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***PLEASE can you mark this worksheet as accurately as possible

Question 1 [18]

1. Allopatric speciation is the development of a new species due to geographic, (elaboration of geographic) isolation of populations of a species/ group / leads to reproductive isolation. (3)

2. (Group A) – The blesbok group has a higher rate of speciation and extinction than the impalas (B). (4)

3. (a) Since the blesbok group are specialised feeders; they will eat only select food in a particular habitat. (The area where preferred food is scarce/absent functions as a geographic barrier.) This means they will not establish populations in all habitats so populations become isolated in area (geographic isolation) and inbreeding will eventually separate one group from another and each group will develop its own variations different from other groups. Diet speciality has caused more macroevolution in the blesbok group. Less competition therefore more ecological niches Any 4 points (4)

(b) Since all the buck have different preferences for food, each type can occupy a lot of different habitats/or the same habitat; and competition for food/habitat (cannot just mention survival) is reduced. (2)

(c) The ancestral finch/ tortoise species reached one of the Galapagos Islands where the population adapted to the local environment. Some finches flew to a neighbouring island. The different populations of finch all have evolved different beaks in association with different diet on the islands and living in different niches. With time, the island populations became so different from each other that 13 species arose. The geographic/sea barrier/ separated because on different islands/ between the populations assist this process. Any 5 points (5)

Question 2 [30]

1. A species is a group of individuals capable of interbreeding; to produce fertile offspring; a group of individuals with a common ancestry; that closely resemble each other. (Any 3 or explanation related to niches) (3)
2. head shape; eye position; fin shape/size; /scale size; lips thickness; barbell (whisker) structure; mouth shape. (Any 3 features × 2 marks) (6)
3. The common ancestor; of the KwaZulu yellowfish are geographically isolated/ separated from Clanwilliam yellowfish; as the rivers are not connected. Mutations occur over time; so that eventually the two types could not interbreed; and became two different species. (5)
 - a) Largemouth yellowfish; smallmouth yellowfish (2)
 - b) The largemouth yellowfish eats insects, crabs, fish; the smallmouth eats insects, clam, vegetation, algae (2)
 - c) Different breeding times ; largemouth breeds in mid to late summer and smallmouth breeds in spring to mid-summer. Or occupy different niche; different diet; different habitat (with expansion of idea) (4)
5. Biodiversity maintained for future generations; food supply increase/angling/ edible/recreation/aquaculture (fish farming) (Any 2) (2)
6. For example: Galapagos finches – with different beaks; to eat different diets; found on the different islands. Or other example. (3)
7. Yellowfish have different head shapes/mouths; to feed on different diets; available in different rivers/or other relevant example that links to 6. (3)

Question 3 [6]

1. A single species evolved into many species. Their mouths changed shape as they ate different food sources /to suit the type of food they were now eating/exposed to different food sources /competition between cichlids. (3)
 - 2 (a) Prevents breeding/mating between new and parent population.
OR Prevents gene flow between populations. (1)
 - (b) Sympatric (1)
- Cichlids were not separated by any geographical barrier.
- OR Cichlids were separated by different food niches in the same area/ lake. (1)

MEMO

Life Science 12

Week 17

Question 4 [5]

1. they are different/not the same/different (male reproductive organ) structures/(species 1 to 6 have) different shapes/morphological difference/ won't fit with female/male and female won't fit/pre-zygotic isolation/ morphological difference (1)

2. can only mate/produce offspring/reproduce penis/reproductive organs only fits/matches different genitalia, fit/matches different female structures different shaped reproductive organs with female of same species different shaped penis/prevents locking AND with female of same species not with female of other species within species/it is species specific/between 6 different types/groups (2)

3. damselflies not separated by geographical barriers physical barriers live in same area AND separated by their physical features/different genitalia/body structure different; cannot physically reproduce/interbreed (offspring with other species); (speciation owing to) reproductive isolation/prezygotic isolation/ mechanical isolation (2)

[Total: 59 Marks]