CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2012 series

5129 COMBINED SCIENCE

5129/21 Paper 2 (Theory), maximum raw mark 100

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 plasma
red
white
antibodies
fibrinogen
fibrin [6]

2 **(a)** pencil does not mix with the dyes (or converse)
pencil insoluble in water [1]

(b) blue
yellow
do not accept : other colours [2]

(c) X
contains only one colour [2]

3 **(a)** **(i)** 1.79 [1]

(ii) as length increases, period increases.
do not accept directly proportional [1]

(b) **(i)** B [1]

(ii) potential to kinetic [1]

4 **(a)** **(i)** obese student D
correct weight student B [2]

(b) **(i)** cheese
beef [2]

(ii) take more exercise
reduce total food intake / eat less [1]

(c) **(i)** fibre is the part of the food that cannot be digested [1]

(ii) muscles of alimentary canal can grip on it
peristalsis more efficient / rapid
prevents constipation } any 2 [2]

5 **(a)** **(i)** 14

(ii) 6

(b) 2, 4 [1]

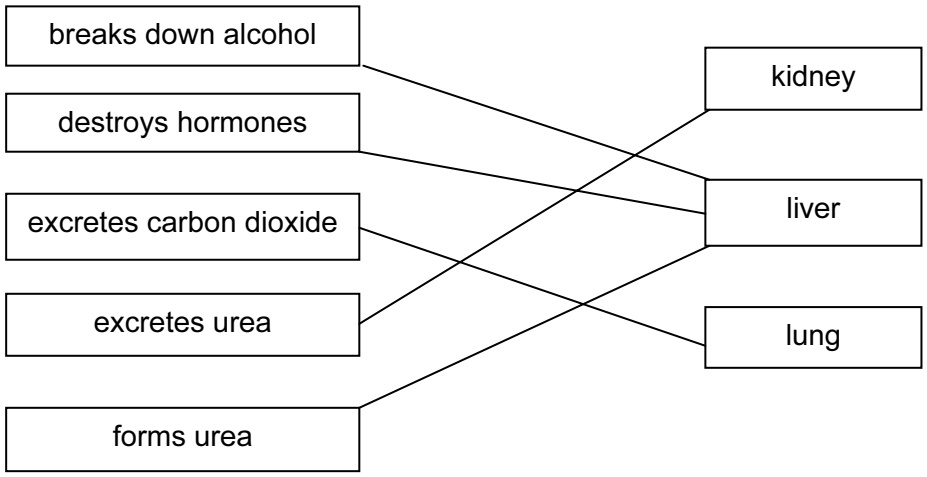
(c) covalent (must have for first mark)
electrons shared
to make full outer shell / inert gas structure [3]

6 **(a)** A and C (both) [1]

(b) **(i)** 0.3 [1]

(ii) V = IR **or** R = V / I **or** 1.5 / 0.2
= 7.5
Ω (unit independent) [3]

7



[5]

8 **(a)** **(i)** hydrogen / H^+ [1]

(ii) hydroxide / OH^- [1]

(b) **(i)** 7 [1]

(ii) green [1]

(iii) 22 [1]

(iv) $H^+ + OH^- \longrightarrow H_2O$ [1]

9 **(a)** **(i)** approximately correct direction

(ii) 48 [1]

(b) **(i)** ray bends towards normal (ignore lines below block) [1]

10 **(a)** **(i)**

prostate gland	C	
testis	E	
urethra	D	[3]

(ii)

prostate gland	secretes fluid / semen / seminal fluid	[1]
testis	produces sperm	
	produces / secretes hormone / testosterone / androgen	[1]
urethra	transports sperm / semen / seminal fluid	[1]

(**do not accept :** channel for / transports urine)

(iii) holds testis outside body cavity
to keep sperm cool
sperm develop most effectively below normal body temperature
if testis becomes too cool scrotum contracts
testis pulled close to body to keep it warmer } any 2 [2]

(b) an x drawn on one of the sperm ducts [1]

11 **(a)** **(i)** cracking [1]

(ii) B = hydrogen / H_2
C = ethanol / C_2H_5OH [**do not accept :** alcohol]
D = poly(ethene) [3]

(b) **(i)** contains a carbon to carbon double bond [1]

(ii) orange to colourless / goes colourless [1]

12 **(a)** positive and negative, roughly equal
correct shape [2]

(b) number of turns in the coil
strength of magnetic field
rate of rotation
area of coil } any 2 [2]

(c) E = Pt **or** 200 × 300
= 60 000 [1000 = 1 mark] [2]

13 (a) by osmosis / description of osmosis
water in soil taken in through root hair cells
large surface area (per volume) } any 1

(b) (i) wilting / wilted [1]

(ii) greater loss of water from plant than water uptake
by transpiration
cells lose turgidity
loss of support / cell walls limp / floppy / bendy } any 2 [2]

14 (a) mass of one molecule of substance
relative to one atom of carbon-12 [2]

(b) 106 44 [2]
10.6 4.4 (divide by 10) [1]
2.65 (divide by 4) [1]

15 (a) 46 – 32 = 14 [1]

(b) mass = volume × density **or** 14 × 3 **or** (a) × 3
= 42 **or** answer to (a) × 3 [2]

16 (a) (i) wood is an insulator / poor conductor [1]

(ii) (shiny) white is a poor emitter / matt black is a good emitter [1]

(b) air expands / becomes less dense [1]

(c) clinical has smaller range
constriction
retains reading
triangular cross-section
more sensitive } any 2 [2]

17 (a) B [1]

(b) E [1]

(c) D [1]
m.p. above room temperature
in Group 6 of the Periodic Table [2]

18 **(a)** positive

(b) opposite charges attract [

(c) 3×10^8 [1]

19 **(a)** X = neutral
Y = Earth
Z = live
3 correct = 2 marks 2 correct = 1 [2]

(b) if current exceeds 10 A / rating / can carry up to 10A
Fuse melts / blows [1]