Question Number	Answer	Acceptable answers	Mark
1(a)(i)	an increase in cases until **October** and then a decrease (in the number of cases) (1)	accept an increase in cases till **November** when it decreases	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(a)(ii)	1320 (1) 1320 − 168 = 1152	**2 marks for correct answer**	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(b)	exponential (growth)	log / logarithmic (growth)	**(1)**

Question Number	Answer	Acceptable answers	Mark
1(c)	**A suggestion including two of the following** not everyone has been immunised (1) immigration introduces people who are not immunised (1) immunisation not fully effective (1) immunity can decrease with age (1)	 accept no herd immunity accept bacteria mutates (making immunisation ineffective) accept immunity requires boosters/loss of memory lymphocytes	**(2)**

Question Number	Answer	Acceptable answers	Mark
1(d)	**A description including the following** (immunisation) introduces an antigen/(immunisation) causes an immune response (1) (B) lymphocytes (1) production of antibodies (1) (the production of) memory lymphocytes (1)	 accept immune system recognises an antigen (in the immunisation) ignore white blood cells	**(3)**

Total for Question 1 = 9 marks

Question Number	Answer	Mark
2a(i)	**A** - bacterium	**(1)**

Question Number	Answer	Acceptable answers	Mark
2a(ii)	A description to include two of the following points: Housefly carries a pathogen (1) housefly lands on (contaminated) faeces/animal waste (1) transfers dysentery /bacteria onto food (1) (infected) food eaten (1)	Ignore references to other types of disease transmission lands on food /infects the food	**(2)**

Question Number	Answer	Acceptable answers	Mark
2a(iii)	An explanation to include the following points: <u>Hydrochloric</u> acid / <u>HCl</u>(1) in stomach (1) (acid) kills bacteria/ dysentry (1)	Both words needed for mark – stomach acid gets 1 mark for stomach. destroys/breaks down accept correct responses about antibodies/antitoxins for 1 mark	**(3)**

Question Number	Answer	Acceptable answers	Mark
2(b)	an explanation to include two of the following points: mosquito is a <u>vector</u> (1) carries **protozoan/*Plasmodium*** (1) pierces skin (1) transfers (protozoan/*Plasmodium*) to blood (1)	Accept bites/injects/ sucks blood / feed on blood for pierces skin	**(2)**

(Total for question 2 = 8 marks)

Question Number	Answer	Acceptable answers	Mark
3(a)(i)	A description including the following points: • as mean mass increases so does the percentage of population with type 2 diabetes (1) • correct readings from the graph to illustrate the comparative point (1)	**accept** positive correlation ORA	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(a)(ii)	A suggestion linking **two** of the following: • increasing body mass leads to over weight / obesity • don't respond to insulin / reference to insulin resistance		**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(i)	Calculation (1.7 x 1.7) = 2.89 (1) 78 / 2.89 = 27 (1)	Two marks for correct bald answer Ecf for incorrect numbers but correct calculation 26.98 / 26.9 Accept continued decimal places	**(2)**

Question Number	Answer	Acceptable answers	Mark
3(b)(ii)	**C** ☒ overweight		**(1)**

Question Number	Answer	Acceptable answers	Mark
3(c)	A description linking **three** of the following: • glucagon is released (1) • from the pancreas (1) • glycogen to glucose (1) • in the liver / muscle cells(1) • which acts to raise blood glucose levels (1)	correct spelling of glycogen and glucagon only No mark for glucagon is injected Ignore references to glucagon turning into glucose	**(3)**

Total for question 3 – 10 marks

Question number	Answer	Additional guidance	Mark
4(a)	• 830 mm = 0.83 m (1) • 0.83/0.99 = 0.8383… = 0.84 to two d.p. (1) OR • 0.99 m = 990 mm (1) • 830/990 = 0.8383… = 0.84 to two d.p. (1) • Answer must be given to 2 decimal places	award full marks for correct numerical answer without working	**(2)**

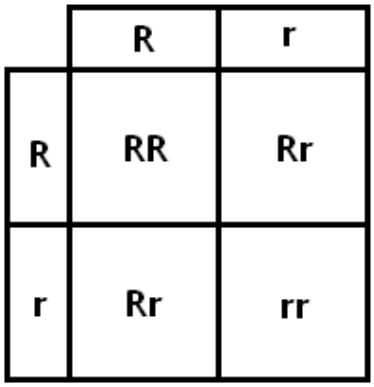
Question number	Answer	Mark
4(b)(i)	B	**(1)**

Question number	Answer	Mark
4(b)(ii)	Any two of the following points: • similar BMI (1) • same gender profile (1) • similar amount (and type) of exercise (1)	**(2)**

Question number	Answer	Mark
4(b)(iii)	An answer that combines the following points to provide a plan: • weigh the 40 obese people (1) • half follow the new diet and half keep their normal diet (1) • after a fixed time period re-weigh the 40 people (1)	**(3)**

Question Number	Answer	Acceptable answers	Mark
5(a)	Genus; Species;	Must be in the correct order	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(b)	A suggestion including the following points: • rats with the mutation survive to reproduce (1) • pass on the allele which makes the offspring resistant to warfarin (1)	 accept breed / produce offspring etc for reproduce accept gene / mutation for allele	**(2)**

Question Number	Answer	Acceptable answers	Mark
5(c)	 Correct gametes (1) Correct offspring (1)	If incorrect gametes are entered into the Punnett square but the offspring for those gametes are correct 1 mark can be awarded as an error carried forward	**(2)**

Question Number		Indicative Content	Mark
QWC	**5(d)**	A explanation to include some of the following points • MRSA is a bacterial infection • number of cases increased from 1995 to 2006 • MRSA is resistant to antibiotics • so MRSA infection not easy to treat • number of cases were similar between 2005 and 2007 • antiseptics killed the bacteria • less bacteria were transferred from person to person • number of cases decreased from 2007 • antiseptics kill bacteria on surfaces • causing less infections from MRSA	**(6)**
Level		No rewardable content	
1	**1 – 2**	• a limited explanation of the graph including correct data reading or the use of antiseptics or antibiotics to kill bacteria/treat MRSA • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 – 4**	• a simple explanation of one trend of the graph including correct data reading and the effect of the use of antiseptics or antibiotics to kill bacteria/treat MRSA • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 – 6**	• a detailed explanation of at least two trends of the graph linking it to antibiotic resistance and antiseptic programme • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

(Total for question 5 = 12 marks)