Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

OHS – Cambridge International Examinations

Subject:AICE Level BiologyDate: **\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| Self-Assess | Details |
|  | **Chapter 16 – Inherited Change Part III**  *This information is taken from Jones & Fosbery (JF) Ch 16 (4th Edition)*  Review the objectives for this chapter page 364 and make sure you place the section “O” in your notebook under that tab.  **Dihybrid Crosses**   * *Monohybrid crosses-* * *Dihybrid crosses (provide detailed explanation on looking at the inheritance of two genes at once and the example that is given in the book)* * *Independent assortment*  |  |  |  | | --- | --- | --- | | ***Parental Phenotypes*** |  |  | | ***Parental Genotypes*** |  |  | | ***Gametes*** |  |  |   *At fertilization, any of the four types of gametes from above (the heterozygous parent may fuse with the gametes from the homozygous parent) and the genotypes of the offspring will be (draw chart):*  *Results from above:*   |  |  |  | | --- | --- | --- | | ***Parental Phenotypes*** |  |  | | ***Parental Genotypes*** |  |  | | ***Gametes*** |  |  |   ***Offspring genotypes and phenotypes: Draw dihybrid cross below***  ***Results from above:***  **SAQ 16.16 (2 pts)**  **SAQ 16.17: Complete on spearate paper and attach to notes. (4 pts)**   1. AABb x aabb 2. GgHh x gghh 3. TTyy x ttYY 4. eeFf x Eeff   **SAQ 16.18 (2 pts)**      **SAQ 16.19 (6 pts)**  **SAQ 16.20 (2 pts)**  **[PA] use the chi-squared test to test the significance of differences between observed and**  **expected results (the formula for the chi-squared test will be provided);**  **The X2 (Chi-squared)test: Summarize in steps**  **SAQ 16.24 (5pts)**    (g) **explain, with examples, how mutation may affect the phenotype;**  **Mutations**  Gene mutation   1. Base substitution 2. Base addition 3. Base deletion   Chromosome mutations  Mutagen  Frame Shifts  Silent mutation  *Sickle Cell Anemia*    *Phenylketonuria*    (h) **explain, with examples, how the environment may affect the phenotype;**  ( i) **explain how a change in the nucleotide sequence in DNA may affect the amino acid sequence in a protein and hence the phenotype of the organism;**  **Environment and Phenotype:** |
| O Inherited change  **Content**  • **Passage of information from parent to offspring**  • **Nature of genes and alleles and their role in determining the phenotype**  • **Monohybrid and dihybrid crosses**  **Learning Outcomes**  Candidates should be able to:  (a) **[PA] describe, with the aid of diagrams, the behaviour of chromosomes during meiosis, and the**  **associated behaviour of the nuclear envelope, cell membrane and centrioles (names of the main**  **stages are expected, but not the sub-divisions of prophase);**  (b) **explain how meiosis and fertilisation can lead to variation;**  (c) **explain the terms *locus*, *allele*, *dominant*, *recessive*, *codominant*, *homozygous*, *heterozygous*,**  ***phenotype* and *genotype* (see section 5);**  (d) **use genetic diagrams to solve problems involving monohybrid and dihybrid crosses, including**  **those involving sex linkage, codominance and multiple alleles (but not involving autosomal**  **linkage or epistasis);**  (e) **use genetic diagrams to solve problems involving test crosses;**  (f) **[PA] use the chi-squared test to test the significance of differences between observed and**  **expected results (the formula for the chi-squared test will be provided);**  (g) **explain, with examples, how mutation may affect the phenotype;**  (h) **explain, with examples, how the environment may affect the phenotype;**  (i) **explain how a change in the nucleotide sequence in DNA may affect the amino acid sequence in a**  **protein and hence the phenotype of the organism;**  (j) **use the knowledge gained in this section in new situations or to solve related problems.** | | |