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Mark Scheme (RESULTS)
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GCE

GCE Biology (6103/03)

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Question Number	Answer	Mark
1 (a)(i)	1. reference to external digestion /eq ; 2. feed on organic material / both are heterotrophic /eq ; 3. reference to hypha(e) {secrete / eq} enzymes / absorb {digested products / named product} / eq ;	**max 2**

Question Number	Answer	Mark
1 (a)(ii)	1. (*Rhizopus*) is {saprobiontic / saprophytic} / eq ; 2. (*Rhizopus*) {feeds on / eq} {dead / eq } material ; 3. reference to importance of *Rhizopus* as {a decomposer / involved in recycling of nutrients} and *Phytophthora* causing {harm / loss of crops / eq} ;	**max 2**

Question Number	Answer	Mark
1 (b)	1. {less / eq} photosynthesis possible ; 2. (because) {leaves / palisade cells / photosynthetic cells / chloroplasts} damaged / eq ; 3. less {glucose / starch / organic compounds} produced /eq / idea of fungus using up the plants' organic material ; 4. reference to {blocked stomata / inefficient gas exchange / eq} ;	**max 2**

Question Number	Answer	Mark
2 (a)	1. bacteria / fungi / saprophyte / saprobiont / decomposer / suitable, correct organism ; 2. reference to respiration ;	**2**

Question Number	Answer	Mark
2 (b)(i)	photosynthesis ;	**1**

Question Number	Answer	Mark
2 (b)(ii)	1. reference to respiration (of some of the organic material) ; 2. idea that energy is required ; 3. for synthesis of {molecules / eq} / movement / active transport} ;	**max 2**

Question Number	Answer	Mark
2 (c)	1. idea of {carbon / carbon dioxide} {locked away / stored} / eq ; 2. for {many years / a long time / eq} ;	**2**

Question Number	Answer	Mark
2 (d)	24 391 ÷ 37.98 ; 642.2 x 10^6 ha ;	**2**

Question Number	Answer	Mark
2 (e)	1. (different) {climates / rainfall / temperatures / eq} ; 2. (different) {species / types} of {tree / forest} ; 3. (different) {ages / maturity / size / eq} of forests ; 4. (different) tree density / number of trees ; 5. reference to (different) day lengths ; 6. reference to (different) light intensity ; 7. (different) carbon dioxide concentration / eq ; 8. any two other valid reasons ;;	**max 2**

Question Number	Answer	Mark
2 (f)	1. idea of less carbon dioxide {fixed / taken up / eq} by photosynthesis ; 2. {respiration / combustion of {fossil fuels / trees}} continues to release carbon dioxide ; 3. carbon dioxide builds up in {upper atmosphere / troposphere} ; 4. reference to carbon dioxide as greenhouse gas ; 5. description of the greenhouse effect ; 6. reference to {enhanced / eq} greenhouse effect ; 7. reference to global warming / increase in mean temperature (of Earth's surface) ;	**max 4**

Question Number	Answer	Mark
3 (a)(i)	{total biomass / eq} produced / {total energy / eq} taken in ; by {plants / producers / photosynthesis / eq} ;	**2**

Question Number	Answer	Mark
3 (a)(ii)	1. light intensity ; 2. light duration / eq ; 3. light wavelength ; 4. temperature ; 5. {carbon dioxide / carbonate} concentration ; 6. pH ; 7. named aquatic pollutant ;	**max 2**

Question Number	Answer	Mark
3 (b)	1. (dead plant material) is decomposed / eq ; 2. by action of {bacteria / microoorganisms / eq} ; 3. idea that aerobic respiration involved ; 4. (more) dead material provides more nutrients which leads to an increase in microorganisms / eq ;	**max 3**

Question Number	Answer	Mark
3 (c)(i)	1. CR in winter {usually greater/eq} than in summer ; 2. both show increase as distance (from headwaters) increases ; 3. in winter CR increases {greatly / eq}, in summer only {slight increase / eq} ; 4. use of manipulated data ;	**max 2**

Question Number	Answer	Mark
3 (c)(ii)	1. idea that {more leaves / detritus / eq} added with distance from source / more leaves shed in winter / (more dead material because) algae die down in winter ; 2. far increased {bacterial / eq} activity ;	**2**

Question Number	Answer	Mark
3 (d)(i)	1. GPP {increases as distance (from headwaters) increases / higher in Motueka River} ; 2. high GPP indicates {high algal population / eq} ; 3. (because) algae release oxygen by photosynthesis ; 4. more algae means more {grazing invertebrates / eq} ; 5. more food (for fish / trout) ;	**max 3**

Question Number	Answer	Mark
3 (d)(ii)	1. CR {higher / increases} (in winter) ; 2. (higher CR indicates) more {detritus / eq} ; 3. {algae / eq} may die down in winter ; 4. reference to {decay / eq} (of detritus and/or algae) uses up oxygen ; 5. fish population {falls / eq} ;	**max 3**

TOTAL FOR PAPER: 38 MARKS