

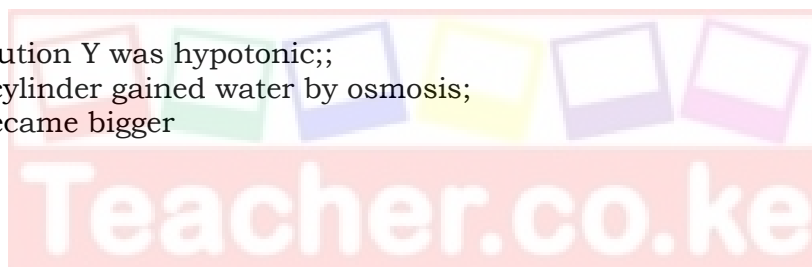
BIOLOGY PAPER 3 231/3

1. (a)

Cylinder in solution		Initial length	Final length	Average length	% change in length
X	1	40mm	38 - 39.5	38.75mm	96.88%
	2	40 mm (1 mk)	(mm) mm (1 mk)	±0.5 (1 mk)	±1.0 (1 mk)
Y	1	40mm	40.5 - 42	41.25mm	103.13%
	2	40mm (1 mk)	(mm) (mm) (1 mk)	±0.5 (1mk)	±1.0 (1 mk)

(b) (i) In X – Solution X was hypertonic;
Potato cylinder lost water by osmosis;
(thus decrease in length) (2 mks)

(ii) In Y – solution Y was hypotonic;;
Potato cylinder gained water by osmosis;
(and became bigger) (2 mks)



Food substance	Procedure	Observation	Conclusion
Starch ½ mk	Put a little of solution B in a test tube Add 3 drops of iodine solution 1 mk	Blue black colour ½ mk	Starch present ½ mk
Protein ½ mk	Put a little of solution B in a test tube Add equal amount of sodium hydroxide and shake; Add a few drops of copper sulphate and shake; 2 mks	Blue Colour ½ mk	proteins absent ½ mk
Reducing sugar ½ mk	Put a little of solution B in a test tube Add equal amount of benedicts solution and heat; 1 mk	Colour Blue colour ½ mk	Reducing sugar absent ½ mk
Non-reducing sugar ½ mk	Put a little of solution B in a test tube Add a few drops of dilute Hcl and heat then cool; Add sodium hydrogen carbonate drop by drop until fizzing stops. Add equal amount of benedicts and heat; 2 mks	Colour changes from blue to green to yellow orange ½ mk	Non-reducing sugar present ½ mk

2. (a) C - Wind; - inconspicuous petals/large anthers loosely attached to flexible filaments/Long feathery stigma which hang outside the flower; (2mks)
- D - Insect - Large flowers with brightly coloured petals/ produce nectar (insect on diagram)
- (b) Phylum Arthropoda;-
- Reason - jointed appendagos/presence of exoskeleton/segmented body/3 body parts; (2 mks)
- Class - Insecta;

- Reason - 3 body parts/A pair of antennae
Pair of compound eyes/spiracles for breathing;
- (c) A - Telophase; - Cell constricts in the middle/chromatids
Collect at opposite end/nuclear membrane forms round
Chromatids;
- B - Prophase; - Centriole at opposite poles/chromosomes thicken and
shorten/Nucleolus disappear.
- C - Metaphase - Nuclear membrane disappear/spindle fibres lengthen/
chromosome arrange at the equator of spindle;
- D - Anaphase; - Chromatids separate at centromere and migrate to
opposite poles/spindle fibres begin to disappear;
(8 mks)

