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Mark Scheme (RESULTS)
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GCE

GCE Biology (6105/01)

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Question Number	Answer	Mark
1 (a)	(biotype) B ;	**1**

Question Number	Answer	Mark
1 (b)	1. (populations of biotype A and B) are separated by {behavioural / reproductive / physiological} isolation ; 2. isolation described e.g. mate at different times ; 3. no gene flow between the populations / each population genetically isolated ; 4. natural selection described e.g. biotype B flies with the gene for resistance to insecticide survive ; 5. the two gene pools become different / eq ; 6. reference to sympatric speciation ;	**max 4**

Question Number	Answer	Mark
1 (c)	1. reference to resistance to insecticides ; 2. no contamination (by chemicals) ; 3. no need to reapply / it is longer lasting / reference to resurgence ; 4. correct reference to specificity of control ; 5. reference to organic status ;	**max 3**

Question Number	Answer	Mark
2 (a)	A = reverse transcriptase ; B = DNA polymerase ;	**2**

Question Number	Answer	Mark
2 (b)	1. plasmid {opened / cut / eq} using {endonuclease / eq} ; 2. reference to sticky ends ; 3. (ends of) DNA complementary to plasmid /eq ; 4. joins by hydrogen bonding ; 5. correct reference to (DNA) ligase / formation of phosphodiester bonds ;	**max 3**

Question Number	Answer	Mark
2 (c)	1. idea of marker gene ; 2. (marker gene) {fluorescence / can be for antibiotic resistance / eq} ;	**2**

Question Number	Answer	Mark
3 (a)(i)	1. idea of both alleles (in heterozygote) contributing (equally) to expression (in phenotype) ; 2. { I^A / allele for A} is codominant with { I^B / allele for B} / I^A and I^B are both dominant over I^O ;	**2**

Question Number	Answer	Mark
3 (a)(ii)	1. idea of more than two alleles available at a locus ; 2. idea of three alleles in blood grouping / reference to I^A, I^B or I^o being available ;	**max 1**

Question Number	Answer	Mark
3 (b)(i)	C1 = $I^A I^B$ C2 = $I^B I^O$ C3 = $I^A I^B$;	**1**

Question Number	Answer	Mark
3 (b)(ii)	1. $I^O I^O$ is identified as O group blood ; 2. {$I^A I^O$ / **Ao** / **AO**} and {$I^B I^O$ / **Bo** / **BO**} ; 3. gametes from each parent shown correctly ; 4. correct use of diagram or Punnett square to show possible combinations of offspring genotypes ; 5. (this gives) one in four chance / eq ;	**max 4**

Question Number	Answer	Mark
4 (a)(i)	2250 – 240 ; (2010 / 2250 x 100 =) 89.3 ;	 **2**

Question Number	Answer	Mark
4 (a)(ii)	1. not all the primary consumer is eaten / some die and are not eaten / eq ; 2. some (of the eaten primary consumers) {undigested / egested / lost as faeces / eq} ; 3. losses from respiration / eq ; 4. loss from {excretion / urine / urea / eq} ;	**max 2**

Question Number	Answer	Mark
4(b)	1. blue and red light absorbed ; 2. (blue and red) absorbed by chlorophyll ; 3. blue light absorbed by carotene ; 4. green light reflected / eq ;	**max 3**

Question Number	Answer	Mark
4 (c)	1. acid rain {damages / eq} cuticle of leaves / damage to guard cells ; 2. causes plants to transpire more / more stressed in drought / eq ; 3. causes {leaf drop / die back / crown loss / eq} ; 4. less photosynthesis / reduced surface area for absorbing light ; 5. damages root hairs ; 6. plants unable to absorb as much {water / nutrients / minerals / eq} ;	**max 4**

Question Number	Answer	Mark
5 (a)(i)	A = (mono)nucleotide ;	**1**

Question Number	Answer	Mark
5 (a)(ii)	1. phosphate 2. deoxyribose 3. {nitrogenous / organic} base / eq ;; [3 correct = 2 marks, 2 correct = 1 mark]	**2**

Question Number	Answer	Mark
5 (b)(i)	{inter / synthesis / S} (phase) ;	**1**

Question Number	Answer	Mark
5 (b)(ii)	1. reference to each strand as template (for synthesis of new strands) ; 2. idea that each {daughter / eq} molecule contains one of the {parental / eq} DNA strands ; 3. and one new strand ;	**max 2**

Question Number	Answer	Mark
5 (b)(iii)	1. enzyme ; 2. ref to {links nucleotides / formation of phosphodiester bonds / eq} ; 3. to form new strand / eq ; 4. use of {ATP / GTP / CTP / TTP} ;	**max 2**

Question Number	Answer	Mark
5 (c)	(mitosis) 1. reference to any of the following events not occurring ; 2. allele sequence unchanged (on daughter chromosomes) ; (meiosis) 3. reference to {chromosome pairing / formation of bivalents} ; 4. during prophase 1 ; 5. reference to exchange of {alleles / genetic material} ; 6. idea of recombinant {chromatids / chromosomes} formed / new sequences of alleles ;	**max 4**

Question Number	Answer	Mark
6 (a)(i)	1. recognisable as synapse ; 2. two correct pairs of labels ;;	**3**

Question Number	Answer	Mark
6 (a)(ii)	(mitochondria) 1. release energy / produce ATP / through aerobic respiration / oxidative phosphorylation ; 2. energy used in active transport / synthesis of transmitter substance / movement of vesicles ; (synaptic vesicles) 3. contain {transmitter / named transmitter} ; 4. fuse with pre-synaptic membrane / releases transmitter (into synapse);	**max 3**

Question Number	Answer	Mark
6 (b)	1. into blood stream ; 2. through {skin / alveoli / nose / mouth / eq} ; 3. (carried) in the plasma ; 4. correct reference to diffusion of nicotine ; 5. (diffusion from blood) into tissue fluid / eq ; 6. nicotine mimics acetylcholine / eq ; 7. binds to receptors / eq ; 8. on post-synaptic membrane ; 9. it causes the release of adrenalin in some synapses ;	**max 6**

Question Number	Answer	Mark
7 (a)	{α / alpha} ;	**1**

Question Number	Answer	Mark
7 (b)	1. idea of making molecule {more reactive / able to react more easily} ; 2. by lowering activation energy ; 3. maintains concentration gradient / prevents loss of glucose from cell ;	**max 2**

Question Number	Answer	Mark
7 (c)	{pyruvate / pyruvic acid} ATP {NADH / reduced NAD / eq} ;; [3 correct = 2 marks, 2 correct = 1 mark]	**2**

Question Number	Answer	Mark
7 (d)(i)	1. binds to {hexokinase / enzyme} {not at active site / at allosteric site} ; 2. changes shape of active site ; 3. glucose no longer fits / eq ; 4. idea of more molecules of glucose-6-phosphate (as concentration increases) ; 5. causes more molecules of enzyme to be inhibited ;	**max 3**

Question Number	Answer	Mark
7 (d)(ii)	1. {reaction / phosphorylation of} glucose {slows down / stopped} ; 2. glucose remains in {cytoplasm / cell} / glucose not removed from {cytoplasm / cell} ; 3. as (more) glucose diffuses into {cytoplasm / cell}, concentration increases ; 4. diffusion {stops / slows down} because {equilibrium has been reached / no concentration gradient / eq} ;	**max 3**

PAPER TOTAL: 70 MARKS