PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

BIOLOGY



MARK SCHEME

TOPIC 5: HEALTH, DISEASE AND THE DEVELOPMENT OF MEDICINES (PAPER 1, PACK 2)

SCORE	PERCENTAGE
/29	%

STEMUP

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Mark Scheme

Q1.

Question number	Answer	Additional guidance	Mark
	Any one from: • mammals may be harmed • drugs may affect other mammals in a different way(1)	other mammals systems work in a different way from humans	**(1)**

Q2.

Question Number	Answer	Additional guidance	Mark
(i)	Any two from: • wash hands after contact (1) • avoid direct contact / wear {gloves/protective clothes} (1) • wear a (protective) mask (1) • **sterilise** equipment {before /after} use (1)	 accept hand gels accept protect your face be immunised (1)	**(2)** AO 2 2

Question Number	Answer	Additional guidance	Mark
(ii)	subtraction 5943 - 2830 = 3113 (1) 3113 ÷2830 x 100 = 110 %	accept 5943 - 2830 ÷ 2830 award full marks for correct numerical answer without working accept other valid methods for the calculation	**(2)** AO 2 1

Question Number	Answer	Mark
(iii)	A it does not have flagella **1. The only correct answer is A** ***B** is not correct because plasmids do not allow motility.* ***C** is not correct because it does have ribosomes.* ***D** is not correct because acrosomes are not found in bacteria.*	**(1)** AO 2 1

Q3.

Question Number	Answer	Mark
	D testing using cultured cells → testing in healthy volunteers → double blind trials on patients **1. The only correct answer is D** ***A*** *is not correct because the medicine is tested on cultured cells first.* ***B*** *is not correct because double blind trials are used after testing in healthy volunteers.* ***C*** *is not correct because the medicine is tested on cultured cells first.*	**(1)** AO 1 1

Q4.

Question number	Answer	Mark
	C mass and height **The only correct answer is C** ***A*** *is not correct because waist circumference is not used to calculate BMI* ***B*** *is not correct because neither waist circumference nor hip circumference are used to calculate BMI* ***D*** *is not correct because hip circumference is not used to calculate BMI*	**(1)** AO1(1)

Q5.

Question number	Answer	Mark
	C white blood cell **The only correct answer is C** ***A is not correct because the HIV virus does not destroy red blood cells*** ***B is not correct because the HIV virus does not destroy nerve cells*** ***D is not correct because the HIV virus does not destroy sperm cells***	**(1)** **AO1 1**

Q6.

Question Number	Answer	Acceptable answers	Mark
(a)(i)1	immune (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(i)2	memory lymphocytes (1)		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(ii)	**B** hybridomas		**(1)**

Question Number	Answer	Acceptable answers	Mark
(a)(iii)	**Two** of the following: pregnancy testing (1) locating the position of blood clots (1) locating the position of cancers (1)	 accept detecting blood clots accept detecting cancer cells	 **(2)**

Question Number	Answer	Acceptable answers	Mark
(b)(i)	A comparison including two from: first response • delay in production of antibodies (1) • less antibodies produced (1) • production of antibodies slower (1)	or a second response • no delay in production of antibodies (1) • more antibodies produced (1) • production of antibodies faster (1) accept comparisons of data ignore references to decrease in antibody number	**(2)**

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	faster recovery / {no/less} symptoms of infection / increased chance of survival / kills pathogen faster(1)	accept more memory lymphocytes produced/ immune / fights infection faster	**(1)**

Question Number	Answer	Acceptable answers	Mark
(b)(iii)	**B** Edward Jenner		**(1)**

Q7.

Question Number	Answer	Additional Guidance	Mark
(i)	Any **two** from: • wear gloves (1) • clean the area of skin where blood being removed (1) • cover the wound after (1) • use a sterile needle (1)	 accept wash hands / wear a mask accept disinfect / clean the wound ignore clean accept sit the person down (1) ignore references to removing the correct volume of blood	**(2)** **AO2 2**

Question Number	Answer	Additional Guidance	Mark
(ii)	• heterozygous An explanation linking: • affected offspring must have inherited the recessive allele (1) • unaffected offspring must have inherited dominant allele (1)	accept carrier / dominant and recessive allele / Hh accept one offspring is homozygous recessive accept one / two offspring are homozygous dominant accept a **labelled** Punnett square for any mark point	**(3)** **AO3**

Q8.

Question number	Answer	Mark
(i)	B	(1)

Question number	Answer	Mark
(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
(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)

Q9.

	Answer	Acceptable answers	Mark
(i)	An explanation linking **two**of the following: • tobacco contains tar (1) • tobacco/tar contains carcinogens / causes mutations /is cancer forming (1) • nicotine in tobacco is addictive which makes it difficult to give up /causes people to smoke for longer (1)		**(2)**
(ii)	**A** ☒ carbon monoxide		**(1)**

Q10.

	Answer	Acceptable answers	Mark
	An explanation including **three**of the following**:**	Accept increases neurotransmitters	**(3)**

	• (stimulants) act at the synapse (1) • **more**neurotransmitters (1) • so speeds up neurotransmission(1)	Accept decreases reaction time/speeds up reactions/ speeds up brain activity	

Q11.

	Answer	Acceptable answers	Mark
(i)	**C** ☒ parasite		**(1)**
(ii)	A suggestion linking **two of the following:** • suckers on the head /adaptation of the head (1) • attaches to the intestine (1) OR • a very long thin shape / large surface area (1) • for absorption (1) OR • surface / skin (1) • resistant to enzymes (1)	Accept hooks, teeth for suckers Reject large intestine Accept long flexible shape Ignore references to resistance to stomach acid Ignore references to larvae, eggs and reproduction	**(2)**
(iii)	A suggestion including two of the following: • cooking meat thoroughly (1) • do not eat meat /become a vegetarian / vegan(1) • destroy/don't eat the cysts in the meat(1) • prevent animals from eating tapeworm eggs (1) • worm the animal (1)	Accept food/pork for meat	**(2)**

Q12.

	Answer	Acceptable answers	Mark
	A ☒antigens		**(1)**

Q13.

	Answer	Acceptable answers	Mark
(i)	the later that a person gives up smoking/the longer you smoke for the higher risk of lung cancer	ORA	**(1)**
(ii)	9 (%)		**(1)**
(iii)	$\frac{500\,000 \times 9}{100}$ (1) = 45 000 (1)	2 marks for the correct bald answer if value other than 9 (2 – 14) inserted into correct equation ecf applies if calculation is correct	**(2)**

Q14.

	Answer	Acceptable answers	Mark
(a)(i)	**C** ☒ parasite		**(1)**
(a)(ii)	A suggestion linking **two of the following:** • suckers on the head /adaptation of the head (1) • attaches to the intestine (1) OR • a very long thin shape / large surface area (1) • for absorption (1)	Accept hooks, teeth for suckers Reject large intestine Accept long flexible shape Ignore references to resistance to stomach acid	**(2)**

	OR • surface / skin (1) • resistant to enzymes (1)	Ignore references to larvae, eggs and reproduction	
(a)(iii)	A suggestion including two of the following: • cooking meat thoroughly (1) • do not eat meat /become a vegetarian / vegan(1) • destroy/don't eat the cysts in the meat(1) • prevent animals from eating tapeworm eggs (1) • worm the animal (1)	Accept food/pork for meat	**(2)**
(b)	An explanation including **three**of the following: • (chemosynthetic) bacteria live in (the gut of) the tube worms (1) • the bacteria convert sulphurous / hydrogen sulphide compounds (1) • into food for the tube worms (1) • the tube worms provide place for the bacteria to live / provides oxygen for bacteria (1) • this is a mutualistic relationship (1)	**Accept sulphur** Accept bacteria make food for worms **Accept protection** Accept mutualism / mutual benefit / mutual relationship	**(3)**