DPP - Daily Practice Problems

Date : | **Start Time :** | **End Time :**

BIOLOGY CB36

SYLLABUS : Ecosystem

Max. Marks : 180 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. Deep black soil is productive due to high proportion of
(a) sand and zinc (b) gravel and calcium
(c) clay and humus (d) silt and earthworm

2. 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

3. The zone of atmosphere that lies near the ground is
(a) troposphere (b) stratosphere
(c) homosphere (d) ionosphere

4. Food chain in which micro-organisms breakdown the food formed by primary producers is
(a) parasitic food chain (b) detritus food chain
(c) consumer food chain (d) predator food chain

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

6. 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

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

8. Humus is essential for plant growth because:
(a) it is rich in nutrients and increases the water holding capacity of soil
(b) it increases aeration of soil
(c) it increases porocity of soil
(d) All of the above

RESPONSE GRID					
1. ⓐⓑⓒⓓ	**2.** ⓐⓑⓒⓓ	**3.** ⓐⓑⓒⓓ	**4.** ⓐⓑⓒⓓ	**5.** ⓐⓑⓒⓓ
6. ⓐⓑⓒⓓ	**7.** ⓐⓑⓒⓓ	**8.** ⓐⓑⓒⓓ		

9. The rate at which light energy is converted to the chemical energy of organic molecules in the ecosystem is
(a) net primary productivity
(b) gross primary productivity
(c) net secondary productivity
(d) gross secondary productivity

10. 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

11. Both hydrarch and xerarch successions lead to:
(a) medium water conditions
(b) xeric conditions
(c) highly dry conditions
(d) excessive wet conditions

12. Which of the following ecosystems has highest rate of gross primary production?
(a) Grasslands
(b) Mangroves
(c) Coral reefs
(d) Equatorial rain forest

13. Largest amount of fresh water is found in
(a) lakes and streams
(b) underground
(c) polar ice caps and glaciers
(d) rivers

14. Which one of the following is not a function of an ecosystem?
(a) Energy flow (b) Decomposition
(c) Productivity (d) Stratification

15. Ecosystem is
(a) always open
(b) always closed
(c) both open and closed depending upon community
(d) both open and closed depending upon biomass

16. Transition zone between two vegetations is
(a) ecotone (b) ecotype
(c) ecocline (d) ecosystem

17. Which one of the following statement is correct?
(a) Warm and moist environment favour decomposition whereas low temperature and anaerobiosis inhibit decomposition
(b) Warm and moist environment inhibit decomposition whereas low temperature and anaerobiosis favour decomposition
(c) Warm and anaerobiosis favour decomposition as well as low temperature favours decomposition
(d) Warm and low temperature inhibit decomposition whereas anaerobiosis favours decomposition

18. _____ is the rate of production of organic matter by consumers.
(a) Primary productivity
(b) Secondary productivity
(c) Net primary productivity
(d) Gross primary productivity

19. Which of the following is not a characteristic of humus?
(a) It is rich in organic matter such as lignin and cellulose.
(b) It is collodial in nature and serves as a reservoir of nutrients.
(c) It is highly resistant to microbial action and undergoes slow decomposition.
(d) It is further degraded by the process of humification.

20. Percentage of photosynthetically active radiation (PAR) in the incident solar radiation is
(a) 1 - 5% (b) 2 - 10%
(c) less than 50 % (d) approx. 100%

21. 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

22. In lithosere, foliose lichens make the conditions favourable for the growth of
(a) crustose lichens (b) mosses
(c) annual grasses (d) perennial grasses

23. Which one of the following is not one of the three aspects studied in biogeochemical cycling?
(a) The nature and size of natural reservoir
(b) The rate of movement between reservoirs
(c) How different biogeochemical cycles interact
(d) How new species create their own biogeochemical cycles

RESPONSE GRID

9. ⓐⓑⓒⓓ	**10.** ⓐⓑⓒⓓ	**11.** ⓐⓑⓒⓓ	**12.** ⓐⓑⓒⓓ	**13.** ⓐⓑⓒⓓ
14. ⓐⓑⓒⓓ	**15.** ⓐⓑⓒⓓ	**16.** ⓐⓑⓒⓓ	**17.** ⓐⓑⓒⓓ	**18.** ⓐⓑⓒⓓ
19. ⓐⓑⓒⓓ	**20.** ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ

24. The largest ecosystem of the world is-
(a) Forests (b) Grasslands
(c) Great lakes (d) Oceans

25. Which of the following is a man made artificial ecosystem?
(a) Grassland ecosystem
(b) Agro ecosystem
(c) Ecosystem of artificial lakes and dams
(d) Forest ecosystem

26. What is the annual net primary productivity of whole biosphere?
(a) 170 billion tons (dry weight) of organic matter
(b) 165 billion tons (dry weight) of organic matter
(c) 160 billion tons (dry weight) of organic matter
(d) 155 billion tons (dry weight) of organic matter

27. Select the formula for ecological efficiency

(a) $\frac{\text{Gross primary productivity} \times 100}{\text{Incident total solar radiation}}$

(b) $\frac{\text{Food primary assimilated} \times 100}{\text{Food energy ingested}}$

(c) $\frac{\text{Net primary productivity} \times 100}{\text{Gross primary productivity}}$

(d) $\frac{\text{Energy in biomass production at a trophic level} \times 100}{\text{Energy in biomass production at previous trophic level}}$

28. Vegetation of a geographic region with low rainfall, high temperature, loose and sandy soil is of the type called:
(a) grassland (b) scrub forest
(c) xerophytic (d) evergreen tropical forest

29. Which one is nature's cleaner ?
(a) Consumers
(b) Producers
(c) Decomposers and scavengers
(d) Symbionts

30. Which one of the following statement is correct?
(a) Decomposition rate is slower if detritus is rich in lignin and chitin, and quicker, if detritus is rich in nitrogen and water - soluble substances like sugars.
(b) Decomposition rate is slower if detritus is rich in nitrogen and water - soluble substances like sugars, and quicker, if detritus is rich in lignin and chitin.
(c) Decomposition rate is slower if detritus is rich in cellulose, and quicker, if detritus is rich in phosphorus.
(d) Decomposition rate is quicker if detritus is rich in lignin, and quicker, if detritus is rich in sulphur.

31. What are the two most important climatic factors that regulate decomposition through their effects on soil microbes ?
(a) Temperature and rainfall
(b) Temperature and soil - moisture
(c) Temperature and humidity
(d) Temperature and pressure

32. Which of the following process helps in nutrient conservation?
(a) Mineralisation (b) Immobilisation
(c) Leaching (d) Nitrification

33. Bacteria and fungi in a forest ecosystem are generally
(a) Producers
(b) Decomposers
(c) Primary consumers
(d) Secondary consumers

34. 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

35. In grass-deer-tiger food chain, grass biomass is one tonne. The tiger biomass shall be
(a) 100 kg (b) 10 kg
(c) 200 kg (d) 1 kg

36. The early settlers on a barren area (rock) are
(a) Ferns (b) Mosses
(c) Lichens (d) Diatoms

37. A community which starts succession in a habitat is
(a) Pioneer community (b) Seral community
(c) Biotic community (d) Ecosere

38. Last stabilised community in a plant succession is known as
(a) Seral community (b) Pioneer community
(c) Ecosere (d) Climax community

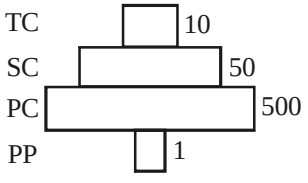
39. Identification and enumeration of plant and animal species of an ecosystem gives its
(a) productivity (b) stratification
(c) species composition (d) all of these

RESPONSE GRID					
	24. (a)(b)(c)(d)	**25.** (a)(b)(c)(d)	**26.** (a)(b)(c)(d)	**27.** (a)(b)(c)(d)	**28.** (a)(b)(c)(d)
	29. (a)(b)(c)(d)	**30.** (a)(b)(c)(d)	**31.** (a)(b)(c)(d)	**32.** (a)(b)(c)(d)	**33.** (a)(b)(c)(d)
	34. (a)(b)(c)(d)	**35.** (a)(b)(c)(d)	**36.** (a)(b)(c)(d)	**37.** (a)(b)(c)(d)	**38.** (a)(b)(c)(d)
	39. (a)(b)(c)(d)				

40. Which of the following factors influence communities ?
(i) Climate
(ii) Species interaction
(iii) Feeding relationships among organisms
(iv) Succession
(a) (i) and (iii) (b) (i) and (iv)
(c) (i), (ii) and (iii) (d) All of these

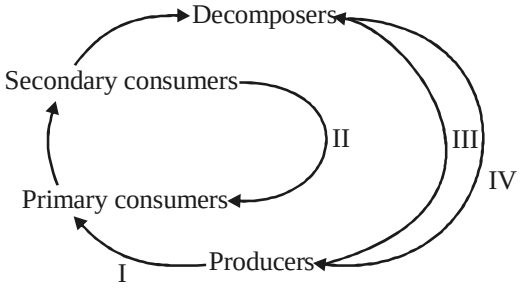
41. Grasslands can support greater grazing rates by herbivores than forests because
(a) net production of grassland is greater.
(b) more of the grassland is above the ground.
(c) grasslands receive more sunlight.
(d) grasslands produce less woody plant tissue.

42. 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 "whale" is on top level TC.
(c) Level PP is "peepal trees" and the level SC is "sheep".
(d) Level PC is "rats" and level SC is "cats".

43. The given diagram shows (I, II, III, and IV) the flow of materials between different trophic levels. Which arrow is incorrect?



(a) I (b) II
(c) III (d) IV

44. Match the following and choose the correct option.

	Column - I		Column - II
A.	Presence of 3-4 storey of plants grown in a forest	I.	Blue-green algae
B.	A biome having grasses with scattered trees	II.	Stratification
C.	Man made ecosystem	III.	Savannah
D.	Pioneer in hydrosere	IV.	Dam

(a) A – III; B – II; C – IV; D – I
(b) A – III; B – I; C – IV; D – II
(c) A – I; B – III; C – II; D – IV
(d) A – II; B – III; C – IV; D – I

45. The correct order of the process of decomposition is
(a) Catabolism → Fragmentation → Leaching → Humification → Mineralization
(b) Catabolism → Fragmentation → Humification → Leaching → Mineralization
(c) Fragmentation → Humification → Catabolism → Leaching → Mineralization
(d) Fragmentation → Leaching → Catabolism → Humification → Mineralization

RESPONSE GRID	**40.** ⓐⓑⓒⓓ **41.** ⓐⓑⓒⓓ **42.** ⓐⓑⓒⓓ **43.** ⓐⓑⓒⓓ **44.** ⓐⓑⓒⓓ **45.** ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 36 - BIOLOGY			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	50	Qualifying Score	70
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

HINTS & SOLUTIONS

DPP /CB36

1. (c) 2. (b)

3. (a) A blanket of air surrounding the earth is called as atmosphere and it is divided into different strata (zone). The zone of atmosphere that lies near the ground is troposphere.

4. (b) Detritus food chain begins with dead organic matter of dead plant parts, animals and their excretory product which is being acted upon by decomposers such as saprophytes to obtain energy needed for their survival.

5. (b) Biogeochemical cycles : Two types :

(i) Gaseous : Biogenetic materials involved in circulation are gases *e.g*. N_2, O_2, CO_2 *etc.*

(ii) Sedimentary : Biogenetic materials involved in circulation are non-gaseous *eg*. P, Ca, S etc. form rocks.

6. (a) A standing crop is the quantity or total weight or energy content of the organism, which are in a particular location at a particular time.

7. (c) The decomposers act on the dead organic matter and break them down into simpler compounds and minerals.

8. (d) In soil science, humus refers to any organic matter which has reached a point of stability where it will break down no further and might, if conditions do not change, remain essentially as it is for centuries, if not millennia. In agriculture, humus is sometimes also used to describe mature compost, or natural compost extracted from a forest or other spontaneous source for use to amend soil. It is also used to describe a topsoil horizon that contains organic matter (humus type, humus form, humus profile).

9. (b) The rate at which organic molecules are formed in a green plant is called gross productivity.

10. (a) An ecosystem having low stability can be easily damaged. An ecosystem having high resilience will take less time to recover.

11. (a) Hydrarch succession takes place in wetter areas and xerarch succession respectively, which takes place in dry areas. So, both hydrarch and xerarch successions leads to medium water conditions.

12. (c) Coral reefs are often called “rainforest of the sea”. It forms some of the most diverse ecosystem on earth. Coral reef ecosystem have the highest gross primary productivity in the sea.

13. (c) Polar ice caps & glaciers have the largest amount of pure and fresh water without any dissolved salt or impurity.

14. (d) Four important functional aspects of the ecocystem are (i) Productivity (ii) Decomposition, (iii) Energy flow and (iv) Nutrient cycling.

15. (a) 16. (a) 17. (a)

18. (b) The rate at which food energy is assimilated at the trophic level of consumers is called secondary productivity. In other words, the rate of synthesis of organic matter by consumers is called as secondary productivity. The primary producers have produced the food for consumers, and secondary productivity reflects only the utilization of this food for the production of consumer biomass.

19. (d) Humus constitutes the organic component of soil and is rich in lignin and cellulose. Humus is formed from organic remains through the activity of decomposer microorganisms. Process of formation of humus from raw organic remains is called humification. Humus is quite resistant to microbial action.

20. (c) Less than 50% of the solar energy incident over earth is present in PAR (photosynthetically active radiation).

21. (a) A single species may occupy more than one trophic level. Sparrow can be a primary consumer if it feeds on seeds, fruits and peas or a secondary consumer if it feeds on insects and worms.

22. (b) Secondary sucession (= subsere) is the biotic succession that occurs in an area which become secondarily bare due to the destruction of community previously present there. Secondary succession starts from previously built up substrata with already existing living matter. The action of any external force, such as sudden change in climatic factors, biotic intervention, fire, etc. had resulted in the destruction of previous community. Thus, area become devoid of living matter but its substratum, instead of primitive, is built up. It has organic matter so is biologically fertile and thus the successions are comparatively more rapid.

23. The cycling pool of carbon consists of 6×10^{14} kg (29%) of free CO_2 in the atmosphere, 1.45×10^{15} kg (71%) of dissolved CO_2 occurs in the oceans. Oceans also regulate the amount of CO_2 in the atmosphere.

24. (d) **25. (b)** **26. (a)** **27. (d)** **28. (c)**

29. (c) **30. (a)** **31. (b)** **32. (b)** **33. (b)**

34. (b) Phosphorus is mostly used as phosphate. Its reservoir pool is phosphate rocks while cycling pool is soil for terrestrial ecosystems and water for aquatic ecosystems.

35. (b) Only 10% of the mass is flown from one trophic level to another in the form of energy.

36. (c) Lichens are the early settlers on a barren area because they can tolerate desiccation, heating during summer noon or excessive cooling during winter nights. They secrete lichen acids and carbonic acid. The acids slowly corrode rock surface and release minerals required for proper growth of lichens.

37. (a) The first biotic community which develops in a bare area is called pioneer community. It has very little diversity. This stage takes the longest time to change the environment for invasion of the next community.

38. (d) Climax community is the stable, self perpetuating and final biotic community that develops at the end of biotic succession and is in perfect harmony with the physical environment.

39. (c) Identification and enumeration of plants and animal species of an ecosystem gives its species composition.

40. (d) Communities is an assemblage of interacting populations occupying a given area. Climate, species interaction, feeding relationship among organisms and succession are the factors which influence communities.

41. (d) Grassland can support greater grazing rates by herbivores than forests because grassland produces less woody plant tissue.

42. (a)

43. (c) Arrow III is incorrect.

44. (d) A : Presence of 3 - 4 storeys of plant grown in a forest is called stratification.
B : A biome having grasses with scattered trees is called savannah.
C : Man made ecosystem is dam. Man - made ecosystem are the artificial ecosystems which rely on the human efforts to sustain.
D : Pioneer in hydrosere is blue green algae.

45. (d) Decomposition involves breakdown of complex organic matter by decomposer to inorganic raw materials like CO_2, water & various nutrients. It consists of the following processes:
Fragmentation : It is the formation of smaller pieces of dead organic matter or detritus by detritivores.
Catabolism : Chemical conversion of detritus into simpler inorganic substances with the help of bacterial and fungal enzymes is called catabolism.
Leaching : Water soluble substances (formed as a result of decomposition) are leached to deeper layers of soil.
Humification : If decomposition leads to the formation of colloidal organic matter (humus), the process is called humification.
Mineralization : Formation of simpler inorganic substances (like CO_2, water and minerals) is termed mineralization.