JINJA JOINT EXAMINATIONS BOARD

MOCK EXAMINATIONS 2022

P530/1

PROPOSED MARKING GUIDE

SECTION A

1 **B**	2 **A**	3 **D**	4 **D**	5 **B**	6 **A**	7 **B**	8 **C**	9 **B**	10 **A**
11 **D**	12 **B**	13 **C**	14 **B**	15 **B**	16 **C**	17 **A**	18 **C**	19 **D**	20 **B**
21 **A**	22 **B**	23 **A**	24 **A**	25 **C**	26 **D**	27 **A**	28 **D**	29 **A**	30 **C**
31 **A**	32 **D**	33 **D**	34 **B**	35 **C**	36 **C**	37 **B**	38 **A**	39 **C**	40 **B**

40 marks/ 1 mark each

SECTION B

41. (a)

Distance between parts	Line
Two poles of the cell	**P;**
A chromosome and a pole	**R;**
Two identical chromosomes	**Q;**

1 ½ marks / @ ½

(b) (i) 15 minutes**;** **1 mark**

(ii) Distance between two identical chromosomes rapidly increase**;**
1 mark

(c) (i) line P

From 0 to 25 minutes, distance between pole remains constant at 40µm**;** because during metaphase and anaphase**;** centrosomes (centrioles) have reached opposite poles and stop moving**;**

1 ½ marks / @ ½

(ii) line Q

From 0 to 15 minutes, distance between two identical chromosomes is 0µm**;** because sister chromatids are still held together by the centromeres during metaphase**;**

From 15 to 25 minutes, distance between identical chromosomes rapidly increases; because spindle fibres split the chromatids and pull them towards opposite poles during anaphase;

2 **marks / @ ½** (iii) line R

From 0 to 15 minutes, distance between chromosome and a pole remains constant at 20 μm; because the cell is in metaphase stage when chromosomes are at equator not moving;

From 15 to 25 minutes, the distance between chromosome and a pole gradually decreases; because after splitting during anaphase; the spindle fibres pull the chromosomes towards the poles;

3 **marks / @ ½**

42. (a) (i) species with population number (size) so low that they are considered to be in danger of becoming extinct (if the cause of their decline continues to operate) ; **1 mark**

(ii) permanent condition of a species of having no living representative in the wild following the death of the last surviving individual of the species; **1 mark**

(b) -hunting (and poaching, overfishing) ;

-deforestation destroying habitats;

-industrialisation producing poisonous gases that pollute environments;

-massive spraying of pesticides;

-swamp reclamation for settlement and agriculture;

-land fragmentation by road constructions destroying habitats;

(Any 4 suggestions) 4 marks / @ 1

(c) -legally protect endangered species;

-recycle waste materials like paper, glass bottles etc to avoid pollution;

-prohibit release of non-native animals and plants into an area;

- restrict trade in endangered species;

- provide breeding programs for endangered species;

- establish sperm banks and seed stores to maintain biodiversity;

- establish national parks, and nature reserves for protecting endangered species;

- restricting urban and industrial developments in natural habitats;

(Any 4 suggestions) 4 marks / @ 1

43. (a) direction away from 5 to the right i.e.(⟶) ; **1 mark**

(b) (i) 1,2,3,4,5; **1 mark**

(ii) 6,7,8,9; **1 mark**

(c) Fully extended cilia move backwards more quickly; exerting greater resistance against water generating a forward force; that propels the organism forward; **3marks / @ 1**

(d) Used to create water currents that move food into gullets of paramecia during feeding;

Locomotion in ciliated microorganisms like paramecia;

Respiratory systems of man like the trachea contain cilia, which trap and remove germs and dust in inhaled hair;

Ciliated cells in female human oviducts move eggs towards uterus for fertilization and implantation;

Ciliated male gametes in some lower plants like ferns use cilia to swim towards female gametes;

(Any 4 suggestions) 4 marks / @ 1

44. (a) species E because; E starts photosynthesizing at low(er) light intensity; and E reaches its maximum rate at low(er) light intensity;

3 marks / @ 1

OR

/ E steep(er) increase in rate of photosynthesis (with small increase in light intensity) ;

/ E has a , higher / greater / faster , rate of photosynthesis (than D) at low light intensities;

(b) shade leaf will have;

1 larger chloroplast(s) ;

2 more chloroplast(s) ;

3 more grana / thylakoids (in chloroplast) ;

4 larger surface area (of leaves) ;

5 more palisade mesophyll cells;

6 leaves with thinner lamina;

7 leaves with thinner cuticles;

8 leaves with smooth leaf lamina (non hairy leaves) ;

(Any 4 comparisons) 4 marks / @ 1

(c) Light energy excites electrons in chlorophyll molecules; in photosystems to higher energy levels to generate ATP molecules in the electron transport chain reactions;

Light energy splits; water molecules during photolysis; to produce hydrogen ions that are used to produce reduced NADP; and electrons to replace excited electrons from photosystem II;

3 marks / @ ½

45. (a) (no increase until after 0.8 – 1%) / increasing CO_2 percentage from 0 to

1.5 % Slowly (slightly) increases rate of breathing;

Increasing CO_2 from 1.5 to 5.4% gradually increases rate of breathing;

Then increasing from 5.4 to 6% rapidly increases rate of breathing;

3 marks / @ 1

(b) An increase in the concentration of carbon dioxide in the blood; stimulates chemoreceptors; in the walls of the carotid artery and the aorta; sending impulses via vagus (sensory) nerve; to respiratory (ventilation) centre in medulla; More impulses (from medulla) ; to diaphragm / intercostals (muscles) ;

Increasing rate of (muscle) contraction (ventilation/breathing);

4 marks / @ ½

(c) During mouth-to-mouth resuscitation expired air contains about 4% (more) CO_2; and this stimulates an increase in the patient's respiratory rate ; enhancing quick recovery;.

Pressing on chest wall will cause atmospheric air with only 0.04% ; (much lower) CO_2 to enter the patient's lungs which is not sufficient enough to stimulate the patient's respiratory rate; and recovery is therefore slower;

3 marks / @ ½

46. (a) (i) GgX^RX^r ; **1 mark**

(ii) If it were recessive all flies of 3 and 4 would be grey ;

OR 3 and 4 grey parents produce black (fly) 9;

OR Grey parents produce black (fly) ;

1 mark

(b) 1. Flies 3 and 4 produce black fly 9 ;
if (fly 3) X chromosome carried the gene for grey body colour and (Fly) 3 would pass dominant allele to 9;

2 marks / @ 1

OR

2. (Fly) 2 and 1 produce 5/grey (fly) ;(Black female produces grey male) ;

(Fly) 5 could not be grey as (Fly) 5 would receive recessive allele from 2 if it was carried on X chromosome;

(c) Genotypes of parents: $GgX^r X^r \times ggX^RY$;

Genotypes of offspring $GgX^R X^r$, $ggX^R X^r$, GgX^rY and $ggX^r Y$;

Phenotypes of offspring: Grey-bodied red-eyed female, black-bodied red-eyed female, grey-bodied white-eyed male, black-bodied white eyed male. ;

Ratio of phenotypes: 1 : 1 : 1 : 1 ;

4 marks / @ 1

If 1, 2 and 3 incorrect allow one mark for correct gametes from incorrect dihybrid parental genotypes.

(d) $p^2 + 2pq = 0.64$ $q^2 = 1 - 0.64$;
$q^2 = 0.36$
$q = 0.6$
$p = 0.4$;
Heterozygous flies $= 2pq = 2 \times 0.4 \times 0.6 = 0.48$;
$= 48\%$;

2 marks / @ ½

END