Reproduction

Mark Scheme 4

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

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** ± ½ 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]	

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

<table>
<tr><th></th><th colspan="2">Answer</th><th>Marks</th><th>Guidance for Examiners</th></tr>
<tr><td>3 (c) (i)</td><td colspan="2">
<table>
<tr><td>award the following to max 3</td><td>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</td></tr>
<tr><td>increase from, day 1 / first day, to day 11 ;
A peaks at day 11 / increases over first 10/11 days</td><td>155 / 156 (arbitrary) units on day 11 ;</td></tr>
<tr><td>decreases from day 11 to day 15 ;</td><td>54 / 55 (arbitrary) units on day 15 ;</td></tr>
<tr><td>increases to day 20 / peaks (again) at day 20 ;</td><td>136 (arbitrary) units on day 20 ;</td></tr>
<tr><td>decreases to, day 27 / last day ;</td><td>40 (arbitrary) units on day 27 ;</td></tr>
</table>
[max 4]
</td><td></td><td></td></tr>
<tr><td>(ii)</td><td colspan="2">release of, egg / egg cell / ovum / oocyte / female gamete ;

either
from, ovary / follicle
or
into fallopian tube / oviduct ;</td><td>[2]</td><td>R ovule</td></tr>
<tr><td>(d)</td><td>1
2
3
4
5
6
7
8
9</td><td>sperm cell digests way through, jelly coat / AW ;
uses enzymes (from acrosome) ;
sperm, attaches to / fuses with, egg / AW ; A fusion of gametes
whole sperm cell enters egg / head of sperm enters egg ;
(egg membrane changes so that) no other sperm can enter ;
haploid / 23 chromosomes ;
nuclei, fuse / join ; A ref to chromosomes ‘coming together’
diploid / 46 chromosomes ;
zygote ;</td><td>[max 3]</td><td>ignore egg wall / cell wall

ignore events after fertilisation</td></tr>
<tr><td>(e) (i)</td><td colspan="2">length / molecule / thread / strand, of DNA (and proteins) ;
made of (string of), genes / alleles ; A contains genes</td><td>[max 2]</td><td>R pair of genes</td></tr>
<tr><td>(ii)</td><td colspan="2">46 ; A 23 pairs</td><td>[1]</td><td></td></tr>
</table>