1. In relation to flowering plants explain what is meant by vegetative propagation.

**Type of reproduction in plants that does not involve the production of seed**

1. Clones are genetically identical individuals. Are the products of vegetative propagation clones? Explain your answer.

**Yes. No gametes used. Only one parent**

1. Give two examples of natural vegetative propagation that involve different parts of a plant.

Stem**: rhizomes, corms;** Root**: tubers;** Bud**: bulbs**

1. Describe two techniques of artificial vegetative propagation that are used for flowering plants. Suggest a benefit of artificial propagation.

**Cuttings, layering, grafting, budding, tissue culturing; Benefit: all offspring identical**

1. What is vegetative propagation?

**Asexual reproduction (in plants) / cloning**

1. Give one example of vegetative propagation and state whether it involves a stem, a root, a leaf or a bud.

**“Seed” potatoes – stem; Runners of strawberries etc. – stem; Tuber of Dahlia – root; Bulb of onion – stem / leaf / bud; New plants from leaf – leaf; Artificial examples, e.g. cuttings / grafts / layers – stem / bud / stem**

1. How does vegetative propagation differ from reproduction by seed?

**One parent / less variation in offspring /no pollination /no sexual reproduction**

1. Artificial propagation is widely used in horticulture. Give two examples of artificial propagation.

**Cutting / grafting / layering / micropropagation**

1. Suggest one advantage and one disadvantage of artificial propagation.

Advantage **– simple / fast / same as parent / avoids competition;** Disadvantage **– lack of variation / diseases inherited**

1. What is meant by vegetative propagation?
2. **Production of new plant from root** or **from stem** or **from leaf** or **plant asexual reproduction (**or **described)**
3. Horticulturists use a number of methods to artificially propagate plants. Suggest one advantage of artificial propagation.

**Fast** or **preserves desirable features** or **cheap** or **more reliable**

1. Describe two methods used by horticulturists to artificially propagate plants.

**Cuttings (**or **described) / layering (**or **described) / grafting (**or **described) / micro-propagation (**or **described)**

1. Give two differences between vegetative propagation and propagation involving seeds.

**No gametes (**or **one parent) / identical plants** or **example / rapid production / no outside agent**

1. Sometimes artificial methods are used to propagate (reproduce) plants. Name any two methods of artificially propagating plants.

**Grafting / cutting / layering / etc.**

1. Name the two main types of reproduction.

**Sexual & Asexual reproduction**

1. What term is used for the type of asexual reproduction that produces a daughter plant by runners?

**Vegetative propagation**

1. Would you expect a daughter plant produced by a runner to be haploid or diploid? Explain your answer.

**Diploid. Product of mitosis or genetically identical (to parent) or clone**

1. Give one method, other than runners, and not involving seeds, that is used by horticulturists to produce new plants.

**Cuttings or layering or grafting or micro-propagation or tissue culture**

1. What is meant by the term vegetative propagation?

**Asexual / reproduction**

1. Give one example of vegetative propagation in plants and state whether it involve a stem, a root, a leaf or a bud.

**One example / whether stem-root-leaf-bud**

1. State two ways that vegetative propagation differs from reproduction by seed.

**Spread / limited spread / offspring all susceptible to same diseases**

1. Artificial propagation is widely used in horticulture. Give two example of artificial propagation carried out by gardeners or horticulturists.

**e.g. Cuttings / layering / budding / grafting**

1. Give one advantage and one disadvantage of artificial propagation.

***Advantage*: e.g. can control production of desirable features; *Disadvantage*: e.g. offspring all susceptible to same diseases**