the relaxation of the ciliary muscle ... <relax> ... 1
which leads to an increase in tension in the suspensory ligaments ... 1
and, in turn, stretches the lens

Effective communication (C)	*1*

(iv) Drawing (D) : large, clear and accurate diagram ... 1
(accuracy includes outline of eyeball, lens of eye, straight lines for light rays)
(L) : Parallel rays from object (with arrow sign), focus in front of retina, rays extended to retina .. 3 x ½
Title (T) ... ½



Ray diagram showing light rays entering a short-sighted eye

Total : 10 + *1* marks

2.(b) (i) Under bright light condition, the rate of photosynthesis of the plant becomes greater than (water level adjust x.
the rate of respiration ... 1
Thus there is a net production of oxygen by the plant ... 1
Meanwhile, the carbon dioxide level inside the syringe remains constant ... 1
This results in an increase in air pressure inside the syringe ... 1

Effective communication (C)	*1*

(ii) (1) Net rate of oxygen produced by the plant = 0.009 $cm^3 O_2 min^{-1}$ ... 1
Rate of photosynthesis of the plant when the lamp was 12 cm from it
= (0.009 + 0.002) $cm^3 O_2 min^{-1}$ = 0.011 $cm^3 O_2 min^{-1}$ ... 1

(2) The rate of photosynthesis decreased ... <Eqn 7.1> ... 1
because the light intensity decreased as the distance between the plant and the lamp increased . 1

Remove the sodium hydrogencarbonate solution ... <mark 1st 3> ... 1
Put a vial of soda lime / sodium hydroxide solution into the syringe ... 1
Wrap the syringe with black paper / aluminium foil ... 1
replace $NaHCO_3$ with NaOH ⇒ 2 >

Total : 11 + *1* marks

2.(c) (i) To inhibit the growth of microorganisms ... <prevent> ... 1

(ii) (1) Wear gloves when handling the seafood / use a clean knife to cut the seafood ... 1
(2) Display the sashimi at low temperature / cover the sashimi during display
/ sashimi must be sold within a short time ... 1
(accept other correct answers)

(1) In the canning process, seafood is subject to high temperature treatment, ... [1+ 1]
which kills the microorganisms present ...

There is no oxygen in the cans ... [1+ 1] any two sets
and this will inhibit the growth of microorganisms ...

The cans are sealed ... [1+ 1]
so that further contamination of the food is prevented ...

(2) *Advantage* : seafood in cans is more conveniently handled / transported
/ can be stored for a long time ... 1
Disadvantage : canning may cause seafood to lose its original flavour / taste / texture ... 1

Total : 9 marks

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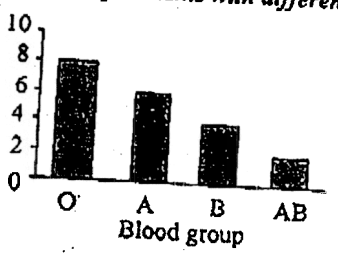
Marks

3.(a) (i) (1) Title (T) ..... ½
Correct labelling of axis (L) ..... ½
Correct plotting of the bars (P): 2 bars correct, ½ mark; 3 bars, 1 mark; all 4 bars, 1½ mark .. 1½

No mark if data are not presented in the form of bar chart.

pie chart × (T=0)

Distribution of students with different blood groups



→ Bars separated / not separated ✓
→ Write on Ans book ✓ (accuracy)
→ X axis (blood group) both vertical / horizontal ✓
T = ½ given only when

(2) Discontinuous variation 1

(ii) ✓ The parents of students 1 and 2 are tongue-rollers, so each of them must carry at least one allele for tongue rolling 1
✓ Student 2 is a non-roller, so she must have received at least one allele for non-tongue rolling from either of her parents 1
✓ Thus at least one of the parents is heterozygous 1
In a hetcrozygous condition, only the dominant allele is expressed 1
Thus the allele for tongue rolling is dominant 1

(iii) They are non-identical twins 1
because their blood groups are different, implying that they are genetically different 1

Total : 11 marks

3.(b) (i) The barbecued pork contains fat .....
The digested products are absorbed into the lacteal in the form of fat / oil droplets .....
As a result, there will be numerous fat / oil droplets in the lymph in X .....

Effective communication (C) 1

(ii) Contraction of skeletal muscles around vessel Y forces the lymph to flow upward .....
The valves in vessel Y help to prevent the backflow of the lymph 1
As the lymph vessels are blocked, tissue fluid in the leg cannot be transported away 1
Meanwhile it is continuously formed in the leg 1
thus tissue fluid accumulates
The pathogen that causes sore throat .....
stimulates the proliferation of lymphocytes / white blood cells in structure Z 1
thus structure Z becomes enlarged 1

Total: 9 + 1 marks

3.(c) (i) (1) *xylem .....

(2)

Structural feature	Adaptation
The xylem vessels in X have no cell content / no end walls / large lumen	This allows a free flow of water inside ..... 1+
The xylem vessels in X have thick cell wall	This can prevent the collapse of the xylem vessels

any one set

(ii) Region R 1

(iii) (1) The support of the stem of plant B is mainly due to the turgidity of cells in region S / thin-wall cells 1
Under a hot and sunny condition,
the rate of transpiration of the plant becomes greater than the rate of water absorption 1
The cells in region S lose water 1
and hence lose their turgidity/become flaccid 1
and thus causing the bending of the stem 1

Effective communication (C) 1

(2) The support of the stem of plant A is due to the presence of xylem / independent of the water content of the plant 1
because the xylem contains thick-wall cells 1

Total : 10 + 1 marks

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4.(a) (i) (1) During exercise, a large amount of heat was generated / Heat was absorbed from the sun ……. 1
As a result, the arterioles in the skin dilated ……. 1
and the blood flow to the skin increased …….. 1
thus the face became red

Effective communication (C) ***1***

(2) This helps to promote heat loss from the body …… 1
so as to maintain a constant body temperature …… 1

(ii) There was a decrease in heat loss by evaporation …….. 1
Thus the rate of heat gain by his body became greater than the rate of heat loss …….. 1
resulting in an increase in his body temperature.

(iii) Day 1 …….. 1 +
The relative humidity of the afternoon of day 1 is the highest …….. 1
and the wind speed is the lowest ……. 1

Total : 10 + ***1*** marks

4.(b) (i) Rate of breathing = 12 breaths per minute …… 1
Depth of breathing = 500 cm^3 ……. 1

(ii) between 0 and 2.5 second …….. 1

(iii) Intercostal muscles relaxed, so that the ribs moved downward and inward …….. 1
Diaphragm muscles relaxed, so that the diaphragm recoiled to the dome-shape …….. 1
The thoracic / lung volume decreased …… 1
leading to an increase in air pressure in the lungs …….. 1

Effective communication (C) ***1***

(iv) (1) The breathing movements would become faster …… 1

(2) In the left lung, air flow would decrease …….. 1
In the right lung, air flow would increase ……. 1

Total : 10 + ***1*** marks

4.(c) (i) Presence of insect guide)
Large petals)
Stigma / anthers lie within the flower) any two …….. 1, 1
Broad / club-shaped stigma)

(ii) (1) *pollen tube …….. 1
(2) It carries the male gamete …… 1
to meet the female gamete in the ovule …… 1

(iii) C will develop into the seed …… 1 +
which will form a new plant …… 1

B will develop into the fruit …… 1 +
which serves to protect the seeds …… 1
and helps in seed dispersal ……. 1

Total : 10 marks