

QUESTION BANK
SEMESTER IV
CORE COURSE-8

Plant Geography, Ecology & Evolution (BOT-A-CC-4-8-TH)

Plant Geography-

Short answer type questions- (1 or 2 marks):-

1. Name two authors who classified India into different phytogeographical regions.
2. What is Mangrove vegetation?
3. What is meant by Physiological dry soil?
4. Define Endemism.
5. Who has proposed the Epibiotic Theory of endemism?
6. Who has proposed the age and area hypothesis on endemism?

Short Note Type Questions: (5 Marks)-

1. Discuss the factors responsible for endemism.
2. Explain the Epibiotic Theory of endemism.
3. Describe the Age and Area hypothesis about endemism.
4. Discuss the dominant flora of Western Himalaya.

Broad Answer Type Questions: (10 Marks)-

1. Describe the phytogeographical regions of India according to the D. Chatterjee (1960) with representation of a suitable map.
2. Discuss the range of plant species present in Western Himalaya.
3. Describe the dominant flora present in the Sundarbans.
4. Discuss the range of dominant flora of Eastern Himalayan region.
5. Write an elaborate note on endemism in Indian flora.
6. Describe the different factors responsible for endemism. Write a note on Age and Area hypothesis.

Ecology-

Answer following questions: (each carries 1 mark)

- 1) What do you mean by ecological niche?
- 2) Mention the competitive ecological niche.
- 3) What do you mean by realized niche?
- 4) What do you mean by fundamental niche?
- 5) Who coined the term 'ecological niche'?
- 6) Who proposed fundamental and realized niche for the first time?
- 7) Define ecotone.
- 8) What do you mean by 'Edge effect'?
- 9) Who are 'edge species'?

- 10) What is ecocline?
- 11) Define microclimate.
- 12) What is ecad?
- 13) Define ecotype.
- 14) Who proposed 'micro-climate' in ecology first time?
- 15) -----is a local sets of atmospheric conditions that differ from those in the surrounding areas.
- 16) 'Urban Heat island' is a kind of
- 17) Who wrote the book "Climates in Miniature: A study of Micro-Climate environment".
- 18) What is 'Zone of tension'?
- 19) Mangrove forests represent an ecotone between marine andecosystems.
- 20) Marsh land represents an ecotone betweenand.....ecosystems.
- 21) River bank represents an ecotone betweenand.....ecosystems.
- 22) Define succession.
- 23) What is primary succession?
- 24) Name the substratum where primary succession begins.
- 25) Name the area/substratum where secondary succession begins.
- 26) Define autogenic succession,
- 27) Define allogenic succession.
- 28) What do you mean by the term 'sere'?
- 29) What do you mean by 'seral stages'?
- 30) Define Hydrosere/Hydrach.
- 31) Mention the pioneer community/seral stage of a hydrosere originating in a pond.
- 32) Mention the climax community/seral stage/final stage of a hydrosere occurring in any water bodies.
- 33) Name the amphibious seral stage of hydrosere originating in a pond ecosystem.
- 34) Mention one plant species involved in 'Rooted submerged stage' of hydrosere.
- 35) Mention one plant species involved in 'Rooted Floating stage' of hydrosere.
- 36) Mention the seral stage of hydrosere originating in a pond ecosystem where mineralization of the soil favouring arrival of new tree species.
- 37) Define community.
- 38) What do you mean by population?
- 39) Define ecosystem.
- 40) What is beta diversity?
- 41) What is gamma diversity?
- 42) What is alpha diversity?
- 43) What do you mean by metallophytes?
- 44) Cite one example of metallophyte.
- 45) Name a gold indicating plant.
- 46) Name a silver indicating plant.
- 47) Name a mercury indicating plant.
- 48) Name a copper indicating plant.
- 49) What is phytoremediation?
- 50) Mention one plant species commonly used in phytoremediation process.
- 51) Define biodiversity.
- 52) What is ecosystem diversity?
- 53) What is species diversity?
- 54) What is genetic diversity?
- 55) Define biodiversity hotspot.
- 56) Name one Indian hotspot.
- 57) What is *in-situ* conservation?
- 58) What is *ex-situ* conservation?

- 59) Cite one example of *in-situ* conservation.
- 60) What is seed bank?
- 61) Define cryopreservation.
- 62) Mention the Biosphere Reserve nearest to you.

Answer following questions: (each carries 2 marks)

- 1) Differentiate between habitat and niche.
- 2) Differentiate between realized and fundamental niche
- 3) Explain carrying capacity.
- 4) Mention two important contributing factors of microclimate.
- 5) Is 'garden bed' considered as 'microclimate'? Why?
- 6) Mention two characteristics of an Ecotone.
- 7) What is estuary? Is it considered as ecotone? Justify your answer in one sentence.
- 8) Mention the types of edge effects.
- 9) Differentiate between autogenic and allogenic succession.
- 10) Differentiate between primary and secondary succession.
- 11) Mention different seral stages of Hydrosere.
- 12) Mention the pioneer community/phytoplanktonic seral stage members of hydrosere originating in a pond ecosystem.
- 13) Differentiate between alpha and gamma diversity in a community.
- 14) What do you mean by plant indicators? Cite one example.
- 15) Define metallophytes. Cite one example.
- 16) Differentiate between phytosequestration and phytostabilization.
- 17) Mention two plant species involved in active phytoremediation.
- 18) Differentiate between *ex-situ* and *in-situ* conservation.
- 19) Differentiate between species diversity and genetic diversity.
- 20) Differentiate between species diversity and ecosystem diversity
- 21) Mention two important criteria of hotspots.
- 22) Mention Indian Biodiversity hotspots.
- 23) Differentiate between National park and wildlife sanctuary.
- 24) Mention two Indian Biosphere Reserve.

Write short notes on the following: (each carries 5 marks)

- 1) Ecotone
- 2) Microclimate
- 3) Carrying capacity.
- 4) Edge effect
- 5) Community characteristics
- 6) Community diversity.
- 7) Metallophytes
- 8) Phytoremediation.
- 9) Biodiversity hotspots
- 10) Levels of biodiversity
- 11) Seed bank & Cryopreservation 2+3 = 5
- 12) Biosphere Reserve
- 13) *in-situ* conservation.
- 14) *ex-situ* conservation.

Answer following broad questions: (each carries 10 marks)

1. Define Hydrosere. Briefly describe different seral stages of hydrosere originating in a pond ecosystem with suitable line diagrams. $1+9 = 10$.
2. Define community. Describe briefly six important community characteristics. Define three important diversities at community level. $1+6+3=10$.
3. What do you mean by plant indicators? Define metallophytes. Describe different metallophytes with one example for each. $1+1+8=10$.
4. What is phytoremediation? Describe various processes of Phytoremediation. $2+8=10$.
5. Define Biodiversity. Describe different levels of biodiversity. Mention Indian Biodiversity hotspots regions. Mention the role of seed banks and cryopreservation. $1+5+2+2 = 10$
6. Define biodiversity hotspots. Mention Indian biodiversity hotspots. Mention the criteria of biodiversity hotspots. Write short note on *in-situ* conservation. $1+2+2+5 = 10$.

Evolution-

Answer following questions: (each carries 1 mark)

1. Define evolution
2. What is 'Lamarckism'?
3. Who proposed the 'Theory of Natural Selection'?
4. Who proposed the "Theory of inheritance of acquired characters"?
5. Who proposed the "Theory of use and disuse of organs."?
6. Who criticized boldly Lamarckism?
7. Who proposed the "Theory of continuity of germplasm"?
8. Lamarckism was rejected by the experimental work of whom?
9. Define Neo-Lamarckism.
10. Who proposed "Principle of Natural Selection"?
11. Who proposed "Mutation Theory of Evolution"?
12. What do you mean by Neo-Darwinism/Synthetic Theory of Evolution?
13. Mention one supporter/Contributor of Neo-Darwinism.
14. Define Natural Selection.
15. Who introduced 'Neutral Theory of Molecular Evolution'?
16. Who proposed 'concept of Kin Selection'?
17. What do you mean by 'Group Selection'?
18. Define anagenesis.
19. What is 'punctuated equilibrium'?
20. What is stasis?
21. Define cladogenesis.

22. Who proposed 'Punctuated equilibrium'?
23. Who first proposed 'Sexual selection'?
24. What is stabilizing selection?
25. What is directional selection?
26. What is disruptive/diversifying selection?
27. Define speciation.
28. What is sympatric speciation?
29. What is allopatric speciation?
30. What do you mean by 'Reproductive isolation'?
31. What is adaptive radiation?
32. What do you mean by phylogenetic tree/evolutionary tree?
33. Define outgroup.
34. Name the one bacteria fossil.
35. Name the lineage from which bacteria diverged first.
36. Name the most recent common ancestor of Bacteria and Archaea.
37. Name the earliest life on land about 3.2 billion years ago.
38. Name the most primitive fungi.
39. Name the ancestor of fungi.
40. Name the advanced group of Fungi.
41. Name the ancestor of all Fungi, Plants and animal groups about 1 billion year ago.
42. Who are Archaeplastida/Plantae?
43. Who are Viridiplantae?

Answer following questions: (each carries 2 mark)

1. Mention different theories of organic evolution.
2. What is the theme of Darwinism?
3. Explain 'speciation' as postulated by Lamarck.
4. Mention the supporters/contributors of Neo-Lamarckism.
5. Mention the postulates of Darwinism.
6. What do you mean by 'sports' as coined by Darwin?
7. Mention two key concepts of Darwinian Theory of Evolution.
8. How 'Natural Selection of Neo-Darwinism' differentiated from 'Natural Selection of Darwinism'?
9. Explain Genetic Drift.
10. Explain Reproductive Isolation.
11. What do you mean by 'Neutral Theory of Molecular Evolution'?
12. Define neutral mutation.
13. Explain Phyletic Gradualism.
14. How 'Phyletic Gradualism' is differentiated from 'Punctuated Equilibrium'?
15. Explain stasis in Evolutionary Biology.
16. Is 'Punctuated Equilibrium' accepted?
17. What is the hypothesis of Punctuated Equilibrium?
18. What would cause Punctuated Equilibrium?
19. What is true about the theory of Punctuated Equilibrium?
20. Did Darwin believe in Punctuated Equilibrium?

21. How 'Stabilizing selection' is differentiated from 'Directional selection'?
22. Differentiate between sympatric & allopatric speciation.
23. Define coevolution.
24. Differentiate between rooted and unrooted trees.

Write short notes on the following: (each carries 5 marks)

1. Theories of organic Evolution.
2. Four postulates of Lamarckism.
3. Neo-Lamarckism.
4. Natural selection/Survival of the fittest
5. Define speciation as explained by Darwin.
6. Evidences against Darwinism (only mention).
7. Mutation Theory of Evolution.
8. Conclusions of Mutation Theory of Evolution.
9. Evidences in favour of Mutation Theory.
10. Evidences against Mutation Theory.
11. Postulates of Neo-Darwinism.
12. Neutral Theory of Molecular Evolution.
13. Group Selection.
14. Phyletic Gradualism.
15. Punctuated Equilibrium
16. Sexual selection
17. Stabilizing selection
18. Directional selection.
19. Disruptive selection.
20. Sympatric speciation
21. Allopatric speciation.
22. Coevolution.
23. Adaptive Radiation.
24. Phylogenetic tree

Answer following broad questions: (each carries 10 marks)

1. Define organic evolution. Briefly describe different Theories of organic evolution . 2+8=10
2. Explain Darwinism. Briefly describe different postulates of Darwinism. 2+8=10
3. Explain Neo-Darwinism. Describe briefly Neo-Darwinism/Synthetic Theory of Evolution. 2+8=10
4. Briefly describe different postulates of Synthetic Theory of Evolution.
5. How is 'Punctuated Equilibrium differentiated from 'Phyletic Gradualism'? Briefly describe 'Punctuated Equilibrium' and 'Phyletic Gradualism' hypotheses in evolutionary biology.
6. Define speciation. Describe briefly sympatric and allopatric speciations with one example for each. What is coevolution? 1+8+1=10
7. Explain adaptive radiation citing one example in favour of plant? Mention four important features of Adaptive Radiation. Describe briefly mechanism of adaptive radiation. What is Reproductive isolation? 3+2+4+1=10.