

PAPER-III POPULATION ECOLOGY AND ANIMAL BEHAVIOUR

(Questions will be set from each Unit)

- UNIT - I**
- 1. Demography :** (a) Life Tables. (c) Net Reproduction. (b) Generation Time. (d) Reproductive Value.
 - 2. Population Growth :** (a) Growth of organisms with non-overlapping generations. (b) Stochastic and time lag models of population growth. (c) Stable age distribution
 - 3. Life History Strategies :** (a) Evolution of life history traits. (b) Longevity and theories of ageing. (c) Energy apportionment between Somatic Growth and Reproduction. (d) Parental Investment and offspring. (e) Reproductive Strategies - Ecology and Evolution of Sex and mating system, Optimal Body Size, r - and k - selection.
- UNIT - II**
- 1. Predation :** (a) Models of prey-predatory dynamics. (b) Optimal foraging theory (Patch Choice, Diet Choice, Prey selectivity, Foraging time). (c) Role of Predation in nature.
 - 2. Competition and niche-theory :** (a) Intraspecific and Interspecific competition. (b) History of niche concepts. (c) Theory of limiting Similarity.
 - 3. Mutualism :** (a) Evolution of Mutualism. (b) Plant - Pollinator and Animal - Animal Interactions. (c) Basic Models.
 - 4. Population regulation -** Extrinsic and intrinsic mechanism.
 - 5. Case studies in population dynamics -** Fisheries, Wild Life and Biological Control of Agriculture pests.
- UNIT - III**
- 1. Innate Behaviour.**
 - 2. Perceptin of the environment :** (a) Mechanical. (b) Electrical. (c) Chemical. (d) Olfactory. (e) Audiotry. (f) Visual.
 - 3. Neural and hormonal control of behaviour.**
 - 4. Genetic and environmental components in the development of behaviour.**
 - 5. Communication :** (a) Chemical (b) Visual (c) Light (d) Audio (e) Species specificity of songs (f) Evolution of language.
- UNIT - IV**
- 1. Ecological Aspects of Behaviour :** (a) Habitat selection, Food selection, Anti-Predator defenses. (b) Aggression, homing, territoriality, dispersal. (c) Host - Parasite Relations.
 - 2. Social Behaviour :** (a) Aggregations - Schooling in fishes. Flocking in brds, herding in mammals. (b) Group selection, Kin selection, reciprocal altruism, inclusive fitness. (c) Social organization in insects and primates.
 - 3. Reproductive behaviour :** (a) Reproductive Strategies. (b) Mating Systems. (c) Courtship. (d) Sexual Selection. (e) Sperm Competition. (f) Parental care.
 - 4. Biological Rhythms :** (a) Circadian and Circannual Rhythms. (b) Orientation and navigatin. (c) Migration of fish and birds.
 - 5. Learning and memory :** (1) Conditioning. (2) Habituation. (3) Insight learning. (4) Association Learning. (5) Reasoning. (6) Cognitive skills.