

BOWEN UNIVERSITY, IWO
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE
PURE AND APPLIED BIOLOGY PROGRAMME
2022/2023 FIRST SEMESTER EXAMINATION
PAB 401: POPULATION GENETICS
PRACTICAL

Time allowed: 1 hour.

Answer **all** questions.

You are provided with seven (7) containers labelled A, B, F₁, F₂, F₃, F₄, and F₅. Container A is a bank of black and yellow beads. Container B has 10 black and 10 yellow beads, each colour representing two sets of individuals of the parental generation. Draw a bead at random from the parent population in container B to represent an individual which produces two offspring. These (two) offspring of the same colour will be drawn from the bead bank in container A, and placed in container F₁. Return the bead into container B and draw another one at random to produce another two offspring in container F₁ until there are 20 new individuals. This represents the F₁ generation. Ensure that each selected bead is returned into the parent container before making another selection. Keep repeating the process above until you obtain the F₅ generation for container F₅.

Use the experiment above to answer the following:

1. Record the ratios of black to yellow individuals as it changes from F₁ generation to F₅ generation. *(5 marks)*
2. List and explain any **three** factors that could be responsible for changes in colour ratio from F₁ to F₅ generation. *(15 marks)*
3. What principle does the outcome of this experiment explain? *(1 mark)*
4. If you were provided with 1000 beads (individuals) of equal black and yellow colours in container B, will your observation remain the same? Explain *(4 marks)*