

Reproduction

Mark Scheme 4

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Reproduction
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 4

CHEMISTRY ONLINE
— TUITION —

Time Allowed: 53 minutes

Score: /44

Percentage: /100

Question		Marks	Additional Guidance
1 (a) (i)	X – protein (coat / AW) / capsid / capsomere(s); Y – genetic material / nucleic acid / RNA;	2	A DNA / gene(s) R nuclear material / chromosome
(ii)	cell wall; cell membrane; cytoplasm; loop of DNA; (slime) capsule; flagellum / flagella; plasmids; ribosome(s); AVP;	max 3	R cellulose cell wall I size / complexity / shape e.g. pi
(b) (i)	number of people living with HIV: numbers living with HIV increased (from 1990), levelled off / increased slightly, from 2000 / 2001 / 2002; any one correct data quote from vertical axis for numbers living with HIV; number of people newly infected with HIV: numbers newly infected increased (and levelled off between 1994 and 1998) and decreased since, 1997 / 1998; any one correct data quote from vertical axis for numbers newly infected with HIV;	4	date quotes must have correct year, but A 'starts' for 1990 and 'ends' for 2009 / 2010 A any correct manipulation of the data, e.g. increased by / percentage increase, etc. A $\pm \frac{1}{2}$ a square for data quotes

Question		Marks	Additional Guidance
1	(ii) people living with HIV are living longer; success of (named) treatment for HIV / AIDS; success in reducing transmission; reference to, education / information / funding, about HIV / AIDS;	max 2	e.g. drugs / antivirals / AZT / nursing care A ref. to barrier contraception / condom / femidom
	(iii) from mother to fetus / across the placenta; from mother to baby at birth; in breast milk; unprotected / unsafe sex; sharing, needles / syringes; in blood products / blood for transfusion / transplants / blood to blood contact; AVP;	max 3	R saliva R other sharps, e.g. razors unless qualified by blood contact R using contaminated / dirty / used, needles unqualified A intravenous drug use / AW R donating blood R blood unqualified A 'blood exchange' I body fluids unqualified
	(iv) weakens the immune system / reduces capacity of body to respond to disease / AW; <u>lymphocytes</u> are, damaged / destroyed / killed / not functional; (B / T) lymphocytes / white blood cells, stop making antibodies; any two roles of antibodies or lymphocytes or phagocytes which will not happen or not happen very well;;	max 3	R 'no immune system' / 'destroys immune system' A 'fight' disease antibodies stop, pathogens spreading (in the body) antibodies cause pathogens to, clump / agglutinate antibodies kill bacteria antibodies make it easier for phagocytes to ingest pathogens antibodies, neutralise toxin(s) / make toxins harmless phagocytes, ingest / AW, pathogens lymphocytes kill infected cells
		[Total: 17]	

2 (a)	increase in size / AW; increase in <u>dry</u> , mass / weight;; increase in number of cells; reference to permanent;	max 3	increase in dry mass = 2 marks I development A reference to cell division / mitosis / reproduction of cells or tissues R reproduction unqualified
(b)	– uterus; B – cervix; C – vagina;	3	I womb
(ii)	D – mitosis / cell division; E – implantation / AW;	2	A embedding / attachment R attachment to placenta I into uterus wall
(iii)	<u>peristalsis</u> ; (waves of) contractions; ciliary action / described; movement of fluid (in oviduct);	max 2	A movement by (tiny) hairs R villi / microvilli
		[Total: 10]	

CHEMISTRY ONLINE
— TUITION —

3 (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
3 (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
(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]	

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