**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 CO2 percentage from 0 to 1.5 % Slowly (slightly) increases rate of breathing**;**

Increasing CO2 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) CO2 **;** 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) CO2 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**

1. (a) (i) GgXRXr **; 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: GgXr Xr **×** ggXRY**;**

Genotypes of offspring GgXR Xr , ggXR Xr , GgXr Y and ggXr 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) p2 + 2pq= 0.64 q2 = 1- 0.64 **;**

q2 = 0.36

q = 0.6

p = 0.4 **;**

Heterozygous flies = 2pq = 2 X 0.4 X0.6 = 0.48 **;**

= 48% **;**

**2 marks / @ ½**