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Province of the

**EASTERN CAPE**

EDUCATION

**NATIONAL**

**SENIOR CERTIFICATE**

**GRADE 11**

**NOVEMBER 2010**

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| **LIFE SCIENCES – PAPER 2**  **MEMORANDUM** |

**MARKS: 150**

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| This memorandum consists of 11 pages. |

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| --- | --- | --- | --- |
| **SECTION A** | | |  |
|  | | |  |
| **QUESTION 1** | | |  |
|  |  |  |  |
| 1.1 | 1.1.1 | B **🗸🗸** |  |
|  | 1.1.2 | B **🗸🗸** |  |
|  | 1.1.3 | A **🗸🗸** |  |
|  | 1.1.4 | D **🗸🗸** |  |
|  | 1.1.5 | C **🗸🗸**  (5 x 2) | (10) |
|  |  |  |  |
| 1.2 | 1.2.1 | Planktons (zooplanktons/phytoplanktons) **🗸** |  |
|  | 1.2.2 | Pathogen **🗸** |  |
|  | 1.2.3 | Sporangiophore **🗸** |  |
|  | 1.2.4 | Window period **🗸** |  |
|  | 1.2.5 | Plasmodium vivax/plasmodium **🗸** (5 x 1) | (5) |
|  |  |  |  |
| 1.3 | 1.3.1 | A only **🗸🗸** |  |
|  | 1.3.2 | B only **🗸🗸** |  |
|  | 1.3.3 | None **🗸🗸** |  |
|  | 1.3.4 | A only **🗸🗸** |  |
|  | 1.3.5 | Both A and B **🗸🗸** (5 x 2) | (10) |
|  |  |  |  |
| 1.4 | 1.4.1 | PLANT 1 – Bryophyta **🗸** |  |
|  |  | PLANT 2 – Pteridophyta **🗸** |  |
|  |  | PLANT 3 – Gymnosperm **🗸** |  |
|  |  | PLANT 4 – Angiosperm **🗸** | (4) |
|  |  |  |  |
|  | 1.4.2 | A − Poorly developed, no xylem and phloem **🗸** |  |
|  |  | B − Xylem and phloem present **🗸** |  |
|  |  | C − No real root, stem or leaves. The plant body is a thallus **🗸** |  |
|  |  | D – Spores **🗸** |  |
|  |  | E − Male and female cones with exposed seeds **🗸** | (6) |
|  |  | F − No water needed for fertilisation **🗸** |  |
|  |  |  |  |
| 1.5 | 1.5.1 | Female anopheles mosquito **🗸** | (1) |
|  | 1.5.2 | The larval stage **🗸** | (1) |
|  | 1.5.3 | They became immune to the DDT and Dieldrin **🗸** | (1) |
|  | 1.5.4 | Producers **🗸** | (1) |
|  | 1.5.5 | They are non-biodegradable **🗸**and toxic **🗸** | (2) |
|  | 1.5.6 | Biological control **🗸** | (1) |

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|  | 1.5.7 | * Remaining indoors during dark **🗸** * Wearing long-sleeved clothes, long trousers and socks **🗸** * Keeping windows and doors closed at night or protecting the areas with screens **🗸** * Sleeping under a mosquito net **🗸** * Using mosquito mats or burning mosquito coils to keep the mosquitoes away **🗸** * Treating clothing with approved insecticides **🗸** * Applying an insect repellent to exposed skin; avoid contact with lips, eyes, sun burnt or damaged skin **🗸**  (Any 3 x 1) | (3) |
|  |  |  |  |
| 1.6 | 1.6.1 | Anaerobic respiration/ alcoholic fermentation **🗸** | (1) |
|  |  |  |  |
|  | 1.6.2 | Fungi **🗸** | (1) |
|  |  |  |  |
|  | 1.6.3 | * As a source of food. e.g. mushrooms **🗸** * Production of antibiotics. e.g. penicillin production **🗸** * Baking industry. e.g. yeast is used in bread making **🗸** * Sewage disposal – decomposition of organic wastes **🗸** * Leather industry – tanning of animal hides **🗸** * Cheese production. e.g. Roquefort **🗸** (Any 3 x 1) | (3) |
|  |  |  |  |
|  |  | **TOTAL SECTION A:** | **50** |

|  |  |  |  |
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| **SECTION B** | | |  |
|  |  |  |  |
| **QUESTION 2** | | |  |
|  |  |  |  |
| 2.1 | 2.1.1 | A − Humerus **🗸** |  |
|  |  | B − Radius **🗸** |  |
|  |  | C − Ulna**🗸** |  |
|  |  | D − Carpals**🗸** |  |
|  |  | E − Metacarpals**🗸** and phalanges**🗸** | (6) |
|  |  |  |  |
|  | 2.1.2 | 1 − Running**/** walking/ jumping **🗸** |  |
|  |  | 2 − Swimming **🗸** |  |
|  |  | 3 − Digging **🗸** | (4) |
|  |  | 4 − Flying **🗸** |  |
|  |  |  |  |
|  | 2.1.3 | 3 − The humerus, radius and Ulna are short and strong for digging **🗸**  An enlarged displaced carpal has formed to assist with digging **🗸** |  |
|  |  | 4 − The phalanges and metacarpals are modified for flight purposes **🗸**  The phalanges are elongated to form the wing. **🗸** | (4) |
|  |  |  |  |
|  | 2.1.4 | The basic body plan becomes modified as an animal becomes adapted to a particular way of life. **🗸** | (1) |
|  |  |  |  |
|  | 2.1.5 | All the organisms with a common body plan were descended from a common ancestor. **🗸** | (1) |
|  |  |  |  |
| 2.2 | 2.2.1 | Salt water fish **🗸** | (1) |
|  |  | They are found in the largest habitat **🗸**  They are well adapted to live in a habitat with environmental variations**🗸** e.g. light, temperature, chemical and pressure variations. (Any 1 x 1) | (1) |
|  |  |  |  |
|  | 2.2.2 | Salt water covers a larger surface area than the fresh water **🗸**  Human activities have had a lesser impact on sea water **🗸** (Any 1 x 1) | (1) |
|  |  |  |  |
|  | 2.2.3 | * Emigration **🗸** * Plant succession **🗸** * Disease **🗸** * Climate change **🗸** * Habitat destruction by humans **🗸** * Pollution **🗸** * Alien species invasion **🗸** * Over exploitation of the environment **🗸** * Natural disasters **🗸** (Any 5 x 1) | (5) |

|  |  |  |  |  |  |
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|  | 2.2.4 | **GROUP OF ORGANISMS** | | **NUMBER OF SPECIES** |  |
|  |  | Mammals | | 250 |  |
|  |  | Birds | | 800 |  |
|  |  | Salt water fish | | 2000 |  |
|  |  | Fresh water fish | | 200 |  |
|  |  | Reptiles | | 350 |  |
|  |  |  | | |  |
|  |  | **Rubric**  Caption: The number of species in the different groups of animals found in South Africa | | |  |
|  |  | Caption | 1 mark | |  |
|  |  | Column headings | 1 mark | |  |
|  |  | Row headings | 1 mark | |  |
|  |  | 3 – 5 correct readings | 2 marks | |  |
|  |  | Draw table | 1 mark | | (6) |
|  |  |  |  | | **[30]** |
|  |  |  | | |  |
| **QUESTION 3** | | | | |  |
|  |  |  | | |  |
| 3.1 | 3.1.1 | A − Coelenterata **🗸** | | |  |
|  |  | B − Porifera **🗸** | | |  |
|  |  | C − Annelida **🗸** | | | (3) |
|  |  |  | | |  |
|  | 3.1.2 | A − Jellyfish **🗸** | | | (2) |
|  |  | B − Sponge **🗸** | | |  |
|  |  |  | | |  |
|  | 3.1.3 | * Radially symmetrical * Diploblastic (two cell layers) **🗸** * No coelom **🗸** * Single opening to the gut **🗸** * Mesogloea present **🗸** (Any 3 x 1) | | | (3) |
|  |  |  | | |  |
|  | 3.1.4 | B **🗸**, A, **🗸** C **🗸** (marks subtracted if not in the correct sequence) | | | (3) |

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|  | 3.1.5 | C:\Users\Sunil George\Desktop\scan0021.tif | |  |
|  |  |  | |  |
|  |  | **Rubric** | |  |
|  |  | Caption | 1 mark |  |
|  |  | Correct proportions | 1 mark |  |
|  |  | Any 5 labels | 5 marks | (7) |
|  |  |  |  |  |
| 3.2 | 3.2.1 | The ratites lack a keel bone **🗸** on to which flight muscles normally  attach. **🗸** | | (2) |
|  |  |  | |  |
|  | 3.2.2 | 5 **🗸** − Moa **🗸** | | (2) |
|  |  |  | |  |
|  | 3.2.3 | Godwanaland **🗸** | | (1) |
|  |  |  | |  |
|  | 3.2.4 | South America, Africa, Australia and New Zealand were all once joined and made up Godwanaland **🗸** | | (1) |
|  |  |  | |  |
|  | 3.2.5 | The birds share similar body features (plans) **🗸**/ resemble each other; have similar mode of life on each land mass. **🗸**  (Any 1 x 1) | | (1) |
|  |  |  | |  |
|  | 3.2.6 | Africa − Ostrich **🗸**  South America − Rhea**🗸** | | (2) |
|  |  |  | |  |
|  | 3.2.7 | Many ratites lived on isolated islands where there were no predators**🗸**. Flight was not an important feature for the survival**🗸**since there were no predators. Therefore, over a period of long time, other adaptive traits**🗸** were favoured by natural selection. **🗸** These species evolved by developing an ability to run fast **🗸** and defend themselves by kicking with their clawed feet. **🗸** (Any 3 x 1) | | (3) |
|  |  |  | | **[30]** |
|  |  |  | |  |
|  |  | **TOTAL SECTION B:** | | **60** |

|  |  |  |  |
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| **QUESTION 4** | | |  |
|  |  |  |  |
| 4.1 | 4.1.1 | A vaccine is a substance that is injected in to the body or given orally to prevent a specific disease. **🗸** | (1) |
|  |  |  |  |
|  | 4.1.2 | A weakened form of disease causing organism(s). **🗸** | (1) |
|  |  |  |  |
|  | 4.1.3 | When a person is injected with a weakened **🗸** (mild) form of disease causing organisms, the immune system gets activated **🗸** and responds to the threat by producing large number of antibodies **🗸** against the disease and those antibodies remain **🗸** in the body for a reasonable period of time offering protection against the disease. **🗸** (Any 2 x 1) | (2) |
|  |  |  |  |
|  | 4.1.4 | The disease causing bacteria are completely destroyed**🗸** by the antibodies that existed **🗸** in the body as a result of vaccination. The antibodies protect **🗸** the person from contracting cholera. (Any 2 x 1) | (2) |
|  |  |  |  |
|  | 4.1.5 | Acquired immunity **🗸** | (1) |
|  |  |  |  |
|  | 4.1.6 | * Improve sanitation **🗸** * Improve quality of water sources/improve quality of drinking   water **🗸**   * Improve, maintain and monitor the sewage systems on a regular basis **🗸** * Educate people **🗸** * Introduce heavy penalties or fines for dumping organic and other waste in water sources **🗸** (Any 3 x 1) | (3) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4.2 | 4.2.1 |  | |  |
|  |  |  | |  |
|  | **Rubric for the mark allocation of the graph** | | |  |
|  | Correct type of graph | | 1 mark |  |
|  | Caption | | 1 mark |  |
|  | Correct proportions of slice | | 1 mark for the general proportion (at a  glance) |  |
|  |  | | 2 marks for accurate proportion in  pie chart |  |
|  | Label / key for each slice | | 2 mark for 1 – 3 labels |  |
|  |  | | 3 marks for 4 – 6 labels | (7) |
|  |  |  | |  |
|  | 4.2.2 | 39,43 million **🗸** | | (1) |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 4.2.3 | * It is easy to identify an infected person at first sight **🗸** * Married people will not contract this disease **🗸** * It is a racially biased fiction; not real **🗸** * Only homosexual men are affected **🗸** * Traditional healers can successfully heal this condition **🗸** * Promoting condoms is the only strategy to reduce the size of the population of certain racial groups **🗸** * HI virus can be destroyed if they have sexual intercourse with under-aged girls **🗸** * Shaking hands with a HIV positive person is a health risk **🗸** * Sharing towels, baths, toilets, swimming pools with an infected person is highly risky **🗸** * AIDS can be transmitted by mosquitoes **🗸** * Any other relevant answer (Any 2 x 1) | (2) |
|  |  |  |  |
| 4.3 | 4.3.1 | A − point of divergence **🗸** − nature selects the best adapted individuals that are fit to survive in that particular condition/species become adapted to function in different environment**. 🗸** | (2) |
|  |  |  |  |
|  | 4.3.2 | Asian elephants are more closely related to mammoths than to African elephants **🗸/** African elephants evolved before Asian elephants from a common ancestor. **🗸**  (Any 1 x 1) | (1) |
|  |  |  |  |
|  | 4.3.3 | They all originated from a common ancestor **🗸** / The dassie is the African elephant’s closest living relative in spite of their size and other differences. **🗸** / Dassies and aardvarks evolved at the same time. **🗸** (Any 1 x 1) | (1) |
|  |  |  |  |
|  | 4.3.4 | * Climate change **🗸** (warmer climate might have led to the extinction of cold-adapted mammoths). * Human hunting **🗸** * Diseases**🗸** (increased microbial activity might have caused wide spread diseases) (Any 1 x 1) | (1) |

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| 4.4 | (a) | **Ecotourism**   * Ecotourism is mainly inclined to promote environmental awareness and instil a sense of appreciation of natural formations and   beauty. **🗸**   * It makes people respect the existence of other living organisms (fauna and flora) that shares the resources of the planet earth **🗸** * Its main clients are people who are interested in preserving the environment. **🗸** * A potential ecotourist prefers to spend his/her holidays in a natural environment to experience and be part of the environment **🗸** * They like to visit and spend time in quiet natural settings such as unspoiled beaches, river mouths, waterfalls, wet lands with lush green forests, gorges, mountains etc. **🗸** * Always prefer to use eco-friendly mode of transport to cause less pollution and damage to fauna and flora **🗸** * Encourages people to consume naturally grown, fresh produce from the area **🗸** * Greater emphasis is placed on the well-being of local people and constantly look for ways and means to contribute towards the local economy **🗸** * Eco-friendly accommodation is provided for visitors to minimise the possible human impact on the surrounding area **🗸** * Renewable energy is utilised wherever possible **🗸** (Any 4 x 1) | (4) |
|  |  |  |  |
|  | (b) | **Long term sustainability**   * Educate the local population about the importance of conserving the natural resources. **🗸** * The involvement of the local community should be prioritised. **🗸** * Active participation generates income for local communities. e.g. selling composts, organic food products. **🗸** * Job creation alleviates poverty. e.g. tour guides, security personnel, and creating opportunities to sell and exhibit art work. **🗸** * Ownership of the concept leads to proper caring and protection of the fauna and flora. e.g. prevention of poaching, illegal smuggling of exotic animals and plants, discourages over exploitation of natural resources. **🗸** * Part of the income generated can be utilised for conservation and rehabilitation projects. **🗸** * Cementing strong partnership with the private and public sector could provide more management and financial support **🗸**   (Any 4 x 1) | (4) |

|  |  |  |  |
| --- | --- | --- | --- |
|  | (c) | **Possible threats to ecotourism**   * Poaching / illegal hunting **🗸** * Crime and violence against tourists **🗸** * Pollution **🗸** * Illegal trade of exotic plants and animals **🗸** * Illegal occupation of land and the establishment of squatter camps **🗸** * Natural disasters. e.g. wild fires, droughts, floods, etc**. 🗸** * Deforestation **🗸** * Extension of farming lands **🗸** * Illegal dumping of waste **🗸** * Illegal developments **🗸** e.g. hotels and golf estates, airports, stadia. etc. * Building of dams in an ecologically sensitive area **🗸** * Mining **🗸** * Exploitation of tourists **🗸** (Any 4 x 1) | (4 ) |
|  |  |  |  |
|  | **Synthesis** | |  |
|  | **Marks** | **Descriptions** |  |
|  | 3 | Well structured – demonstrates understanding of questions |  |
|  | 2 | Minor gaps in the answer |  |
|  | 1 | Attempted but with significant gaps in the answer |  |
|  | 0 | Not attempted/ nothing written/ nothing correct other than question number |  |
|  |  |  |  |
|  |  | **TOTAL SECTION C:** | **40** |
|  |  |  |  |
|  |  | **GRAND TOTAL:** | **150** |