Solution

CET25B11 ORGANISMS AND POPULATIONS

Class 12 - Biology

1. **(c)** Negative interactions
Explanation: Negative interactions include completion, predation, parasitism, and amensalism. Penicillin and Streptomycin prohibits the growth of microbes or kills the microbes that are a kind of negative interaction.

2. **(d)** If a predator is not efficient, then the prey population would become extinct.
Explanation: If a predator is not efficient, then the prey population would become extinct.

3. **(d)** Gause's principle
Explanation: In competition, a superior competitor eliminates the inferior one. This statement is called Gause's competitive exclusion principle. Two closely related competing for the same resources cannot co-exist indefinitely and inferior will be eliminated.

4. **(d)** Mutualism
Explanation: One type of symbiotic relationship found in nature is called mutualism. Mutualism is a relationship between organisms in which both species involved benefit to some extent with neither species being harmed.

5. **(a)** Commensalism
Explanation: Commensalism

6. **(b)** One organism is benefited, other is affected
Explanation: Parasitism is a non-mutual relationship between species, where one species, the parasite, benefits at the expense of the other, the host. Traditionally parasite (in biological usage) referred primarily to organisms visible to the naked eye, or macroparasites.

7. **(c)** Community stratification
Explanation: In deep lakes differenet zones are formed according to availabilityof light, food and temperature. These zones are called littoral, limnetic and profundal zone. It is a kind of community stratification or separation.

8. **(d)** Parasitism
Explanation: Parasitism

9. **(a)** Reproductive isolation
Explanation: Reproductive isolation

10. **(b)** small population of reindeer experimentally reared in natural environment.
Explanation: The J-shaped growth curve is characteristic of a small population of reindeer experimentally reared in a natural environment in which growth occurs at very fast rate due to availability of sufficient natural resources.

11. **(c)** Stabilized
Explanation: In asymptote state population is Stabilized

12. **(b)** intraspecific competition
Explanation: Intraspecific competition could be most intense and strongest as it occurs between organisms having the same types of requirement of food, water, etc. They may have competition for food, shelter, water, space or matter also.

13. **(d)** Commensalism

Explanation: Commensalism is an association between two different organisms in which one is always benefited but the other is neither benefited nor harmed.

14. **(a)** S-shaped
Explanation: The human population growth curve is S-shaped in which at initial stage growth is slow followed by exponential growth and finally again starts declining to follow sigmoid curve growth.

15. **(a)** Etiolated
Explanation: Etiolated

16. **(c)** Embryonic phase group
Explanation: Age groups among the human population include reproductive, pre-reproductive, and post-reproductive growth. It does not include embryonic phase growth.

17. **(a)** Vital index
Explanation: Vital index

18. **(d)** Higher plant roots and Glomus.
Explanation: Higher plant roots and Glomus.

19. **(c)** Reproductive fitness
Explanation: The term Darwinian fitness among populations living together signifies the reproductive fitness of organisms population. Those species that can reproduce in between are called reproductive fitness.

20. **(c)** Biotic potential
Explanation: Biotic potential

21. **(a)** Symbiosis
Explanation: Symbiosis

22. **(c)** Fungus and alga
Explanation: Lichen represents an intimate relationship between a fungus and photosynthetic algae.

23. **(b)** k = N
Explanation: k = N

24. **(d)** Its population growth curve is of J-type.
Explanation: Its population growth curve is of J-type.

25. **(a)** Lice on humans is an ectoparasite.
Explanation: Lice on humans are ectoparasites.

26. **(b)** High percentage of young individuals.
Explanation: High percentage of young individuals.

27. **(a)** G. F. Gause
Explanation: G. F. Gause

28. **(b)** $W_1 = W_0 e^{rt}$

Explanation: $W_1 = W_0 e^{rt}$

29. **(d)** Parthenium hysterophorus - Threat to biodiversity
Explanation: Parthenium hysterophorus - Threat to biodiversity

30.

(c) Predation
Explanation: Predation

31.

(c) Exponential phase
Explanation: Exponential phase

32.

(c) Exponential
Explanation: Exponential

33.

(b) Social parasitism
Explanation: Eudynamys or Koel laying eggs in the nest of crow is an example of social parasitism. Crow rears the egg of koel using their labour and time without any benefit so, it is social parasitism.

34.

(c) Frankia
Explanation: Frankia

35.

(d) Zero population growth
Explanation: Zero population growth

36.

(b) Alga and fungi
Explanation: Alga and fungi

37. **(a)** Competition
Explanation: Competition

38.

(d) Logistic
Explanation: Logistic

39.

(c) Parasitism
Explanation: Parasitism

40.

(d) Plasmodium-Anopheles
Explanation: Plasmodium-Anopheles

41.

(c) Co-evolution, sexual deceit and pseudo-copulation
Explanation: Mediterranean orchid Ophrys ensures pollination by co-evolution, sexual deceit, and pseudo-copulation. One petal of flower bears an uncanny resemblance to female of bee in size, colour, and markings.

42.

(b) Gene flow does not occur between the populations of a species.
Explanation: Gene flow does not occur between the populations of a species.

43.

(c) rectangular hyperbola
Explanation: rectangular hyperbola

44. **(a)** Renew the culture medium
Explanation: Culture medium provides all the nutrients required for the growth of bacteria. To avoid the death or decline of bacterial cells in the medium, the culture medium must be changed periodically.

45.

(c) Metre^2
Explanation: Metre^2

46.

(d) Tautonym
Explanation: Tautonym

47.

(b) Environmental resistance
Explanation: Environmental resistance

48.

(b) Immigrate rate, natality rate, mortality rate

Explanation: Immigrate rate, natality rate, mortality rate

49.

(b) Niche density
Explanation: Niche density

50. **(a)** Pre-reproductive individuals are more than the reproductive individuals.
Explanation: Pre-reproductive individuals are more than the reproductive individuals.

51. **(a)** Demecology
Explanation: Demecology

52. **(a)** Natality increases and mortality decreases.
Explanation: Natality increases and mortality decreases.

53.

(b) (i) and (iv)
Explanation: (i) and (iv) show commensalism

54. **(a)** S-shaped growth curve
Explanation: S-shaped growth curve

55. **(a)** 64
Explanation: generation 1 = 2
generation 2 = 4
generation 3, 4, 5 = 8,16, 32 protozoans
genetration 6 = 64 protozoans.

56.

(b) 250 years
Explanation: 250 years

57.

(d) Zero
Explanation: Zero

58.

(d) Predators
Explanation: The insect that feeds on plant sap and other parts of plants are called phytophagous. Phytophagous insects will be similar to predators and plants acts like prey.

59. **(a)** 11th July
Explanation: 11th July

60.

(c) Biological control of pest population
Explanation: The biological control method adopted in agricultural pest control is based on the ability of the predator to regulate the prey population.

61.

(d) World Population Day
Explanation: World Population Day

62.

(d) $\frac{dN}{dt} = rN(1 - \frac{N}{K})$
Explanation: $\frac{dN}{dt} = rN(1 - \frac{N}{K})$

63.

(c) Environmental resistance
Explanation: Environmental resistance

64. **(a)** Steady state phase, lag phase and log phase.
Explanation: Steady state phase, lag phase and log phase.

65.

(d) Salamander
Explanation: Salamander

66.

(c) Mycorrhiza
Explanation: Mycorrhiza

67. **(a)** Resource partitioning
Explanation: Species facing completion might evolve a mechanism that promotes co-existence rather than exclusion that mechanism is called resource partitioning. In which they avoid completion by choosing different times of feeding or different foraging patterns.

68.

(b) Rhizobia
Explanation: Rhizobia

69.

(c) Predation and parasitism
Explanation: Antagonistic interaction will include predation and parasitism in which one species is benefited and other is harmed.

70.

(b) J-shaped curve
Explanation: Exponential growth pattern in population results into a j-shaped curve. During exponential growth faster growth occurs and a j-shaped curve is formed when time v/s growth is drawn.

71.

(d) $\frac{dN}{dt} = rN$
Explanation: $\frac{dN}{dt} = rN$

72.

(d) increase showing positive growth
Explanation: If more individuals are added than are lost i.e., the vital index is more than 100, the population will **increase** or show **positive growth.**

73.

(d) Short life span and high birth rate
Explanation: Short life span and high birth rate

74. **(a)** Population genetics and evolution
Explanation: Population ecology is an important area of ecology because it links ecology to population genetics and evolution. At population level natural selection operates to evolve desired traits.

75.

(c) 17 millions
Explanation: Growth rate = dN/dt =rN
r =Rate of nature increse
N = Size of original population
Using the equation expected polulation in 2015 = 17 millions