

**MARK SCHEME for the May/June 2009 question paper
for the guidance of teachers**

5090 BIOLOGY

5090/03

Paper 3 (Practical Test), maximum raw mark 40

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- 1 (a) (i) number of teeth ; [1]
(ii) X's in Fig. 1.1 ; [1]
(iii) not yet through because of age / removed ; [1]
(iv) biting/cutting/grinding/crushing ; **R** ref molecules.
to increase surface area of food (for enzyme action) ; [2]
/mechanical digestion

(b) (i)

	Immediate observation	Observation after 30 minutes
plain cotton bud (without sugar)	green/yellow	darker/deeper yellow ;
treated cotton bud (with sugar)	paler green/orange/yellow	orange/red ;

(1 mark per line) [2]

- (ii) orange/red – more acidic ;
because sugar converted to acids ;
by bacteria ; [3]

(c) (i) & (ii)

add iodine (to starch/substrate) ;
brown (etc)/colour of iodine – negative ;
(blue) black if starch present ;
add Benedict's, heat ;
blue to green/orange/red if reducing sugar etc ; [max 4]

(d) (i) Table 1.3

		test for starch	test for product
first test	amylase	negative	negative (for reducing sugar) ;
	starch	starch present / +ve	negative (for reducing sugar) ;
second test	with salt added	no starch present ;	yellow/orange ;
	without salt added	(starch still) present ;	blue/green (less than with salt) ;

[max 5]

- (ii) salt speeds activity of amylase ;
more breakdown of starch ;
more sugars formed ;

without salt: breakdown of starch starts ;
but some still present ;
some sugars formed ; [max 3]

[Total: 22]

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- 2 (a) Consider as a whole.
- Drawing:
all 3 attempted ;
good quality, double lines, minimal shading etc ;
- Measurements:
units (once), cm to 0.1 in all 3 ;
realistic accuracy (even if no units) ;
- Labels/Description:
testa ;
no germination/growth ;
ref normal **S3** ;
green, c.f. white/pale **S2** ;
etiolation ;
tall v short(er) stature ;
root hairs drawn & labelled ; [max 8]
- (b) (i) in **S1** enzymes/metabolism slower at low temp ;
so less energy/material from store ; [2]
- (ii) in **S2** no light so no photosynthesis ;
not green/no chlorophyll present ;
growth longer & thinner/etiolated ; [max 2]
- (c) (i) good shape of root tip, with root hairs ;
label: root hairs ; [2]
- (ii) increased surface area for absorption AW ; [1]
- (d) (i) mitosis ; [1]
- (ii) unspecialised cells ;
dividing repeatedly ; **A** reproducing
± same shape/size ; [max 2]
- [Total: 18]**