2025 Bi H2 Q13

Section: Sustainability and Interdependence
Topic: Symbiosis

Question Summary:
This question concerns parasitic relationships in solitary bees and flies, protection within social bee colonies, and kin selection explaining why sterile bees benefit from raising relatives.

Worked Solution

(a) A parasite benefits at the expense of its host. The fly larvae **gain food** by eating the pollen that the solitary bee collected, while the bee larvae **lose** food and suffer harm. Therefore the flies are parasites.

(b) It would be difficult for flies to lay eggs in a social beehive because social bees **defend the hive**. Large numbers of workers guard the entrance and would attack or remove intruders, preventing flies from entering.

(c) Helping raise relatives allows sterile workers to ensure that **shared genes** are passed on. By protecting and caring for siblings, they increase the survival of genes they share with the queen's offspring.

Final Answer:
Flies are parasites because they benefit while harming bee larvae. Social bees defend the hive, preventing flies from entering. Sterile workers benefit as helping relatives increases the survival of shared genes.

Revision Tips
- Parasitism always involves one organism gaining while the host is

harmed.
- Social insects defend the colony collectively.
- Kin selection explains why individuals help relatives reproduce.