



Inheritance

Mark Scheme 7

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Inheritance
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 7

CHEMISTRY ONLINE
— TUITION —

Time Allowed: 56 minutes

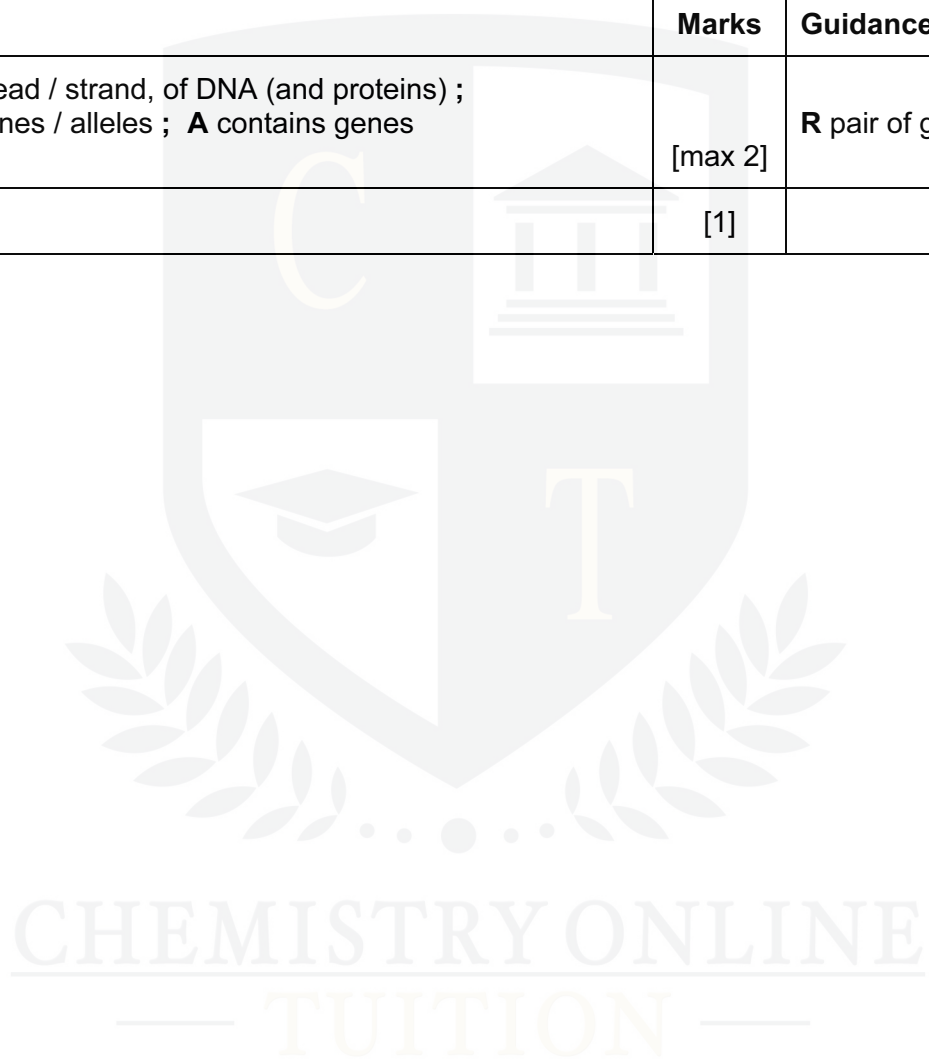
Score: /46

Percentage: /100

1 (a)	function	name of organ	letter from Fig. 3.1	[3]	ignore lining / endometrium – <i>not an organ</i> R uterus wall R 'egg, canal / tube'
	production of gametes	ovary	T ;		
	site of implantation	uterus	X ;		
	site of fertilisation	oviduct / fallopian tube	R ;		
	dilates during birth	cervix	V		
(b) (i)	ovary / ovaries ; ignore T			[1]	R follicle – <i>not an organ</i>
(ii)	makes (Graafian) follicle, form / develop / mature / be produced ; causes, secretion / release / production, of oestrogen ;			[max 1]	A egg / ovum / gamete for follicle R ovulation / described

	Answer	Marks	Guidance for Examiners
1 (c) (i)	award the following to max 3	award max 2 for data quotes including changes in concentration over stated number of days - units must be used at least once in the answer	
	increase from, day 1 / first day, to day 11 ; A peaks at day 11 / increases over first 10/11 days	155 / 156 (arbitrary) units on day 11 ;	
	decreases from day 11 to day 15 ;	54 / 55 (arbitrary) units on day 15 ;	
	increases to day 20 / peaks (again) at day 20 ;	136 (arbitrary) units on day 20 ;	
	decreases to, day 27 / last day ;	40 (arbitrary) units on day 27 ;	
	[max 4]		
(ii)	release of, egg / egg cell / ovum / oocyte / female gamete ; either from, ovary / follicle or into fallopian tube / oviduct ;	[2]	R ovule
(d)	1 sperm cell digests way through, jelly coat / AW ; 2 uses enzymes (from acrosome) ; 3 sperm, attaches to / fuses with, egg / AW ; A fusion of gametes 4 whole sperm cell enters egg / head of sperm enters egg ; 5 (egg membrane changes so that) no other sperm can enter ; 6 haploid / 23 chromosomes ; 7 nuclei, fuse / join ; A ref to chromosomes 'coming together' 8 diploid / 46 chromosomes ; 9 zygote ;	[max 3]	ignore egg wall / cell wall ignore events after fertilisation

	Answer	Marks	Guidance for Examiners
1 (e) (i)	length / molecule / thread / strand, of DNA (and proteins) ; made of (string of), genes / alleles ; A contains genes	[max 2]	R pair of genes
(ii)	46 ; A 23 pairs	[1]	



2	(a)	MP1 attach to virus / bacteria / antigens ; MP2 prevent movement around the body ; MP3 prevent entry into <u>cells</u> ; MP4 stop division ; MP5 combine with / neutralise, toxins ; MP6 clump, bacteria / viruses, together ; MP7 help phagocytes engulf virus / bacteria ;	[max 3]										
	(b)	kidney would be rejected ; (lymphocytes produce anti-A) antibodies ; (antibodies) attach to blood vessels ;	[max 2]										
	(c)	no, blood / capillaries / antigens / antibodies / white cells / lymphocytes, in the cornea ;	[max 1]										
	(d)	$I^A I^O \times I^B I^O$; $I^A I^O + I^B I^O$; $I^O I^O$;	[3]										
	(e)	<table><tr><td>term</td><td>example</td></tr><tr><td>a dominant allele</td><td>I^A</td></tr><tr><td>heterozygous genotype</td><td>$I^A I^O / I^B I^O / I^A I^B$;</td></tr><tr><td>codominant alleles</td><td>I^A and I^B ;</td></tr><tr><td>phenotype</td><td>(blood) group, A / B / AB / O ;</td></tr></table>	term	example	a dominant allele	I^A	heterozygous genotype	$I^A I^O / I^B I^O / I^A I^B$;	codominant alleles	I^A and I^B ;	phenotype	(blood) group, A / B / AB / O ;	[3]
term	example												
a dominant allele	I^A												
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phenotype	(blood) group, A / B / AB / O ;												
[Total: 12]													

3 (a)	$\frac{34/35/36\text{mm}}{0.14}$ <p>answer = (x) 243 to 257 ;;</p>	[2]	
(b)	<p>no, flagellum / tail ; no, acrosome / (digestive) enzymes ; has, food / energy, store ; more cytoplasm ; larger nucleus ; more membrane / larger surface area ;</p>	[max 3]	<i>only accept structural points</i>
(c)	<p>reduces / halves, number of chromosomes ; so number of chromosomes does not double each generation ; gives variation ;</p>	[max 2]	

3 (d)	<p><i>man</i> cannot produce sperm ; sperm cannot swim / defective sperm / AW ; few sperm / low sperm count ; blockage of, epididymis / vas deferens ; result of, STD / named STD ; AVP ; had a vasectomy / problem with ejaculation / not enough nutrient in semen</p> <p><i>woman</i> low concentration of / no, FSH ; follicles do not develop / cannot ovulate ; damaged / blocked / cut, oviduct ; AVP ; e.g. post menopause / embryo cannot implant / uterine lining does not thicken</p>	[max 1]	
(e)	<p>to increase chances of fertilisation ; fertilisation occurs in the oviduct ; sperm can only survive for a few days (in the oviduct) ; placed in the uterus and not in the vagina as sperm less likely to die / AW ; AVP ; e.g. ref to female's immune system takes 1–2 days for sperm to reach, egg / oviduct</p>	[max 3]	
(f)	<p>to maintain, endometrium / lining of uterus ; for implantation ; prevent loss of embryo (through menstruation) ; inhibits, secretion / release, of FSH / LH ; no development of (more) follicles / AW ;</p>	[max 3]	
(g)	<p>number of women who become pregnant out of all women who have AI ; as a percentage / out of every 100 ;</p>	[2]	
[Total: 17]			