

G CHIJ St. Nicholas Girls' School
2016 Secondary 4 (O Level) Biology Prelim
Marking Scheme and Markers' Report

General Comments

Generally, candidates who attempted the Either question performed better with a handful of candidates scoring close to full marks. Most students did not perform well for this exams. Answers generally lacked details and precision.

Paper 1 (40 marks)

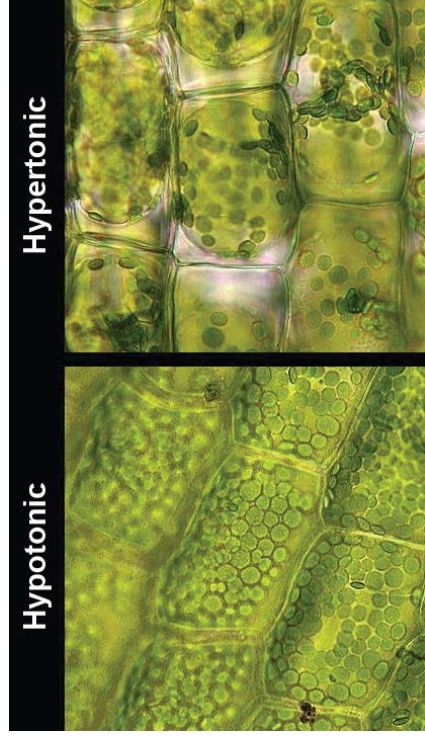
Question Answer	1 D	2 A	3 B	4 D	5 C	6 C	7 B	8 A	9 B	10 B
Question Answer	11 B	12 A	13 A	14 A	15 D	16 D	17 C	18 B	19 B	20 A
Question Answer	21 B	22 D	23 A	24 C	25 A	26 D	27 B	28 C	29 B	30 C
Question Answer	31 A / C	32 A	33 D	34 B	35 D	36 B	37 A	38 B	39 D	40 A

Comments on MCQ

Question 4

77% of candidates got this question incorrect. Most candidates chose distractor A instead of answer D.

Candidates showed understanding that the vacuole will decrease in size due to the movement of water out of the cell by osmosis. However, they were careless and failed to identify the slight change in shape in the cell wall due to the shrinkage of the cytoplasm.



Question 5

57% of candidates got this question incorrect. Most candidates chose distractor A instead of answer C. Candidates failed to recognise water as the main constituent of the amniotic fluid, which provides protection to a growing foetus.

Question 11

Many candidates chose options A and C instead of answer B.

From the graph, the % of stomata that are open varies with changes in light intensity throughout 24 hours in a day. No information on temperature is given. With the graph being higher during daytime and higher % of stomata are open, it can be deduced that transpiration occurs at a higher rate. It also cannot be deduced from the graph that photosynthesis only occurs in light because in darkness, there are still gases present within the intercellular air spaces.

Question 12

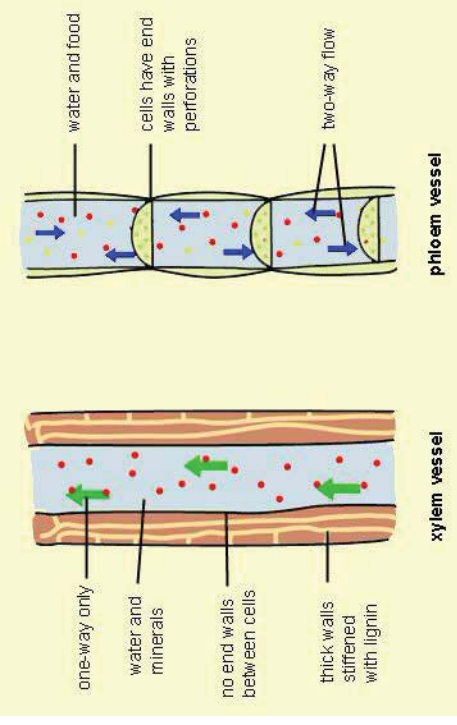
44% of candidates chose distractor D instead of answer A.

While candidates understand that light intensity was the limiting factor at the start of the graph, they failed to understand that for graph of Y, they will have to compare it with the graph below and the difference in carbon dioxide concentration indicates that it is the change in that condition that results in a higher rate in graph of Y.

Question 14

55% of candidates chose distractor C instead of answer A.

Candidates wrongly identified the cells as the sides as sieve tube cells and wrongly deduced the vessel to be the phloem. Candidates should be able to recognise the shape of companion cells. They are slightly flattened and tapered at ends.

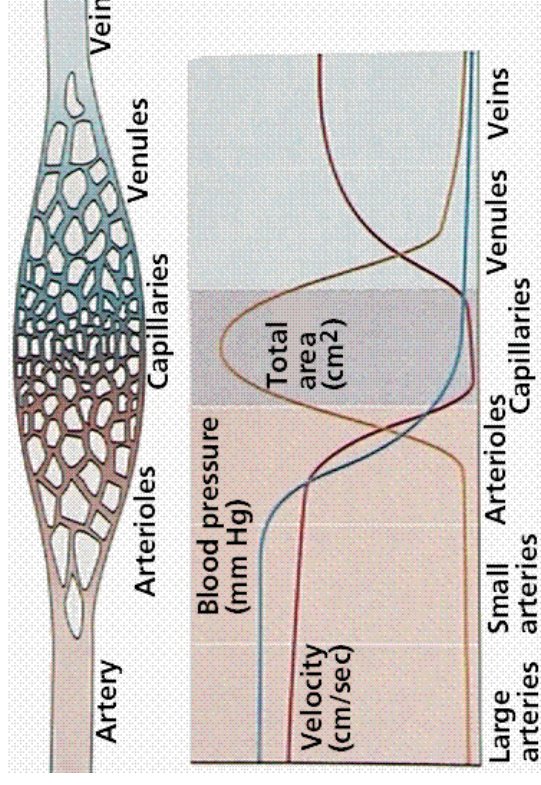
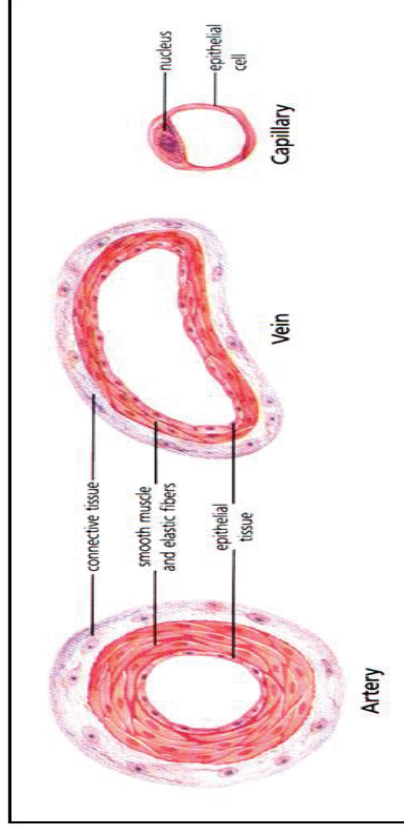


Question 15

65% of candidates got this question incorrect. Most candidates chose distractor C instead of answer D.

Candidates failed to recognise that the layer of smooth muscles is much thinner in vein, resulting in a thin wall in veins. Velocity of blood in the vein is also quite high.

trendyline



Question 16

25% of the candidates chose distractor C instead of answer D.

Candidates did not recognise that the pulmonary artery, which usually transports deoxygenated blood from right of heart to lung, will receive oxygenated from the left atrium due to ASD.

Question 17

40% of the candidates chose distractor A instead of answer C.

Student did not remember that the stimulus for breathing is the need to remove carbon dioxide, a byproduct of cellular respiration. Thus, a rise in carbon dioxide concentration in the blood leads to an increase in breathing rate.

Question 20

33% of the candidates chose distractor C instead of answer A.

Candidates did not recognise that ADH is secreted by the hypothalamus, which is also the receptor for the stimulus (change in blood water potential).

Question 27

35% of candidates chose distractor A instead of answer B. Candidates know that Hormone X is insulin. But between 9-10am when blood glucose concentration is low and insulin is not needed, it cannot be assumed that the concentration of insulin is absolute zero in the blood.

Question 34

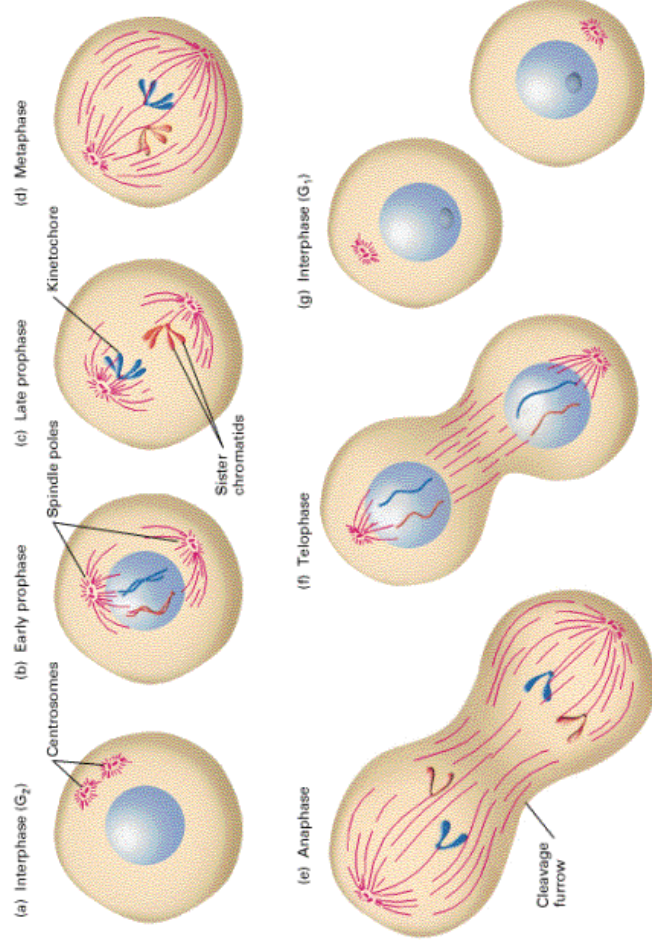
46% of the candidates got this incorrect. Many candidates chose distractor D instead of answer B.

Cells which are not dividing (highest number in root) are in interphase, the resting phase. Only when cells are ready to undergo nuclear division, DNA replication occurs, forming sister chromatids. Hence, sister chromatids, which are 2 identical DNA strands joined at the centromere, are only present during Prophase and Metaphase, before they are separated to form individual daughter chromosomes when the centromere separates in anaphase.

$$73 + 16 = 89$$

$$89/1000 \times 100\% = 8.9\%$$

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Question 35

Most candidates chose distractor C instead of answer D.

Candidates did not remember that a gene is a **double-stranded segment of DNA**.

240 amino acids x 3 nucleotides in a codon = 720 nucleotides in mRNA strand = 720 nucleotides in DNA template strand
 720 x 2 = 1440 nucleotides (or 720 base-pairs) in gene

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