CLASS: XII	DEPARTMENT: SCIENCE 2025-26 SUBJECT: BIOLOGY	DATE: 05/11/2025
WORKSHEET NO:11	TOPIC: ORGANISMS AND POPULATION	NOTE: A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

CASE STUDY

1) The diagram given below depicts different species of Warbler birds feeding on different regions of a Spruce tree.
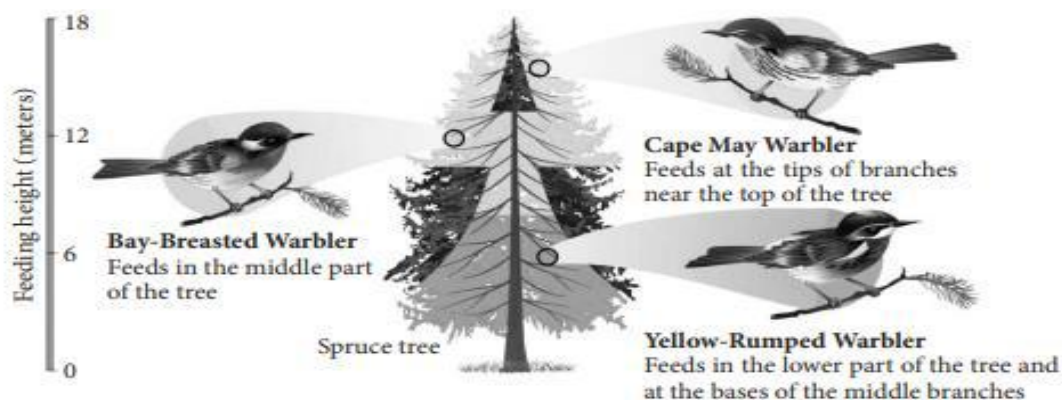
a) The Warblers are avoiding which kind of interaction and why.

b) What does Gause's Principle state?

c) The Abingdon tortoise had to face extinction, while the Warblers avoided extinction. Briefly explain how this was possible.

2.*Commensalism:* This is the interaction in which one species benefits and the other is neither harmed nor benefited. An orchid growing as an *epiphyte* on a mango branch, and barnacles growing on the back of a whale, benefit while neither the mango tree nor the whale derives any apparent benefit.
Mutualism: This interaction confers benefits on both the interacting species.

a) How is commensalism different from mutualism?

b) The figure given below shows a relationship between clown fish and sea anemone. Explain this relationship.

c) The cattle egret and grazing cattle in close association is an example of which association? Briefly explain this association.

MULTIPLE CHOICE QUESTIONS

1. Identify a feature which a population has but not an individual
   (a) Death
   (b) Birth
   (c) Birth rate
   (d) Age
2. Which among the following is a characteristic feature of exponential growth?
   (a) Limited resources
   (b) Unlimited resources
   (c) Check by nature
   (d) Competition
3. A population interaction where both partners are negatively affected
   (a) Predation
   (b) Parasitism
   (c) Competition
   (d) Ammensalism
4. Interaction present between Vanda and mango tree is
   (a) Commensalism
   (b) Mutualism
   (c) Parasitism
   (d) Ammensalism
5. Co-evolution can be observed in the case of
   (a) Mutualism
   (b) Parasitism
   (c) Both (a) and (b)
   (d) Ammensalism

TWO MARKS QUESTIONS

6. Give any one example of brood parasitism.

7. When does a population growth curve assume J-shape?
8. Define carrying capacity
9. Name any four population attributes

THREE MARKS QUESTIONS

10. What are the two forms of population growth? Explain.
11. Write the importance of measuring the size of a population in a habitat or an ecosystem.
12. While living in and on the host species, the animal parasite has evolved certain adaptations. Give examples.
13. Climbers are vascular plants rooted in the ground and maintain the erectness of their stems, making use of other plants. Discuss the type of association between that type of climbers and host plants.
14. Identify the type of interaction mentioned in the following examples and give another example for each one.
    (i) The cattle egret and grazing cattle
    (ii) Fungi and roots of higher plants

FIVE MARKS QUESTIONS

15. (a) List any three ways of measuring population density of a habitat.
     (b) Mention the essential information that can be obtained by studying the population density of an organism

PREVIOUS BOARD QUESTIONS

16. (a) Why are herbivores considered similar to predators in the ecological context? Explain.
    (b) Differentiate between the following interspecific interactions in a population?
    (i) Mutualism & Competition   (ii) Commensalism & Ammensalism
17. A population of *Paramecium* was grown in a culture medium. After 5 days the culture medium became overcrowded and had depleted nutrients. What will happen to the population and what type of growth curve will the population attain? Draw the growth curve.

18. (a)Explain the birth rate in a population by taking a suitable example.
    (b) Write the other two characteristics which only a population shows but an individual cannot.
19. Study the age pyramids, A, B and C of the human population given below and answer the questions that follow

A   B   C
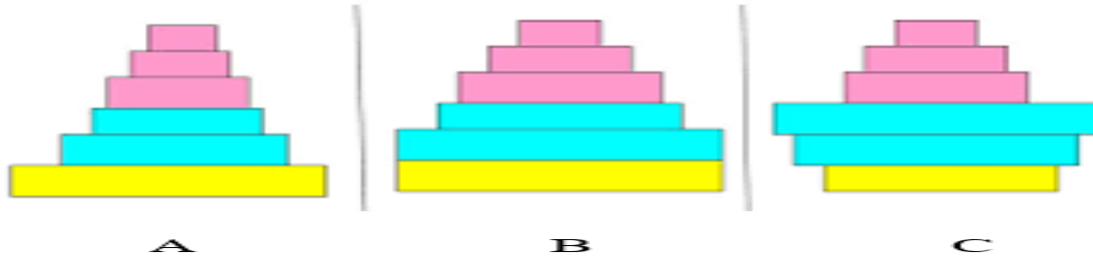
(a) Identify pyramids 'B' and 'C'

(b) Write the basis on which the above pyramids are plotted

20. Study the population growth curve given below and answer the questions that follow
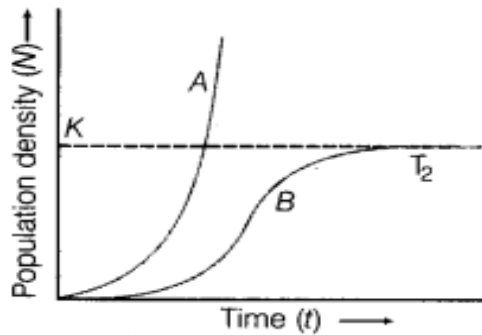
(a) Identify 'A' and 'B' shown in the graph

(b) When and why do such curves occur in a population?

HINTS AND SOLUTION

Qn. No.	MULTIPLE CHOICE QUESTIONS	Marks
1	(c) Birth rate	1
2	(b) Unlimited resources	1
3	(c) Competition	1
4	(a) Commensalism	1
5	(c) Both (a) and (b)	1
	2 MARKS QUESTIONS	
6	Cuckoo bird and crow – explanation	2
7	Unlimited resources and lack of competition	2
8	The maximum number of individuals that can be accommodated by the ecosystem for long period of time	2
9	Natality, mortality, immigration and emigration	2
	3 MARKS QUESTIONS	
10	Exponential and logistic growth models – explanation, equations and graph	3
11	The size of the population tells us a lot about its status in the habitat. Whatever ecological processes we wish to investigate in a population, be it the outcome of competition with another species, the	3

	impact of a predator or the effect of a pesticide application, a measure of population density is important	
12	Loss of unnecessary sense organs, presence of adhesive organs or suckers to cling on to the host, loss of digestive system and high reproductive capacity	3
13	Commensalism - explanation	3
14	Commensalism and mutualism – one more example each	3
	5 MARKS QUESTIONS	
15	(a) Counting number, percentage of cover, relative density and indirect method – explanation **(b)** Refer question 10	5
	PREVIOUS BOARD QUESTIONS	
16	(a) Herbivores feed on plants (b) Mutualism and competition; commensalism and ammensalism – differences in table form	5
17	Initial growth is exponential and J shaped curve, then sharp decline due to lack of nutrients	3
18	(a) If in a pond there were 20 lotus plants last year and through reproduction, 8 new plants are added, taking the current population to 28, we calculate the birth rate as $8/20 = 0.4$ offspring per lotus per year. (b) Birth rate, death rate, sex ratio and age pyramids	5
19	(a) B – stable, C – declining (b) Number of pre-reproductive, reproductive and post – reproductive groups	3
20	(a) A – Exponential growth, B – logistic growth (b) Conditions for growth models	3

Prepared by: *Ms Agnes Aranha*	*Checked by:* *HOD Science*