CHAPTER 14

Ecosystem

14.0 Introduction

1. The term ecosystem was coined by
   (a) E. Haeckel (b) E.Warming
   (c) E.P. Odum (d) A. G. Tansley.
   (NEET-I 2016)

14.1 Ecosystem – Structure and Function

2. Which one of the following is a characteristic feature of cropland ecosystem?
   (a) Absence of weeds
   (b) Ecological succession
   (c) Absence of soil organisms
   (d) Least genetic diversity *(NEET-I 2016)*

3. Vertical distribution of different species occupying different levels in a biotic community is known as
   (a) zonation (b) pyramid
   (c) divergence (d) stratification.
   (2015 Cancelled)

4. Which one of the following is not a functional unit of an ecosystem?
   (a) Energy flow (b) Decomposition
   (c) Productivity (d) Stratification *(2012)*

5. Which one of the following is one of the characteristics of a biological community?
   (a) Stratification (b) Natality
   (c) Mortality (d) Sex-ratio *(2010)*

6. Which of the following is the most stable ecosystem?
   (a) Mountain (b) Ocean
   (c) Forest (d) Desert *(1995)*

14.2 Productivity

7. In relation to Gross primary productivity and Net primary productivity of an ecosystem, which one of the following statements is correct?
   (a) Gross primary productivity is always less than Net primary productivity.
   (b) Gross primary productivity is always more than Net primary productivity.
   (c) Gross primary productivity and Net primary productivity are one and same.
   (d) There is no relationship between Gross primary productivity and Net primary productivity.
   (NEET 2020)

8. The mass of living material at a trophic level at a particular time is called
   (a) net primary productivity
   (b) standing crop
   (c) gross primary productivity
   (d) standing state. *(2015 Cancelled)*

9. In an ecosystem the rate of production of organic matter during photosynthesis is termed as
   (a) secondary productivity
   (b) net productivity
   (c) net primary productivity
   (d) gross primary productivity. *(2015 Cancelled)*

10. Secondary productivity is rate of formation of new organic matter by
    (a) consumers (b) decomposers
    (c) producers (d) parasites.
    (NEET 2013)

11. The rate of formation of new organic matter by rabbit in a grassland, is called
    (a) net productivity
    (b) secondary productivity
    (c) net primary productivity
    (d) gross primary productivity. *(Mains 2012)*

12. Mass of living matter at a trophic level in an area at any time is called
    (a) standing crop (b) detritus
    (c) humus (d) standing state. *(2011)*

13. The biomass available for consumption by the herbivores and the decomposers is called
    (a) net primary productivity
    (b) secondary productivity
    (c) standing crop
    (d) gross primary productivity. *(2010)*

14. Which one of the following ecosystem types has the highest annual net primary productivity?
(a) Tropical deciduous forest
(b) Temperate evergreen forest
(c) Temperate deciduous forest
(d) Tropical rainforest *(2007)*

15. Which of the following is expected to have the highest value ($gm/m^2/yr$) in a grassland ecosystem?
(a) Secondary production
(b) Tertiary production
(c) Gross production (GP)
(d) Net production (NP) *(2004)*

16. The rate at which light energy is converted into chemical energy of organic molecules is the ecosystem's
(a) net secondary productivity
(b) gross primary productivity
(c) net primary productivity
(d) gross secondary productivity. *(1998)*

17. Which of the following ecosystem has the highest gross primary productivity?
(a) Mangroves (b) Rainforest
(c) Grassland (d) Coral reef *(1997)*

18. Maximum solar energy is trapped by
(a) planting trees
(b) cultivating crops
(c) growing algae in tanks
(d) growing grasses. *(1993)*

19. A very efficient converter of solar energy with net productivity of 204 kg/m^2 or more is the crop
(a) wheat (b) sugarcane
(c) rice (d) bajra. *(1989)*

14.3 Decomposition

20. Which one of the following processes during decomposition is correctly described?
(a) Catabolism – Last step in the decomposition under fully anaerobic condition
(b) Leaching – Water soluble inorganic nutrients rise to the top layers of soil
(c) Fragmentation – Carried out by organisms such as earthworm
(d) Humification – Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate.
(NEET 2013)

21. The breakdown of detritus into smaller particles by earthworm is a process called
(a) humification (b) fragmentation
(c) mineralisation (d) catabolism.
(Mains 2011)

22. The slow rate of decomposition of fallen logs in nature is due to their
(a) anaerobic environment around them
(b) low cellulose content
(c) low moisture content
(d) poor nitrogen content. *(2008)*

23. Plant decomposers are
(a) monera and fungi
(b) fungi and plants
(c) protista and animalia
(d) animalia and monera. *(2001)*

24. Which of the following acts as "nature's scavengers"?
(a) Insects (b) Microorganisms
(c) Man (d) Animals *(1997)*

25. If we completely remove the decomposers from an ecosystem, its functioning will be adversely affected, because
(a) mineral movement will be blocked
(b) the rate of decomposition will be very high
(c) energy flow will be blocked
(d) herbivores will not receive solar energy. *(1995)*

14.4 Energy Flow

26. The primary producers of the deep-sea hydrothermal vent ecosystem are
(a) green algae
(b) chemosynthetic bacteria
(c) blue-green algae
(d) coral reefs. *(NEET-II 2016)*

27. Most animals that live in deep oceanic waters are
(a) tertiary consumers
(b) detritivores
(c) primary consumers
(d) secondary consumers. *(2015)*

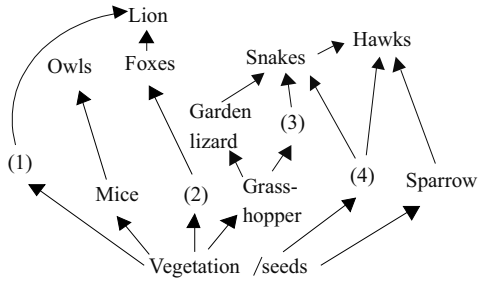
28. If 20 J of energy is trapped at producer level, then how much energy will be available to peacock as food in the following chain?
Plant → Mice → Snake → Peacock
(a) 0.02 J (b) 0.002 J
(c) 0.2 J (d) 0.0002 J *(2014)*

29. Which of the following is a primary consumer in maize field ecosystem?
(a) Grasshopper (b) Wolf
(c) Phytoplankton (d) Lion
(Karnataka NEET 2013)

30. When man eats fish which feeds on zooplanktons which have eaten small plants, the producer in this chain is
(a) small plants (b) fish
(c) man (d) zooplankton.
(Karnataka NEET 2013)

31. Identify the possible link "A" in the following food chain.
Plant → Insect → Frog → "A" → Eagle
(a) Rabbit (b) Wolf
(c) Cobra (d) Parrot *(2012)*

32. Identify the likely organisms (1), (2), (3) and (4) in the food web shown below.



	(1)	(2)	(3)	(4)
(a)	Deer	Rabbit	Frog	Rat
(b)	Dog	Squirrel	Bat	Deer
(c)	Rat	Dog	Tortoise	Crow
(d)	Squirrel	Cat	Rat	Pigeon

(Mains 2012)

33. Of the total incident solar radiation the proportion of PAR is
(a) about 70% (b) about 60%
(c) less than 50% (d) more than 80%.
(2011)

34. Which one of the following animals may occupy more than one trophic levels in the same ecosystem at the same time?
(a) Sparrow (b) Lion
(c) Goat (d) Frog *(Mains 2011)*

35. Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem?
(a) Fish (b) Zooplankton
(c) Frog (d) Phytoplankton *(2009)*

36. Consider the following statements concerning food chains.
A. Removal of 80% tigers from an area resulted in greatly increased growth of vegetation.
B. Removal of most of the carnivores resulted in an increased population of deers.
C. The length of food chains is generally limited to 3-4 trophic levels due to energy loss.
D. The length of food chains may vary from 2 to 8 trophic levels.
Which two of the above statements are correct?
(a) A, D (b) A, B
(c) B, C (d) C, D *(2008)*

37. Bamboo plant is growing in a fir forest then what will be the trophic level of it?
(a) First trophic level (T_1)
(b) Second trophic level (T_2)
(c) Third trophic level (T_3)
(d) Fourth trophic level (T_4) *(2002)*

38. Which is the reason for highest biomass in aquatic ecosystem?
(a) Nano plankton, blue green algae and green algae
(b) Sea grass and slime moulds
(c) Benthic and brown algae
(d) Diatoms *(2000)*

39. Energy transfer from one trophic level to other, in a food chain, is
(a) 10% (b) 20% (c) 1% (d) 2%.
(1999)

40. In a terrestrial ecosystem such as forest, maximum energy is in which trophic level?
(a) T_3 (b) T_4 (c) T_1 (d) T_2 *(1998)*

41. The 10% energy transfer law of food chain was given by
(a) Lindemann (b) Tansley
(c) Stanley (d) Weismann. *(1996)*

42. In a biotic community, the primary consumers are
(a) detritivores (b) herbivores
(c) carnivores (d) omnivores.
(1995)

43. The dominant second trophic level, in a lake ecosystem, is
(a) phytoplankton (b) zooplankton
(c) benthos (d) plankton. *(1994)*

44. Food chain in which microorganisms breakdown the food formed by primary producers is
(a) parasitic food chain (b) detritus food chain
(c) consumer food chain
(d) predator food chain. *(1991)*

45. Pick up the correct food chain.
(a) Grass → Chameleon → Insect → Bird
(b) Grass → Fox → Rabbit → Bird
(c) Phytoplankton → Zooplankton → Fish
(d) Fallen leaves → Bacteria → Insect larvae
(1991)

46. Upper part of sea/aquatic ecosystem contains
(a) plankton
(b) nekton
(c) plankton and nekton
(d) benthos. *(1988)*

47. What is true of ecosystem?
(a) Primary consumers are least dependent upon producers.
(b) Primary consumers out-number producers.
(c) Producers are more than primary consumers.
(d) Secondary consumers are the largest and most powerful. *(1988)*

48. In an ecosystem, which one shows one-way passage?
(a) Free energy (b) Carbon
(c) Nitrogen (d) Potassium *(1988)*

14.5 Ecological Pyramids

49. Match the trophic levels with their correct species examples in grassland ecosystem.
(A) Fourth trophic level (i) Crow
(B) Second trophic level (ii) Vulture
(C) First trophic level (iii) Rabbit
(D) Third trophic level (iv) Grass
Select the correct option.

	(A)	(B)	(C)	(D)
(a)	(ii)	(iii)	(iv)	(i)
(b)	(iii)	(ii)	(i)	(iv)
(c)	(iv)	(iii)	(ii)	(i)
(d)	(i)	(ii)	(iii)	(iv)

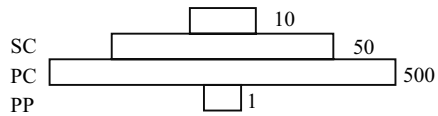
(NEET 2020)

50. Which of the following ecological pyramids is generally inverted?
(a) Pyramid of biomass in a sea
(b) Pyramid of numbers in grassland
(c) Pyramid of energy
(d) Pyramid of biomass in a forest *(NEET 2019)*

51. What type of ecological pyramid would be obtained with the following data?
Secondary consumer : 120 g
Primary consumer : 60 g
Primary producer : 10 g
(a) Inverted pyramid of biomass
(b) Pyramid of energy
(c) Upright pyramid of numbers
(d) Upright pyramid of biomass *(NEET 2018)*

52. Which ecosystem has the maximum biomass?
(a) Grassland ecosystem
(b) Pond ecosystem
(c) Lake ecosystem
(d) Forest ecosystem *(NEET 2017)*

53. Given below is an imaginary pyramid of numbers. What could be one of the possibilities about certain organisms at some of the different levels?

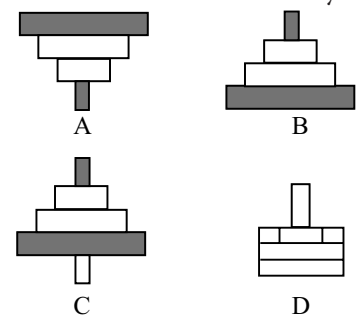


(a) Level PC is "insects" and level SC is "small insectivorous birds".
(b) Level PP is "phytoplanktons" in sea and level TC is "whale" on top.
(c) Level one PP is "*pipal* trees" and the level SC is "sheep".
(d) Level PC is "rats" and level SC is "cats". *(2012)*

54. The upright pyramid of number is absent in
(a) pond (b) forest
(c) lake (d) grassland. *(2012)*

55. Which one of the following statements for the pyramid of energy is incorrect ?
(a) Its base is broad.
(b) It shows energy content of different trophic level organisms.
(c) It is inverted in shape.
(d) It is upright in shape. *(2011)*

56. Which of the following representations shows the pyramid of numbers in a forest ecosystem?



(a) D (b) A
(c) B (d) C *(Mains 2010)*

57. Which one of the following is not used for construction of ecological pyramids?
(a) Fresh weight (b) Dry weight
(c) Number of individuals
(d) Rate of energy flow *(2006)*

58. Pyramid of numbers deals with number of
(a) species in an area
(b) individuals in a community
(c) individuals in a trophic level
(d) subspecies in a community. *(1993)*

59. Pyramid of numbers in a pond ecosystem is
(a) irregular (b) inverted
(c) upright (d) spindle shaped.
(1993)

14.6 Ecological Succession

60. Which of the following would appear as the pioneer organisms on bare rocks?
(a) Mosses (b) Green algae
(c) Lichens (d) Liverworts
(NEET-I 2016)

61. During ecological succession
(a) the numbers and types of animals remain constant
(b) the changes lead to a community that is in near equilibrium with the environment and is called pioneer community
(c) the gradual and predictable change in species composition occurs in a given area
(d) the establishment of a new biotic community is very fast in its primary phase. *(2015)*

62. Secondary succession takes place on/in
(a) newly created pond
(b) newly cooled lava
(c) bare rock
(d) degraded forest. *(2015 Cancelled)*

63. The second stage of hydrosere is occupied by plants like
(a) *Azolla* (b) *Typha*
(c) *Salix* (d) *Vallisneria*.
(Mains 2012)

64. Which one of the following statements is correct for secondary succession?
(a) It begins on a bare rock.
(b) It occurs on a deforested site.
(c) It follows primary succession.
(d) It is similar to primary succession except that it has a relatively fast pace. *(2011)*

65. Both hydrarch and xerarch successions lead to
(a) medium water conditions
(b) xeric conditions
(c) highly dry conditions
(d) excessive wet conditions. *(Mains 2011)*

66. The correct sequence of plants in a hydrosere is
(a) *Volvox* → *Hydrilla* → *Pistia* → *Scirpus* → *Lantana* → Oak
(b) *Pistia* → *Volvox* → *Scirpus* → *Hydrilla* → Oak → *Lantana*
(c) Oak → *Lantana* → *Volvox* → *Hydrilla* → *Pistia* → *Scirpus*
(d) Oak → *Lantana* → *Scirpus* → *Pistia* → *Hydrilla* → *Volvox*. *(2009)*

67. An ecosystem which can be easily damaged but can recover after some time if damaging effect stops will be having
(a) low stability and high resilience
(b) high stability and low resilience
(c) low stability and low resilience
(d) high stability and high resilience. *(2004)*

68. The primary succession refers to the development of communities on a
(a) forest clearing after devastating fire
(b) newly-exposed habitat with no record of earlier vegetation
(c) freshly cleared crop field
(d) pond, freshly filled with water after a dry phase. *(1995)*

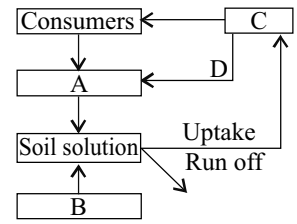
14.7 Nutrient Cycling

69. In which of the following both pairs have correct combination?

(a)	Gaseous nutrient cycle, Sedimentary nutrient cycle	Nitrogen and Sulphur, Carbon and Phosphorus
(b)	Gaseous nutrient cycle, Sedimentary nutrient cycle	Sulphur and Phosphorus, Carbon and Nitrogen
(c)	Gaseous nutrient cycle, Sedimentary nutrient cycle	Carbon and Nitrogen, Sulphur and Phosphorus
(d)	Gaseous nutrient cycle, Sedimentary nutrient cycle	Carbon and Sulphur, Nitrogen and Phosphorus

(2015)

70. Given below is a simplified model of phosphorus cycling in a terrestrial ecosystem with four blanks (A-D). Identify the blanks.



	A	B	C	D
(a)	Rock minerals	Detritus	Litter fall	Producers
(b)	Litter fall	Producers	Rock minerals	Detritus
(c)	Detritus	Rock minerals	Producers	Litter fall
(d)	Producers	Litter fall	Rock minerals	Detritus

(2014)

71. Natural reservoir of phosphorus is
(a) rock (b) fossils
(c) sea water (d) animal bones.
(NEET 2013)

72. Which one of the following is not a gaseous biogeochemical cycle in ecosystem?
(a) Sulphur cycle (b) Phosphorus cycle
(c) Nitrogen cycle (d) Carbon cycle *(2012)*

73. About 70% of total global carbon is found in
(a) oceans (b) forests
(c) grasslands (d) agroecosystems.
(2008)

74. Which of the following pairs is a sedimentary type of biogeochemical cycle?
(a) Phosphorus and nitrogen
(b) Phosphorus and sulphur
(c) Oxygen and nitrogen
(d) Phosphorus and carbon dioxide *(1995)*

14.8 Ecosystem Services

75. Match the following and select the correct option.

A.	Earthworm	(i) Pioneer species
B.	Succession	(ii) Detritivore
C.	Ecosystem service	(iii) Natality
D.	Population growth	(iv) Pollination

	A	B	C	D
(a)	(i)	(ii)	(iii)	(iv)
(b)	(iv)	(i)	(iii)	(ii)
(c)	(iii)	(ii)	(iv)	(i)
(d)	(ii)	(i)	(iv)	(iii)

(2014)

ANSWER KEY

1.	(d)	**2.**	(d)	**3.**	(d)	**4.**	(d)	**5.**	(a)	**6.**	(b)	**7.**	(b)	**8.**	(b)	**9.**	(d)	**10.**	(a)
11.	(b)	**12.**	(a)	**13.**	(a)	**14.**	(d)	**15.**	(c)	**16.**	(b)	**17.**	(b)	**18.**	(c)	**19.**	(b)	**20.**	(c)
21.	(b)	**22.**	(d)	**23.**	(a)	**24.**	(b)	**25.**	(a)	**26.**	(b)	**27.**	(b)	**28.**	(a)	**29.**	(a)	**30.**	(a)
31.	(c)	**32.**	(a)	**33.**	(c)	**34.**	(a)	**35.**	(a)	**36.**	(c)	**37.**	(a)	**38.**	(c)	**39.**	(a)	**40.**	(c)
41.	(a)	**42.**	(b)	**43.**	(b)	**44.**	(b)	**45.**	(c)	**46.**	(a)	**47.**	(c)	**48.**	(a)	**49.**	(a)	**50.**	(a)
51.	(a)	**52.**	(d)	**53.**	(a)	**54.**	(b)	**55.**	(c)	**56.**	(b,d)	**57.**	(a)	**58.**	(c)	**59.**	(c)	**60.**	(c)
61.	(c)	**62.**	(d)	**63.**	(d)	**64.**	(b)	**65.**	(a)	**66.**	(a)	**67.**	(a)	**68.**	(b)	**69.**	(c)	**70.**	(c)
71.	(a)	**72.**	(b)	**73.**	(a)	**74.**	(b)	**75.**	(d)										