Unit 9.1. MCQs Set 1

Results

#1. Q1. Biodiversity refers to the variety and variability of living organisms. Which of the following levels of biodiversity is not typically recognized?

☐
(A). Genetic diversity
☐
(B). Species diversity
☐
(C). Ecosystem diversity
☐
(D). Solar diversity

Biodiversity is generally recognized at three levels—genetic, species, and ecosystem diversity; “solar diversity” is irrelevant.

#2. Q2. Identify the incorrect statement regarding biodiversity of medicinal plants:

☐
(A). Medicinal species can be threatened by overharvesting
☐
(B). They only occur in tropical forests and never in temperate zones
☐
(C). Many have unique secondary metabolites with therapeutic value
☐
(D). Conservation ensures sustainable availability for future generations

Medicinal species grow in a variety of climatic conditions, not exclusively in the tropics.

#3. Q3. Fill in the blank: The approach that promotes people’s well-being by maintaining and improving environmental conditions is known as _____.

☐
(A). Occupational Health
☐
(B). Social Health
☐
(C). Environmental Health

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☐
(D). None

Environmental health addresses how air, water, and soil quality impact human well-being.

#4. Q4. Which of these is a primary metabolite in plants?

☐
(A). Terpenoids
☐
(B). Phenolics
☐
(C). Carbohydrates
☐
(D). Alkaloids

Primary metabolites like carbohydrates are essential for basic cellular growth and function; the others are secondary metabolites.

#5. Q5. Secondary metabolites like alkaloids and flavonoids in medicinal plants are mainly produced for:

☐
(A). Photosynthetic activity
☐
(B). Essential cell division processes
☐
(C). Defense, protection, or attracting pollinators
☐
(D). None

Secondary metabolites are mainly produced for defense, protection, or reproductive interactions (e.g., attracting pollinators).

#6. Q6. Match the items in Column I (types of secondary metabolites) with Column II (examples): Column I: Alkaloids, Terpenoids, Phenolics Column II: (A). Curcumin, (B). Vincristine, (C). Menthol; Options: (A) 1–b, 2–c, 3–a; (B) 1–c, 2–a, 3–b; (C) 1–a, 2–b, 3–c; (D) 1–b, 2–a, 3–c

☐
(A). 1–b, 2–c, 3–a
☐
(B). 1–c, 2–a, 3–b
☐
(C). 1–a, 2–b, 3–c
☐
(D). 1–b, 2–a, 3–c

Vincristine (an alkaloid), Menthol (a terpenoid), and Curcumin (a phenolic) are correctly paired in option A.

#7. Q7. In an ecosystem, energy generally flows:

☐
(A). From higher trophic levels to producers
☐
(B). From producers to consumers to decomposers
☐
(C). From carnivores directly to omnivores only
☐
(D). Equally in all directions

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Energy flows from autotrophs (producers) through various trophic levels, with decomposers recycling nutrients.

#8. Q8. A food web differs from a food chain mainly by:

☐
(A). Showing just a single linear pathway
☐
(B). Interlinking multiple feeding pathways among various organisms
☐
(C). Being specific to aquatic ecosystems only
☐
(D). None

A food web is a more complex network of feeding relationships compared to a single linear food chain.

#9. Q9. Fill in the blank: _____ is the gradual process of change in species composition of a community over time, leading from pioneer to climax stages.

☐
(A). Ecological succession
☐
(B). DNA replication
☐
(C). RNA synthesis
☐
(D). Mitosis

Ecological succession describes the gradual change in species composition in an ecosystem over time.

#10. Q10. Reasoning Type – Assertion: India is termed a mega-biodiversity nation. Reason: It has extremely low endemism and few habitats.

☐
(A) Both A and R true, R explains A
☐
(B) Both A and R true, but R does not explain A
☐
(C) A true, R false
☐
(D) A false, R true

India is mega-diverse due to high endemism and varied habitats; the reason given (low endemism) is false.

#11. Q11. Which of these is a biodiversity hotspot in India?

☐
(A). Indo-Gangetic plains exclusively
☐
(B). Western Ghats
☐
(C). Deccan plateau alone
☐
(D). Arctic tundra

The Western Ghats are a recognized global biodiversity hotspot in India.

#12. Q12. Non-renewable biological resources are generally:

☐
(A). Replenished quickly

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☐
(B). Exhaustible, e.g., certain fossil-based resources
☐
(C). Minimal synergy
☐
(D). Not renewable over short time scales

Non-renewable resources do not replenish quickly and include resources like fossil fuels.

#13. Q13. Fill in the blank: Excessive deforestation and habitat destruction leads to _____, where local biodiversity is lost, harming indigenous knowledge and livelihoods.

☐
(A). Regeneration of biodiversity
☐
(B). Degradation of biodiversity
☐
(C). Environmental Health
☐
(D). None

Habitat destruction leads to degradation of biodiversity, disrupting ecosystem services and cultural practices.

#14. Q14. A key factor in “environmental health” is:

☐
(A). None
☐
(B). Controlling pollution, sanitation, and ensuring safe water and living conditions
☐
(C). Inadequate waste management practices
☐
(D). Infect illusions

Proper environmental health involves managing pollution, sanitation, and safe water supplies.

#15. Q15. If an area experiences the overharvesting of a medicinal plant, which immediate risk is likely?

☐
(A). None
☐
(B). Species population collapse, leading to loss of local remedies and genetic erosion
☐
(C). Temporary market shortage due to supply-demand imbalance
☐
(D). Increased export opportunities

Overharvesting can result in population collapse, reducing the species’ availability and genetic diversity.

#16. Q16. Which statement about “pharmacological properties” of secondary metabolites is incorrect?

☐
(A). Some can have antimicrobial, anti-inflammatory, or antioxidant effects
☐
(B). They cannot be used for any therapeutic purpose
☐
(C). They often form the basis of active principles in herbal medicines
☐
(D). None

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It is incorrect to state that secondary metabolites cannot be used therapeutically; many are central to herbal medicine.

#17. Q17. Name one important secondary metabolite from an Ayurvedic medicinal plant and its known therapeutic property.

☐
(A). Andrographolide from Andrographis paniculata
☐
(B). Mercury in Rasa medicine
☐
(C). Swaras extracted fresh leaves
☐
(D). Decoction of dried herbs

Andrographolide from Andrographis paniculata, which has hepatoprotective and anti-inflammatory effects.

#18. Q18. In an ecosystem, decomposers are crucial because:

☐
(A). None
☐
(B). They break down dead organisms, recycling nutrients back into the soil
☐
(C). They reduce soil fertility
☐
(D). They cause rapid decay of biomass

Decomposers recycle nutrients by breaking down organic matter, sustaining soil fertility.

#19. Q19. Fill in the blank: The practice of preserving biodiversity by maintaining habitats in their natural state is termed _____ conservation.

☐
(A). In situ
☐
(B). In vivo
☐
(C). In vitro
☐
(D). None

In situ conservation retains species within their natural habitats such as parks and sanctuaries.

#20. Q20. “Ex situ” conservation typically means:

☐
(A). None
☐
(B). Protecting biodiversity outside its natural habitat (e.g., seed banks, botanical gardens)
☐
(C). Storing species in artificial environments that do not support long-term survival
☐
(D). Traditional farming practices

Ex situ conservation involves protecting species through methods like seed banks and botanical gardens, away from their natural habitats.

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#21. Q21. Which is a recognized cause of biodiversity loss?

☐
(A). Enhanced pollinator populations
☐
(B). Habitat fragmentation, climate change, and invasive species
☐
(C). Low genetic diversity
☐
(D). Uniform weather conditions

Habitat fragmentation, climate change, and invasive species are well-documented causes of biodiversity loss.

#22. Q22. “Shifting cultivation,” if unmanaged, might lead to:

☐
(A). None
☐
(B). Deforestation, soil erosion, and loss of local flora and fauna
☐
(C). Increased crop yields
☐
(D). Improved soil fertility

Unmanaged shifting cultivation can result in deforestation and soil erosion, leading to biodiversity loss.

#23. Q23. Among levels of biodiversity, “genetic diversity” is important because:

☐
(A). None
☐
(B). It enables species to adapt to changing environments and resist diseases
☐
(C). Lack of variation makes species stronger
☐
(D). It has no practical importance

Genetic diversity is crucial for species adaptation and resilience against environmental changes and diseases.

#24. Q24. Reasoning Type – Assertion: India is termed a mega-biodiversity nation. Reason: Distinct climate zones and ancient cultural traditions promoted varied herbal usage.

☐
(A) Both A and R true, R explains A
☐
(B) Both A and R true, but R does not explain A
☐
(C) A true, R false
☐
(D) A false, R true

The Indian subcontinent’s diverse climates and long history of botanical knowledge drive high medicinal plant diversity.

#25. Q25. The Western Ghats region is considered a biodiversity hotspot because:

☐
(A). None
☐
(B). It hosts high endemism, threatened habitat, and numerous medicinal species
☐
(C). It is dominated by extensive agricultural land

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☐
(D). It has uniform topography

The Western Ghats have a high number of endemic species and face significant environmental pressure.

#26. Q26. “Keystone species” in an ecosystem refers to:

☐
(A). None
☐
(B). A species with a disproportionate effect on its environment relative to its abundance
☐
(C). A species with the highest biomass
☐
(D). A species that is genetically identical to others

Keystone species have a critical and disproportionate impact on ecosystem structure and function.

#27. Q27. Fill in the blank: _____ is the practice of using minimal or no chemicals in farming, promoting soil biodiversity and environmental health.

☐
(A). Organic Farming
☐
(B). Use of fertilizers
☐
(C). Grafting
☐
(D). None

Organic farming relies on natural processes and inputs to promote soil health and biodiversity.

#28. Q28. A direct consequence of losing medicinal fauna (e.g., leeches, bees) includes:

☐
(A). None
☐
(B). Loss of ecosystem services (such as pollination and biological control) and traditional therapies
☐
(C). Increased invasive species pressure
☐
(D). Economic benefits from synthetic replacements

Medicinal fauna often contribute to ecosystem services and traditional healing practices.

#29. Q29. “Sacred groves” in some parts of India function to:

☐
(A). None
☐
(B). Conserve biodiversity through cultural or religious practices that restrict exploitation
☐
(C). Serve as urban green spaces for recreation
☐
(D). Be developed for commercial agriculture

Sacred groves are preserved due to cultural traditions and serve as reservoirs of biodiversity.

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#30. Q30. Over-harvesting of rare medicinal plants like Picrorhiza kurroa (Kutki) leads to:

☐
(A). None
☐
(B). Population decline, potential extinction, and diminished resource for future drug discovery
☐
(C). Temporary shortages with quick recovery
☐
(D). Enhanced natural regeneration

Unsustainable harvesting practices can lead to long-term declines and even local extinction of species.

#31. Q31. Name one negative effect of biodiversity degradation on indigenous knowledge systems.

☐
(A). Loss of essential plant species can erode local healthcare practices and cultural identity.
☐
(B). It will help ecosystem to maintain the biodiversity
☐
(C). The Darwin’s principle will not match with the statement
☐
(D). There will be no negative impact

Communities reliant on unique remedies can lose them if habitats are destroyed.

#32. Q32. The concept of an “ecosystem service” includes:

☐
(A). None
☐
(B). Benefits such as pollination, water purification, nutrient cycling, and climate regulation provided by ecosystems
☐
(C). Increased industrial productivity
☐
(D). Higher urban development

Ecosystem services refer to the various benefits that ecosystems provide to humans and the environment.

#33. Q33. “Megadiversity” countries are recognized by:

☐
(A). None
☐
(B). Having exceptionally high species counts, endemism, and varied ecosystems
☐
(C). Constant climate throughout the year
☐
(D). Low levels of genetic diversity

Megadiversity countries have a high number of species and unique ecosystems; India is one of them.

#34. Q34. Primary production in an ecosystem is performed by:

☐
(A). None
☐
(B). Autotrophs (plants, algae) converting solar energy into chemical energy
☐
(C). Heterotrophs exclusively

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☐
(D). Decomposers

Autotrophs, such as green plants, are responsible for primary production via photosynthesis.

#35. Q35. Fill in the blank: _____ species are non-native organisms introduced into new areas, potentially outcompeting local species and reducing biodiversity.

☐
(A). Endemic
☐
(B). Invasive alien
☐
(C). Keystone
☐
(D). Indicator

Invasive alien species are those non-native organisms that can dominate new habitats and harm native biodiversity.

#36. Q36. If an environment changes from grassland to a forest over decades, it’s an example of:

☐
(A). None
☐
(B). Succession
☐
(C). Rapid species extinction
☐
(D). Abrupt ecological collapse

Ecological succession is the gradual process through which a habitat develops over time.

#37. Q37. “Renewable resources” like bamboo or certain medicinal plants require:

☐
(A). None
☐
(B). Sustainable management to regrow, so as not to exceed their natural regeneration rate
☐
(C). Immediate replanting without rest period
☐
(D). Chemical fertilizers for growth

Renewable resources must be managed sustainably to ensure that their rate of use does not exceed their natural regeneration.

#38. Q38. “Non-renewable resources” example is:

☐
(A). None
☐
(B). Petroleum or mineral deposits that cannot be quickly replenished
☐
(C). Rapidly regrowing forest products
☐
(D). Common agricultural crops

Non-renewable resources, such as fossil fuels and minerals, are not replenished on a human time scale.

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#39. Q39. A direct effect of climate change on medicinal plant biodiversity might be:

☐
(A). None
☐
(B). Shifts in growth zones, possibly mismatches with pollinators, leading to population decline
☐
(C). Increase in biomass production
☐
(D). Uniform global plant distribution

Climate change can alter the geographic distribution of species, leading to potential declines in medicinal plant populations.

#40. Q40. Reasoning Type – Assertion: Loss of biodiversity can reduce the discovery of new Ayurvedic remedies. Reason: Many medicinal leads come from a pool of diverse species with unique metabolites.

☐
(A) Both A and R true, R explains A
☐
(B) Both A and R true, but R doesn't explain A
☐
(C) A true, R false
☐
(D) A false, R true

High biodiversity increases the pool of potential therapeutic compounds; if species are lost, so are those potential leads.

#41. Q41. "Conservation of biodiversity" includes methods such as:

☐
(A). None
☐
(B). Protected areas (parks, sanctuaries), ex situ gene banks, and sustainable resource use laws
☐
(C). Commercial exploitation of natural resources
☐
(D). Unregulated tourism

Conservation of biodiversity employs protected areas, gene banks, and regulatory frameworks to maintain species and genetic diversity.

#42. Q42. Fill in the blank: India's _____ is a major institution that collects and conserves plant genetic resources, fostering crop biodiversity.

☐
(A). Indian Council of Agricultural Research (ICAR)
☐
(B). National Biodiversity Authority (NBA)
☐
(C). National Bureau of Plant Genetic Resources (NBPGR)
☐
(D). Botanical Survey of India (BSI)

NBPGR is a key institution in India responsible for the preservation and management of plant genetic resources.

#43. Q43. A "food chain" always starts with:

☐

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(A). None
☐
(B). Producers (green plants/algae)
☐
(C). Consumers
☐
(D). Decomposers

A food chain always begins with producers, which capture energy from the sun.

#44. Q44. “Endemic species” are those that:

☐
(A). None
☐
(B). Occur naturally in one geographic region and nowhere else
☐
(C). Are widely distributed around the globe
☐
(D). Have been introduced from other regions

Endemic species are unique to a specific geographic area and are often vulnerable to habitat loss.

#45. Q45. Overexploitation of Terminalia chebula or Phyllanthus emblica (commonly used in Ayurveda) could:

☐
(A). None
☐
(B). Result in scarcity, higher prices, and potential adulteration with inferior substitutes
☐
(C). Increase availability in the market
☐
(D). Enhance genetic diversity

Overharvesting can lead to scarcity and force the use of adulterants, compromising quality.

#46. Q46. “Concept of ecosystem” includes both structure and function. Function refers to:

☐
(A). None
☐
(B). Processes such as nutrient cycling, energy flow, trophic interactions, and matter recycling
☐
(C). Only the physical layout of species
☐
(D). Static habitat structure

Ecosystem function encompasses the processes that recycle nutrients and sustain energy flow within a habitat.

#47. Q47. Degradation of biodiversity can cause:

☐
(A). None
☐
(B). Erosion of indigenous knowledge, as plants and animals used in local medicine vanish
☐
(C). Increased urbanization
☐
(D). Enhanced global trade

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Loss of biodiversity directly impacts traditional knowledge systems by erasing the natural resources on which they depend.

#48. Q48. The term “biopiracy” arises if:

☐
(A). None
☐
(B). Traditional knowledge or resources are commercially exploited or patented without appropriate consent or compensation
☐
(C). There is overly strict patent enforcement
☐
(D). Public libraries are overburdened

Biopiracy refers to the unethical or illegal appropriation of indigenous knowledge or genetic resources without fair compensation.

#49. Q49. “India as a mega-biodiversity nation” implies:

☐
(A). None
☐
(B). India hosts roughly 8% of the world’s biodiversity with varied ecosystems and high endemism
☐
(C). India has low species diversity
☐
(D). India has no unique species

India is recognized as a megadiverse country due to its rich and varied biological resources.

#50. Q50. One recommended approach to sustain medicinal plant biodiversity is:

☐
(A). None
☐
(B). Cultivation of high-demand species, establishing community-based gene banks, reforestation, and regulated trade
☐
(C). Unregulated wild harvesting
☐
(D). Exclusive reliance on synthetic substitutes

Sustainable practices, including cultivation and community-based conservation, help maintain medicinal plant biodiversity without exhausting wild resources.

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