



Pasir Ris Secondary School

SECONDARY 2E END OF YEAR EXAMINATION 2024

LOWER SECONDARY SCIENCE

Papers 1 and 2

ANSWERS

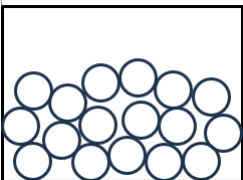
Note: for any sf/unit errors, penalise [$\frac{1}{2}$] up to a max of [2] for the entire paper.

Paper 1

1	2	3	4	5	6	7	8	9	10
B	D	A	C	B	A	C	A	A	D
11	12	13	14	15	16	17	18	19	20
C	D	D	C	B	A	D	C	D	A
21	22	23	24	25	26	27	28	29	30
D	B	D	C	A	D	C	C	C	D

Paper 2 Section A

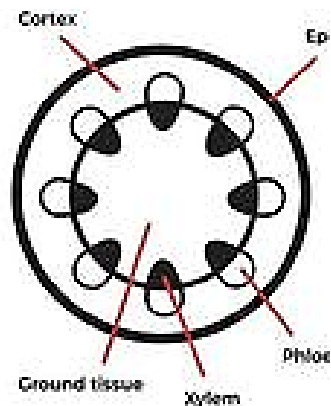
- 1 (a) 1 [1]
- (b) (i) It is **insoluble** [0.5] in **solvent P** [0.5]. [1]
- (ii) 4 [1]
- (iii) Spot 2 is a pure substance / is made up of one component.
Spot 3 is a mixture / made of two components.
Any one conclusion [1]
- 2 (a) The angle of incidence is equal to the angle of reflection. [1]
The incident ray, reflected ray and normal at point of incidence all lie in the same plane. [1]
- (b) (i) concave mirror [1]
- (ii) upright [1]
magnified [1]
- Accept: virtual

- 3 (a) Bacterial cell has cell wall ; R: unlabelled organelles [1]
- (b) Bacterial cell does not have nucleus ; [1]
- (c) Unable to make food ; [2]
Does not contain chloroplasts ;
Unable to absorb light + photosynthesise ;
- Any 2
- 4 (a)  [1]
- (b) B [1]
- (c) arrangement: very **closely packed** in an **orderly** manner [1]
movement: **vibrate** about in their **fixed** positions [1]
(reject: move)
- (d) Energy is needed to **overcome forces of attraction**. [1]
- 5 (a) (i) **carbon dioxide** gas [1]
(reject formula)
- (ii) test: **bubble** the gas into **limewater** [1]
observations: **white precipitate** forms in limewater [1]
- (b) sulfuric acid [1]
copper carbonate + sulfuric acid → copper sulfate + water + carbon dioxide [1]
- (c) Place a **moist blue** and **red** litmus paper on the surface of the crystals. [0.5]
Both litmus papers remain **unchanged**. [0.5]
- 6 (a) (i) Radiation ; [1]
- (ii) Solar panel can be painted black (A: any dark colour) / rough surface ; [1]
Dark / rough surfaces are good absorbers of (radiated) heat ; [1]
- (iii) Metal + conducts heat fastest from the solar panel ; (R: no link to solar panel) [1]
- (b) Heat transferred from surrounding air to pack by conduction / convection ; [2]
Cooled air around pack is denser than air around apple ;
Cooled air sinks to bottom of box to remove heat from apple ;
- Any 2

Section B

- 7 (a) (i) work is done when the man lifts the plant off the ground. [0.5]
 force is acted on the pot in the same direction as the movement [0.5]
 work is not done when the man carries the pot to the right of the room [0.5]
 force acted on the pot is not in the same direction as the movement [0.5]
 work is done when the man places the pot on the ground. [0.5]
 force is acted on the pot in the same direction as the movement [0.5]
- (ii) place wheels beneath the pot / make the floor smoother [1]
 accept any reasonable answer
- (b) (i) positive → negative (draw at least two arrows) [1]
- (ii) voltmeter placed parallel to the dry cells [1]
 ammeter placed in series any where in the circuit [1]
- (iii) chemical potential energy → electrical energy → kinetic energy → sound energy [2]
 [each energy 0.5m]
- (iv) refrigerator / electric iron / air conditioner etc (any one) [1]
- 8 (a) (i) Preservation (A: saving) of wildlife / natural resources ; [1]
- (ii) Energy-efficient appliances / use appliances only when needed / use less appliances ; A: OWTTE [1]
- (b) (i) Algae are producers / absorb light energy OR sunlight ; [2]
 Produce food through photosynthesis ;
 Maintains other populations by providing energy as food ;
 Any 2
- (ii) Ref. to suitability of climate for
 1. adaptive traits of algae ; [1]
 2. behavioural traits of algae ; [1]
- (iii) Underwater plants are unable to photosynthesise ; [1]
 Underwater plants may die due to lack of food / marine animals die due to lack of plants for food ; [1]
- (iv) Algae does not obtain nutrients from other organisms ; [1]
 Algae does not kill / consume other organisms ; [1]
- 9 (a) Amylase / carbohydrase ;
 Simple sugars / maltose ; (A: glucose)
- (b) (i) Brown solution turns blue-black ;
- (ii) Sugar / maltose / product (particles) are small enough to pass through pores of the Visking tubing walls ;
 Higher concentration of sugar in the Visking tubing than outside ;

- (c) (i) Percentage of undigested starch
 - decreases from 100 % to 77.5 % when in mouth and oesophagus ; [1]
 - remains unchanged in the stomach ; [0.5]
 - decreases from 75 % to 0 % in part X and large intestine ; [0.5]
- (ii) Physical digestion of starch ; (R: not chemical digestion) [0.5]
 Starch is not chemically changed / digested / reacted + no new products ; [0.5]
- (iii) Carbohydrase / amylase / enzymes are destroyed / denatured ; [1]
 A: no carbohydrase produced in stomach
- (iv) Absorption of digested food (substances) / nutrients (A: any end product of digestion) [1]
- 10 (a) (i) X – urethra [0.5]
 Y – testis / testes [0.5]
- (ii) Sperm ducts are cut and tied ; [1]
 Semen ejaculated by males during intercourse do not contain sperms ; [1]
- (iii) The male sex hormone is released into blood + transported around body ; [1]
 R: male sex hormone is not released out of the body
- (b) (i) 21 days ; (no unit – 0m) [1]
- (ii) Egg has died / deteriorated / degraded / disintegrated one day after ovulation (before day 20) ; [1]
 No fertilisation occurred / fusion with sperm nuclei ; [1]
- (c) (i) Spermicide ; [1]
- (ii) Improper use of condom + leakage of semen ; [1]
 Semen containing virus / bacteria may be in contact with walls of vagina ; [1]
- 11 (a) Higher amount / percentage / water potential of water in soil than root cells (A: cells within plant) ; R: water concentration [1]
 Water moves into cells by osmosis ; [1]
 Water (molecules) is small enough is pass through partially permeable membrane of cells ; [1]
- (b) [1]



1m – inner ring shaded ; (labels not required)

(c)

plant number	total mass of pears/ g
1	75
3	525
2	750

[2]

All correct – 2m
One correct – 1m

(d)

Transports food / sugars produced by photosynthesis ;
From leaves to the rest of the plant ;

[1]**[1]****(e)**

Removal of the phloem during ringing ;
Maximum amount (A: most / all) of food / sugars transported from leaves to
pear / fruits ;

[1]**[1]**