

PYQs SUMMERY

UPSC

INDIAN FOREST SERVICE

TOOLKIT

Detailed
Syllabus
Analysis

+

Topic wise
segregated
PYQs

+

Focusing
primarily on
the last 10 years

Paper - 1

- Silviculture
- Mangroves & Cold desert
- Silviculture system
- Silviculture of important Indian tree species
- Agroforestry, Social & Urban Forestry
- Indian tribes
- Joint Forest Movement (JFM)
- Environment & Pollution
- Tree improvement & Seed Technology
- Forest Soil, Conservation & Watershed Management



3

Anuradha Mishra



5

Ajay Gupta



6

Shobhit Joshi



11

Dinesh Jangid



17

Yash Dhoble



19

Udayan Subbudhi



23

Akarsh B.B.



24

Swarnadipta
Rakshit



26

Senthilkumar V



30

Suchet Balkal

35 Out of **149** Total Selections in

Indian Forest Service (IFoS) 2022



6

Ayush Krishna



9

Vinod Jakhar



10

Gurleen Kaur



11

Apoorv Dixit



30

Mohammed Abdul
Rawoof Shaik



32

Shinde Sandeep
Karbhari



35

Chandra Kumar
Agrawal



42

Anshul Tiwari



52

Vikas Yadav



57

Subburaj G

21 Out of **108** Total Selections in

Indian Forest Service (IFoS) 2021



1

Ashish Vijaywar



2

Ankit Kumar Jain



3

Sachindra
Singh Tomar



4

Shubham Soni



6

Rahul Chouhan

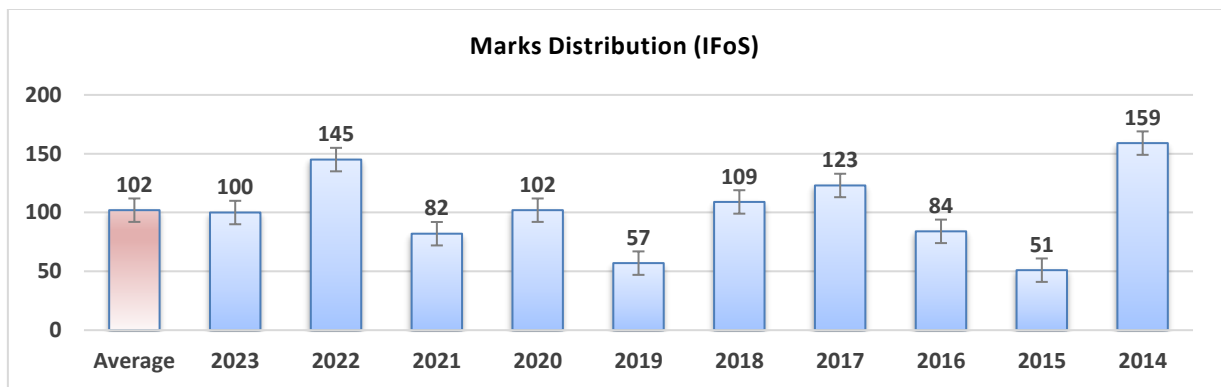
05 Out of **06** Total Selections in

Assistant Conservator of Forest (ACF)

MPPSC State Forest Service 2020

SILVICULTURE

General Silvicultural Principles : Ecological and physiological factors influencing vegetation, natural and artificial regeneration of forests; methods of propagation, grafting techniques; site factors; nursery and planting techniques. Nursery beds, polybags, and maintenance, water budgeting, grading and hardening of seedlings; special approaches; establishment and tending.



2023

- The shoot portion of seedlings of some tree species like Sal and Sandal, under natural regeneration, keeps on drying year after year but the roots remain alive. Discuss [8 M]
- Calculate the **quantity of seeds** (kg) required to establish a teak plantation over an area of 10 ha. [8 M]
- What is **frost hole**? How does frost affect regeneration? [8 M].
- Write the botanical names of three tree species each of [8 M]
 - (a) Non-coppicers,
 - (b) Poor coppicers,
 - (c) Good (fair) coppicers and
 - (d) Strong coppicers.
- Describe the **seed collection** and **storage methods** of the following tree species [15 M].
 - (i) *Santalum album*
 - (ii) *Chukrasia tabularis*
 - (iii) *Cedrus deodara*
 - (iv) *Azadirachta indica*
 - (v) *Dalbergia latifolia*
- Write the factors which affect the **natural regeneration** of Sal (*Shorea robusta*). Discuss the procedure to obtain natural regeneration of moist Sal forests [15 M].
- Explain the following [15 M].

	<ul style="list-style-type: none"> (a) Lignotuber (b) Root sucker (c) Vermiculite (d) Buttresses (e) Ortet and Ramet • Discuss the significance of <i>exotics</i> in tree improvement. Name four exotic tree species [Linked Q 8 M] • How does moisture influence the soil formation and growth of vegetation? [Linked Q 8 M] • What are <i>biofertilizers</i> ? Enlist the factors associated with the mycorrhizal development in trees. Discuss the types of mycorrhizae [15 M].
2022	<ul style="list-style-type: none"> • Explain the techniques for upgradation and <i>hardening of nursery seedlings of Lagerstroemia lanceolata</i> [8 M] • Discuss the <i>significance of bamboo flowering</i> [8 M] • Explain the following : (i) Selection felling, (ii) Regeneration felling, (iii) Selective felling, (iv) Enrichment Planting [Linked Q 10 M] • How are <i>nurseries classified</i> in India? What is a clonal nursery? Explain the nursery technique for <i>Casuarina equisetifolia</i> [15 M] • What is <i>precision silviculture</i>? Explain the silvicultural techniques for the following. [15] – (a) Dalbergia Sissoo, (b) Eucalyptus tereticornis • Explain the silvicultural practices that help in the <i>modification of site factors</i> in forestry [15 M] • Differentiate between thinning cycle and thinning intensity. Why is thinning essential for the management of <i>forest stand</i>? Describe the merits and demerits of French thinning [15 M] • What is <i>root : shoot cutting</i>? Write the names of five tree species which are propagated by this method [10 M] • How do <i>sacred groves</i> help in conservation of biodiversity? [8 M] • Explain the <i>role of mycorrhizae</i> in plant growth and development of forest trees [10 M] • What are the <i>biotic and abiotic stresses</i> on trees? Explain the responses of trees to these stresses [8 M]. • Describe the <i>adverse climatic factors</i> causing damage to forests [15 M]. • What are commensalism, Amensalism, Mutualism and symbiosis? Write the function of an ecosystem [10 M] • “Success of commercial forest plantations depends on site-specific and strategic planning” Justify the statement [8 M]
2021	<ul style="list-style-type: none"> • What factors are considered important while <i>choosing a species</i> under avenue plantation? [8 M] • Are <i>non-native</i> tree species an option or a threat in forest ecosystem / Plantation under climate change? [8 M] • Do the trees of same species have different response to <i>light conditions</i> at different ages ?

	<p>[8 M].</p> <ul style="list-style-type: none"> • What do you mean by <i>tending</i> operations? Enumerate various tending operations carried out in forest crops. Discuss improvement felling [15 M]. • Why is <i>grading</i> operation of nursery seedlings essential for successful forest plantations? [10 M]. • How are <i>forest sites</i> classified on the basis of vegetation? [10 M]. • What is <i>Site Quality Index</i> ? How does it differ from fractional site quality ? Explain any one method used for developing site quality classes with the help of neat diagram [15 M]. • What is meant by <i>climax</i> in ecological succession? Give an example and describe types of ecological succession [8 M].
2020	<ul style="list-style-type: none"> • Define <i>silviculture</i>. Relate the applications of silvicultural to different branches of forestry [8 M]. • Frost resistance in trees depends on the internal and external factors. Explain [8 M]. • Write the adaptive characteristics of plant species of <i>cold desert</i> [8 M]. • Describe the methods of <i>artificial regeneration</i> of <i>Tamarindus indica</i> [8 M]. • Describe the following terms [10 M] (a) Dominant, (b) Dominated, (c) Crop height, (d) Top height, (e) Hardening • Write down the pre-sowing seed treatments for the following tree species [15 M] [<i>Linked Q</i>]. (a) <i>Tectona grandis</i>, (b) <i>Santalum album</i>, (c) <i>Dalbergia sissoo</i>, (d) <i>Albizia lebbek</i>, (e) <i>Acacia nilotica</i>. • What are the different factors governing the successful <i>introduction of an exotic tree species</i>? [10 M]. • What are Orthodox and Recalcitrant seeds? Give five examples for each of these categories of seeds [10 M]. • How does slope aspect impact forest stand characteristics and soil properties? [10 M]. • What are the structural and functional changes that occur in a forest ecosystem during succession? [15 M].
2019	<ul style="list-style-type: none"> • Write <i>scientific names of four major tree species</i> in each of southern Tropical Semi-evergreen Forest and Northern Tropical Wet-Evergreen Forest [8 M]. • Explain the <i>modern nursery techniques</i> for the production of quality planting stock [8 M]. • Discuss the factors which influence the <i>choice between natural and artificial regeneration</i> [8 M]. • What are the <i>different types of grafting</i>? Explain 'Cleft Grafting' with neat sketches [8 M]. • Draw a schematic diagram showing <i>altitudinal zonation of forest vegetation</i> [10 M]. • Explain different <i>grades of thinning</i>. Discuss in brief the thinning practices adopted for teak plantations [15 M].

<p>2018</p>	<ul style="list-style-type: none"> Justify that the study of <i>Silvics</i> is essential for the successful afforestation program in India [8 M]. Explain different <i>kinds of thinning</i> and its application in the forest [8 M] Explain the <i>Eco-physiological factors</i> that are more concerned to the silviculturist [15 M] Can 'climate change' changed the period of <i>phenology</i>? share with examples [10 M] Write in detail about the <i>influence of parent rock</i> in the <i>distribution of tree species</i> [8 M]. Write the problem and prospects of <i>exotic tree species</i> in India with suitable examples [15] Enlist different <i>types of nurseries</i> and write different types of nursery beds used in a nursery [7.5 M] Enlist different <i>types of containers</i> used in a forest nursery and explain different methods of seed sowing followed in a nursery [7.5 M] What is succession and <i>climax</i>? Give the causes of forest succession [10 M] Write the soil-water relationship of any forest area. Describe the influence of water table in the growth and development of tree species [10 M] What is <i>hydrology</i>? Describe the role of hydrology in the planning and management of watershed development. Do tree species improve the infiltration rate, soil temperature, water level, and hydrological cycle? Justify with few examples [10 M] Write in brief on the criteria of selection of tree for resistance to adverse environments for high-quality timber production [<i>Linked Q</i> : 8 M]
<p>2017</p>	<ul style="list-style-type: none"> Give four examples of uses of <i>Pollarding</i> in Indian forestry [8 M]. Enlist four groups of <i>forest types</i> under the moist tropical forest as per the Champion and Seth classification of forest types [8 M]. Name the <i>method of thinning</i> that best promotes genetic improvement of the regular stand besides controlling density. Give reasons in support of your answer [8 M]. Calculate the number of <i>seeds required</i> to raise a 20-hectare plantation with 4 m x 4 m spacing and an extra plant in the centre of each square. Plant percent of the species is 75% [8 M]. Enlist the advantages and disadvantages of <i>vegetative propagation</i>. What future do you foresee for it in forestry? [10 M]. Some rural communities are opposed to Chir-pine and advocate removal of Chir-pine and its replacement with broadleaved multipurpose trees. What is your reaction to this matter? [10]. Regulation of <i>solar radiation</i> given a powerful tool to the forester justify [10 M]. What is <i>Sub-Climax</i>? Explain its importance in the context of Indian forestry [10 M]. Discuss in detail the kind of <i>Mycorrhiza</i> and the benefits derived by plant from them [8 M] Why <i>Site-Specific Planning</i> is essential for forest management? Explain different Components of site-specific management [8 M]. Describe the <i>effect of thinning</i> on volume increment [10 M]. Define succession. Explain different types of succession in detail, citing suitable examples. Discuss various theories of succession [15 M].

	<ul style="list-style-type: none"> • Explain the classification of <i>forest types</i> in India by Champion and Seth. Enlist major forest types and their group [10 M].
2016	<ul style="list-style-type: none"> • Comment on '<i>Forest has moderating influences</i> on soil and air temperature' [8 M]. • Describe the important <i>objectives of thinning</i>. Differentiating crown thinning from ordinary thinning. Write grades of ordinary thinning [8 M]. • Write the importance of soil organic matter in the forest. How is <i>calculation of number of seedlings</i> carried under Line, square, Triangular, and Quincunx methods of planting? [20 M] • Write in detail the term <i>girdling</i> and <i>pruning</i>. Write scientific names of five trees/Shrubs each for the cold desert and mangrove forest [20 m 1/3 Q]. • Discuss the reasons for widespread use of <i>exotics</i> for plantations and specific advantages of exotics over native species [8 M] • Explain the role of forests in environmental conservation [10 M]. • Justify the statement “Forest substantially check soil erosion and control run-off” [8 M]. • How are the forest classified in India? Discuss its significance in forest management [10 M ½ Q]. • Enumerate the classification of tropical dry deciduous forests given by Champion and Seth (1964). Mention two species for each forest type [10 M].
2015	<ul style="list-style-type: none"> • Comment upon the <i>dieback</i> (dying back) phenomenon in <i>Shorea robusta</i>. Is it a problem or a adaptation? [8 M]. • Describe the methods of pre-sowing treatment of seeds for raising Nursery [10 M] • How can a forest with <i>shade bearer</i> and <i>light demander tree species</i> be managed under <i>uniform shelterwood system</i>? [10 M 1/3 Q] • Explain the term <i>Hardening off</i>. What are the internal factors affecting forest resistance? [10 M]. • Explain How the <i>Latitude influences the forest types</i> of the earth [10 M]. • Explain the necessity of <i>grading of seedlings</i> before plantation [10 M].
2014	<ul style="list-style-type: none"> • <i>Mixed forest stand</i> offers complete utilization of land, Comment [8 M]. • Discuss in detail the evolution of the concept of plant succession [20 m]. • Explain the following – (a) Orthodox and recalcitrant seeds [5 M]. (b) <i>Elite thinning</i> are often difficult to execute [5 M]. • What do you mean by <i>plantation schedule</i>? give in detail the factors which decide the success of plantation program [10 M] • Explain the importance of soil and air temperature on the growth of forest trees [10 M] • Explain the survival strategies of the following group of plants [20 M] - (a) Halophytes, (b) Phraetophytes (c) Xerophytes (d) Succulent. • Discuss the <i>natural regeneration</i> in soil, give steps recommended for ensuring its successful regeneration [8 M].

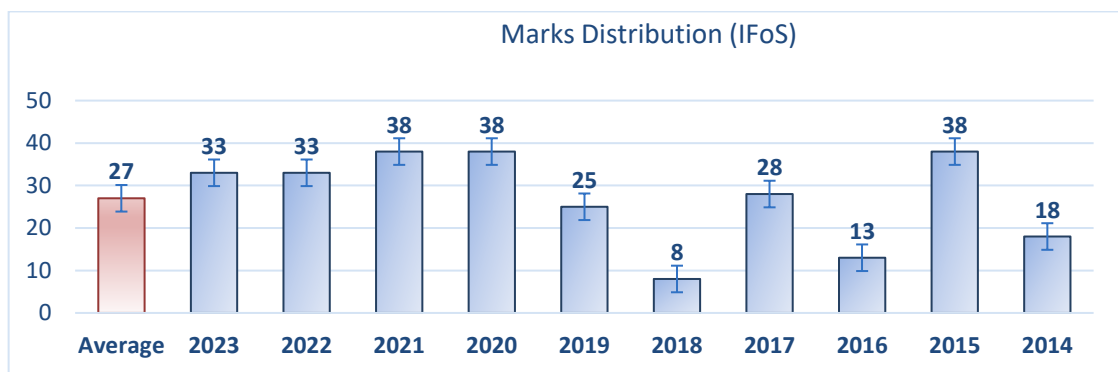
	<ul style="list-style-type: none"> • Why does height of a tree consider a better criterion for a <i>site selection</i> than its diameter? Discuss [5 M] • How is <i>site quality</i> important in timber production? Discuss the methods used to measure the site quality [15 M]. • Explain the <i>importance of snow</i> in regeneration of <i>Cedrus deodara</i> [5 M]. • Difference b/w - (1) <i>Ectomycorrhizae</i> and <i>Endomycorrhizae</i> [4 M]. (2) Exogenous <i>dormancy</i>, and endogenous <i>dormancy</i> [4 M]. • Discuss in detail the objective of <i>artificial regeneration</i> [10 M]. • Describe the characteristics and structure of an <i>even-aged stand</i> [10 M]. • <i>Exotics</i> have potential, do you agree or disagree. Justify your response [5 M]. • What is <i>stand density</i>? How spacing is used to control stand density? Discuss [15 M].
2013	<ul style="list-style-type: none"> • Enumerate the factors which decide the <i>choice of species</i> for plantation [8 M]. • Configuration of the land surface has an impact on local climatic conditions and wind movement, which in turn have a bearing on forest." Comment [8 M]. • Explain the evolution of the <i>concept of plant succession</i> [8 M]. • Explain the role of <i>thinning</i> in forestry. What are the different methods of thinning followed in regular crops? Discuss in detail crown thinning [20 M]. • Explain various factors affecting the choice between <i>natural regeneration</i> and <i>artificial regeneration</i> with reasoning [10 M]. • Based on objectives, what are the different classifications of the <i>forestry</i> ? [10 M]. • Large-scale mortality has been noticed in <i>Dalbergia sissoo</i> and <i>Acacia nilotica</i> What could be the possible reasons for this mortality? (10) • Discuss the <i>mechanism of drought resistance</i>, drought tolerance, and drought avoidance in plants [10 M].
2013	<ul style="list-style-type: none"> • Describe flora and distribution of group: Type 14/C₂ East Himalayan sub-alpine birch fir forests [10 M]. • Write a note on '<i>role of micro-organism and rhizobium</i> in amelioration of forest soils [10 M]. • Describe the operational use of <i>vegetative propagation</i> in tree improvement [10 M].
2012	<ul style="list-style-type: none"> • Comment critically on the following – <ol style="list-style-type: none"> (a) Failure of forest plantations (5 m). (b) Recycling of nutrients in Natural Forest (5) (c) Basis of <i>forest classification</i> and why there is a need for such classification (5). (d) How <i>snow</i> affects the forest vegetation? (5m) (e) Importance of <i>plant succession</i> in Forestry practices (5 m). (f) Reasons of <i>dying Dalbergia sissoo</i> (5m). • Briefly discuss the - <i>Canopy architecture</i> in forestry (4m). • Differentiate between – (1) Growth and development of trees, (2) <i>Ectomycorrhizae</i> and

	<p>Endomycorrhizae (5 × 2 = 10 m).</p> <ul style="list-style-type: none"> • What are the ecological aspects for Selecting the tree species? Discuss [8 M]. • <i>Gregarious flowering</i> is an indicator of drought in the area.' Do you agree with this statement ? (4 m). • Differentiate clearly between natural and artificial regeneration of forest, describe the manner in which natural regeneration of Teak, Sal and Deodars takes places (16 m). • Discuss the <i>role of forest</i> in interception, surface runoff, Infiltration of rainfall, regulation of stem flow, and maintaining Soil fertility (5m). • Do forests influence the rainfall ? If so, how? (5 m). • Discuss in detail the protective role of national forests in India (10 m). • Comments upon - <i>Exotics</i> in Indian Forestry (5m). • Highlight the salient features of – (1) <i>Aerial seeding</i> (2) <i>Stump planting</i> (2x3=6). • Describe flora and distribution of Group : 16 C₁ of Champion & Seth's Forest Type [8 M]. • Describe the altitudinal variations in flora of Eastern and Western Himalayas through a schematic diagram [10 M]. • What are the major ecological consideration in Afforestation (5 m). • List the pioneers flora of sand dunes under – (i) on dunes, (ii) Spread out sand, and (iii) Stabilized dunes (5m)
<p>2011</p>	<ul style="list-style-type: none"> • Why are <i>locality factors</i> considered important for any silvicultural operation? (10 m). • Explain the <i>role of fire</i> in the silviculture of <i>Shorea robusta</i> [10 M]. • How do we calculate the seed requirement of a species while raising nursery? Also explain the method of calculating the number of plants required per hectare for plantation (10m). • Explain the following points in relation to <i>nursery management</i> – (1) Site selection and layout, (2) Soil working, (3) Methods of raising nursery stock, (4) Plant protection measures, (5) <i>Nursery register</i>. (4 × 5 = 20 m) • Differentiate between (5 × 2 = 10 m). <ul style="list-style-type: none"> (a) <i>Exogenous dormancy</i> and <i>endogenous dormancy</i> (b) <i>Artificial regeneration</i> and <i>Natural regeneration</i> • Differentiate between <i>ectomycorrhizae</i> and <i>endomycorrhizae</i> with respect to structure and function [10 M]. • Give <i>legal definition of forests</i> in India. Write about the major groups of forest types of India [10 M]. • Describe the initial causes of secondary succession. Write various seral stages of succession leading to the development of <i>Shorea robusta</i> forests [10 M]. • Describe the tangible and intangible <i>benefits of forests</i> [10 M]. • <i>Linked</i> : Define a <i>forest type</i>. Discuss the different forest types found along with tidal swamp forests with their species composition. Give a note on how <i>Rhizophora racemosa</i> is managed in the mangrove forest of Sundarbans (3 + 12 + 5 = 20 m).
<p>2010</p>	<ul style="list-style-type: none"> • Why do forest plantations fail? cite relevant examples (5 m).

- What are the different types of containers used in raising forest nurseries? List their advantages and disadvantages (5 m).
- Explain the role of growth regulators in rooting of cuttings (5 m).
- Briefly discuss low-temperature injuries in forest trees (5 m).
- What do you understand by the term locality factors? How these affect the decision of plantations undertaken by the silviculturist? [10 M].
- Why is LAI important in deciding the productivity of forest trees? Explain the concept of optimum LAI and how it varies with the type of forest and climate [10 M].
- Differentiate between the – (i) Site quality and site index, (ii) Gregarious flowering and sporadic flowering in bamboo ($4 \times 2 = 8$).
- Comment on following – (a) Pure stand of forest result incomplete utilization of the site, (b) Plantation forestry has high production potential but low conservation value ($5 \times 2 = 10$ m).
- Distinguish between "Tending operations" and "Cultural operations" in forestry [10 M].
- Write short notes on – (a) Canopy architecture, (b) Radiation absorption and energy balance in forest, (c) **Seed coating** and pelleting, (d) Nutrient cycling in natural forest ($5 \times 4 = 20$ m).
- Write on tree species for smoke and dust pollution control (5 m).
- What morphological, Anatomical, and physiological features are suited in Xerophytic plants [10 M].

MANGROVES & COLD DESERT

Mangrove : Habitat and characteristics of mangrove, plantation-establishment, and rehabilitation of degraded mangrove formations; silvicultural systems for mangrove; protection of habitats against natural disasters. **Cold Desert** - Characteristics, identification and management of species.



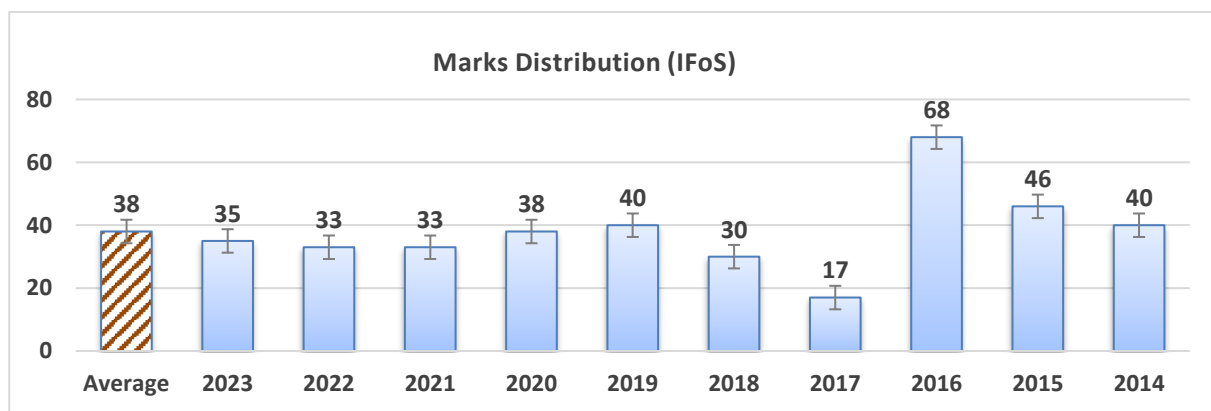
2023	<ul style="list-style-type: none"> • What are mangroves? Write their ecological implications [8 M] • What are the sequences of operations followed in mangrove afforestation? Discuss in detail the <i>fishbone technique</i> of mangrove plantation [10 M]. • What is a cold desert ? Describe the distribution pattern of cold desert species in India. How are cold desert areas afforested? [15 M].
2022	<ul style="list-style-type: none"> • What are the <i>major threats</i> to mangrove forests? (8 m) • Describe the <i>characteristics of cold desert</i>. How does choice of species play an important role in cold desert afforestation programme? How are cold desert areas afforested? (15 m) • Is coastal <i>rehabilitation using mangrove species</i> a success? Explain the plantation technique for degraded mangrove forest (10 m)
2021	<ul style="list-style-type: none"> • Why is it difficult to carryout <i>afforestation programmes</i> in cold deserts ? (8m). • What is the <i>ecological significance of cold deserts</i>? How do plants adapt and survive under cold and harsh desert conditions? Provide a list of common native species of a cold desert (15m). • What are the <i>characteristics and significance of mangrove forests</i> ? Discuss important species formation in mangrove forests (15 m).

2020	<ul style="list-style-type: none"> Describe the <i>reforestation techniques of mangrove forests</i>. Explain the following mangrove habitats : (i) Deltaic mangrove habitat, (ii) Coastal mangrove habitat (15 m). Describe the various causes of <i>degradation of mangrove forests</i>. Discuss the factors responsible for mangrove species regeneration and growth. Write the scientific names of five woody shrubs/tree species of cold desert (15m). Write the adaptive <i>characteristics of plant species of cold desert</i> (8 m).
2019	<ul style="list-style-type: none"> What are the <i>major causes of degradation of mangrove forest</i>? Discuss in brief the methods of rehabilitation of degraded mangroves (15 m). What are the <i>characteristic features of cold deserts</i> of the Himalayas? Write the scientific names of <i>any 5 tree species</i> of cold desert (10 m).
2018	<ul style="list-style-type: none"> Define the <i>characteristics of mangrove forest</i> (8m).
2017	<ul style="list-style-type: none"> Describe the unique <i>characteristics of mangrove forest</i> vegetation (10 m). Enlist <i>6 genera of mangroves</i>. Name 2 state and 1 UT with the large area under mangrove forest (8m). <i>Where are cold desert</i> found in India ? explain <i>site characteristics</i> of cold desert and stem suggested to overcome problems in their afforestation (10 m).
2016	<ul style="list-style-type: none"> Write the <i>scientific name of 5 trees / shrubs</i> each for the cold desert and mangrove forest (5- 5m) Write the <i>characteristics of cold desert</i>. Discuss soil working and planting techniques for cold desert (8m).
2015	<ul style="list-style-type: none"> Discuss the <i>sustainable management of mangrove forest</i> in India (8 m). How is the accrual of <i>tangible and intangible benefits of mangroves forest</i> being affected by their degradation? (10 m) Give the scientific name of – (a) 5 species of mangrove forest, (b) Five tree/Shrub species of the cold desert (10 m). Comment upon the adaptation and <i>survival strategies of the plant species</i> endemic to the cold desert area of the western Himalaya (10 m).
2014	<ul style="list-style-type: none"> Discuss the <i>characteristics of mangrove forest</i> with examples (8m). Describe the following – (a), (b) <i>fish bone technique</i> (2.5m) Discuss the <i>importance of willow cultivation</i> in cold desert (8m).
2013	<ul style="list-style-type: none"> Explain the following mangrove habitat (8 m). <ul style="list-style-type: none"> (a) Deltaic mangrove habitat (b) Coastal mangrove habit (both east & west) What are the specific <i>problems of the wetland</i>? Suggest at least 3 species for planting in each of them [Linked Q]. Write about the species diversity and centre of origin of Willows (Salix species). Describe its various uses under short rotation forestry (8 m). <i>Willow is the life line in dry temperate region</i> (Lahul-Spiti) but its large-scale drying is causing great concern. Give your viewpoints (8 m).

2012	<ul style="list-style-type: none"> • How are the mangrove forest managed in India? (5 m).
2011	<ul style="list-style-type: none"> • Suggest measures to <i>rehabilitate degraded mangroves forest</i> (10 m). • Define a forest types, Discuss the different <i>forest types found along tidal swamp forest</i> with their species composition. Give a note on how <i>rhizophora racemosa</i> in mangroves is managed in mangrove forest of Sundarbans.
2010	<ul style="list-style-type: none"> • Comment on - Mangrove ecosystems have physiologically dry soil (5m) • Give the zonation of land-sea interface in a typical mangrove eco-system with its characteristics • How and why should cold desert forest ecosystem be conserved? (10 m)
2009	<ul style="list-style-type: none"> • Describe the <i>characteristics of Mangrove Forest</i>. Explain the silvicultural system followed to manage the mangrove forest. • Write short notes on - Cold desert (5 m).
2008	<ul style="list-style-type: none"> • Discuss the <i>characteristics of cold desert</i> in India. Suggest any two species suitable for plantation in the cold desert, their importance and system of management (20m).
2007	<ul style="list-style-type: none"> • Discuss the silvicultural system for managing mangrove forests of India
2006	<ul style="list-style-type: none"> • How degraded mangrove formations can be rehabilitated. • Discuss <i>afforestation of cold deserts</i> with suitable tree species

SILVICULTURE SYSTEMS

Silviculture systems : Clear felling, uniform shelter wood selection, coppice and conversion systems, Management of silviculture systems of temperate, subtropical, humid tropical, dry tropical and coastal tropical forests with special reference to plantation silviculture, choice of species, establishment and management of standards, enrichment methods, technical constraints, intensive mechanized methods, aerial seeding, thinning



2023	<ul style="list-style-type: none"> • What are <i>Accessory Systems</i>? Describe the two-storeyed high forest system [10 M]. • Who developed the <i>Andaman Canopy Lifting Shelterwood System</i>? Describe the different operations being followed in the system [15 M]. • What is <i>Clear Felling System</i>? Describe the pattern of felling and methods of obtaining regeneration under clear felling system [10 M].
2022	<ul style="list-style-type: none"> • <i>Improvement felling</i> is not considered as a silvicultural system. Why? (8m) • Differentiate between <i>coppice with standards</i> and <i>coppice with reserves</i>. Explain in detail the coppice with two rotations and pollard system (15 m) • Explain the following – (a) Selection felling, (b) Regeneration felling, (c) Selective felling, (d) Enrichment planting (10 m)
2021	<ul style="list-style-type: none"> • ‘An appropriate silviculture system promotes better regeneration of forest stand’ Comment (8m). • Elucidate the pattern of felling and mode of regeneration adopted under <i>selection system</i> of management (10 m). • What are the conditions on which the <i>choice of a particular silvicultural system</i> to be adopted for specific species in any locality depends? (15 m).

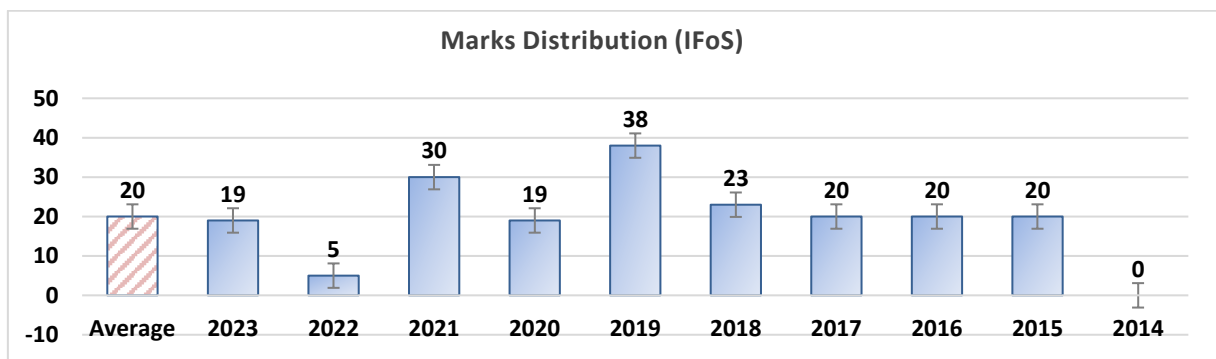
2020	<ul style="list-style-type: none"> Explaining the factors which affect the <i>length of regeneration period</i> in a periodic block (8). Define <i>coppice with standard</i> system. What are the advantages and disadvantages? Differentiate it from <i>coppice with two rotation system</i> (15 m). Enumerate the objectives of <i>management of canal plantations</i>. Explain the silviculture system to manage them (15 m).
2019	<ul style="list-style-type: none"> Write the special characteristics of <i>Indian Irregular Shelterwood System</i> and differentiate it from Uniform System (15 m). “Felling height and felling intensity play a major role in the advantages sustainability of clumps of bamboo species” Comment (10 m). Explain the <i>alternative strip system</i> and the clear strip system. Write the advantages and disadvantages of clear-felling system (15 m).
2018	<ul style="list-style-type: none"> Enlist the <i>classification of silvicultural systems</i> on the basis of mode of regeneration and pattern of felling (15 m). What is conversion? Discuss the need of conversion of one silvicultural system to another (15 m).
2017	<ul style="list-style-type: none"> Enlist the general rules governing the felling of bamboo in forests. What are the consequences of gregarious flowering of bamboo? What special measures would you take in the event of gregarious flowering? (15 m)
2016	<ul style="list-style-type: none"> Define <i>clear felling system</i>. How is Saransa sal (<i>Shorea robusta</i>) forest managed under clear felling followed by natural regeneration? (8) Describe the silvicultural system which may be introduced to manage a plantation forest of <i>Azadirachta indica</i> (20M). Discuss in brief the <i>Simple Coppice System</i>. Write different types of Coppice System (20). Describe kinds and pattern of fellings followed in <i>Shelterwood Uniform System</i>. Explain Uniform System which is followed to manage (<i>Pinus roxburghii</i>) forests of Himachal Pradesh (20 M).
2015	<ul style="list-style-type: none"> Describe the major factors which affect the <i>length of the regeneration period</i> in a Periodic Block (8 m). Comment upon the variations practised in the silvicultural system of <i>Shorea robusta</i> in the States of UP, Bihar, Odisha and West Bengal (8 m). How can a forest with shade bearer and light demander tree species be managed under <i>Uniform Shelterwood System</i>? (10 M). Describe the silvicultural system which is introduced to manage <i>Shorea robusta</i> forest after the failure of Uniform System (10 M). How is <i>Tectona grandis</i> forest managed under <i>clear felling followed by artificial regeneration</i>? (10 m).
2014	<ul style="list-style-type: none"> Discuss the <i>uniform system with artificial regeneration</i> (10 m). Explain the forest conversion process of <i>coppice system to Uniform</i> broad-leaved high forest by natural regeneration (20 m). Discuss <i>two stories high forest</i> and explain its advantages (10 m).
2013	<ul style="list-style-type: none"> Explain the factors which affect the length of regeneration period in a Periodic Block. What is the effect of regeneration period on the form of crop? (8m).

	<ul style="list-style-type: none"> • How is allotment of areas made in Permanent and Floating Periodic Blocks? (10 m). • Describe the method followed to introduce the uniform Shelterwood System in a forest where <i>Cedrus deodara</i> is mixed with <i>Pinus wallichiana</i> (10 m). • Write about the impact of felling height and felling intensity on the sustainability of bamboo's clump (10 m).
2012	<ul style="list-style-type: none"> • Successful regeneration in a forest depends upon silvicultural. System. (5 m) • How will. you classify a silvicultural system? Discuss important features of Uniform system with 'reference to <i>Pinus roxburghii</i> and give its merits and demerits (4+8+4 = 16) • briefly describe the clear-felling silvicultural system with particular reference to – (a) Nature of crop produced, (b) Felling system, (c) Tending, (d) Regeneration, (e) Advantages and disadvantages (10 m).
2011	<ul style="list-style-type: none"> • Define forest conversion. Explain the adverse situations under which conversion is advisable. Write in brief the general techniques of forest conversion (2 + 4 + 4 = 10 m). • Briefly describe the selection system with particular reference to the following - (i) Character of crop produced, (ii) Felling cycle, (iii) Tending, (iv) Regeneration, (v) Advantages and disadvantages (2 × 5 = 10 m).
2010	<ul style="list-style-type: none"> • Briefly discuss a silvicultural system in which equal or equi-productive areas of mature crops are successfully felled (5 m). • Successful regeneration in a forest stand depends upon judicious choice of a silviculture system. Comment (10 m). • Comment upon, Conversion” is an accepted silvicultural system (5 m).

SILVICULTURE OF IMPORTANT INDIAN TREE SPECIES

Silviculture of trees : Traditional and recent advances in tropical silvicultural research and practices.

Silviculture of some of the economically important species in India such as *Acacia catechu*, *Acacia nilotica*, *Acacia auriculiformis*, *Albizia lebbek*, *Albizia procera*, *Anthocephalus Cadamba*, *Anogeissus latifolia*, *Azadirachta indica*, *Bamboo spp.*, *Butea monosperma*, *Cassia siamea*, *Casuarina equisetifolia*, *Cedrus deodara*, *Chukrasia tabularis*, *Dalbergia sissoo*, *Dipterocarpus spp.*, *Embllica officinalis*, *Eucalyptus spp.*, *Gmelina Arborea*, *Hardwickia binata*, *Lagerstroemia Lanceolata*, *Pinus roxburghii*, *Populus spp.*, *Pterocarpus marsupium*, *Prosopis juliflora*, *Santalum album*, *Semecarpus anacardium*, *Shorea robusta*, *Salmalia malabaricum*, *Tectona grandis*, *Terminalis tomentosa*, *Tamarindus indica*.



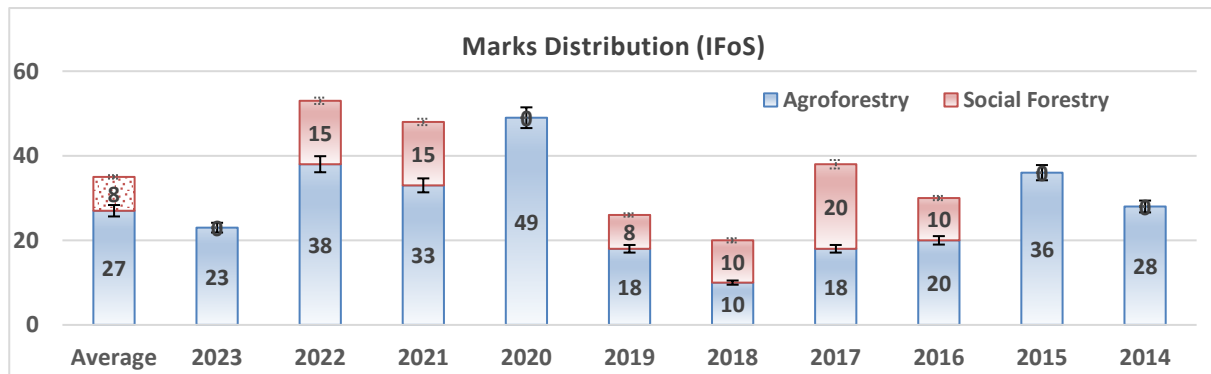
2023	<ul style="list-style-type: none"> The shoot portion of seedlings of some tree species like <i>Sal</i> and <i>Sandal</i>, under natural regeneration, keeps on drying year after year but the roots remain alive. Discuss [Linked Q 8 M] Write the factors which affect the natural regeneration of <i>Sal</i> (<i>Shorea robusta</i>). Discuss the procedure to obtain natural regeneration of moist <i>Sal</i> forests [Linked Q 15 M]. Write the economic importance of the following tree species [15 M]. <ol style="list-style-type: none"> <i>Acacia catechu</i> <i>Casuarina equisetifolia</i> <i>Hardwickia binate</i> <i>Butea monosperma</i> <i>Tamarindus indica</i>
2022	<ul style="list-style-type: none"> Explain the techniques for the upgradation and hardening of nursery seedlings of <i>Lagerstroemia lanceolata</i> [Linked Q 8 M] How are nurseries classified in India? What is a clonal nursery? Explain the nursery technique for <i>Casuarina equisetifolia</i> [Linked Q 15 M]

2021	<ul style="list-style-type: none"> Discuss the phenology, Silvicultural characters and regeneration methods of – (i) <i>Gmelina arborea</i>, (b) <i>Pinus roxburghii</i> [15 M]. Elucidate the distribution, Nursery techniques and economic importance of – (i) <i>Cedrus deodara</i>, (ii) <i>Acacia catechu</i>, (iii) <i>Casuarina equisetifolia</i> [15 M].
2020	<ul style="list-style-type: none"> Describe the methods of artificial regeneration of <i>Tamarindus indica</i> [Linked Q 8 M]. Give a brief account of the silvicultural characters and regeneration methods for the following species - (a) <i>Acacia catechu</i>, (b) <i>Populus deltoides</i> [15 M].
2019	<ul style="list-style-type: none"> Write a brief account of the phenology, silvicultural characters and methods of regeneration of <i>Dalbergia sissoo</i> (8 m). Discuss in details silviculture of <i>Albizia lebbek</i> [15 M].. Give a brief account of origin and natural distribution of the following - (a) <i>Adina cordifolia</i>, (b) <i>Cedrus deodara</i> and (c) <i>Santalum album</i> [15 M].
2018	<ul style="list-style-type: none"> Discuss the physiology of <i>root parasitism</i> in sandal tree (8M). Write the <i>phenology</i> of the following (5M) – (a) <i>Tectona grandis</i>, (b) <i>Melia dubia</i>, (c) <i>Shorea robusta</i>, (d) <i>Cedrus deodara</i>. Give the <i>silvicultural characteristics</i> and <i>economic importance</i> of the following (10) <ul style="list-style-type: none"> (a) <i>Azadirachta indica</i> (b) <i>Acacia catechu</i>
2017	<ul style="list-style-type: none"> Describe the natural distribution of - <i>Shorea robusta</i>, and <i>Azadirachta indica</i>. (10 M). Write silvicultural characters of <i>Casuarina equisetifolia</i> and <i>Abies pindrow</i> (10 M).
2016	<ul style="list-style-type: none"> Describe in brief the distribution, phenology, silvicultural characteristics, artificial regeneration and uses of the following species - (a) <i>Tectona grandis</i> (2) <i>Santalum albus</i> [20m].
2015	<ul style="list-style-type: none"> Briefly Describe the silviculture characters and natural regeneration of the following – (a) <i>Dendrocalamus hamiltonii</i>, (b) <i>Acacia auriculiformis</i>, (c) <i>Dalbergia sissoo</i> [10 M]. Describe in brief the phenology, silvicultural characteristics and artificial regeneration of the following tree species – (a) <i>Pinus roxburghii</i>, (b) <i>Cedrus deodara</i>, (c) <i>Albizia lebbek</i> [10 M].
2012	<ul style="list-style-type: none"> Give <i>distribution, phenology, method of regeneration</i> and brief silvicultural management of two tree species belonging to each family below - (a) <i>Meliaceae</i> (b) <i>Papilionaceae</i>, grown in India [4 x 4 = 16 M]. Discuss in brief the <i>silviculture</i> of the following species - (a) <i>Shorea robusta</i> (b) <i>Bamboo species</i> [2 x 4 = 8 M].
2011	<ul style="list-style-type: none"> Describe the silvics of <i>Tectona grandis</i> under the following heads [5 x 4 = 20 m]. (a) Distribution and morphology, (b) Silvicultural characters, (c) Silvicultural system and management, (d) Utilization. Describe the silvics of <i>Casuarina equisetifolia</i> under the following heads [5x4 = 20]. (a) Ecology and distribution, (b) Propagation and management, (c) Functional uses, (d) Pests and disease.

2010	<ul style="list-style-type: none"> • “Indian Sandalwood (<i>Santalum album</i>) is the most valuable wood in India. However, silvicultural production of this species is not satisfactory.” Discuss the above in relation to the phenology of <i>Santalum album</i> and the forest laws governing its cultivation and trade • Give climatic requirement, rotation age, spacing, tending operations and yield of the following forest species – (a) <i>Populus deltoides</i>, (b) <i>Casuarina equisetifolia</i>.
2009	<ul style="list-style-type: none"> • Write the phenology, regeneration and silviculture characteristics of any four of the following species (a) <i>Azadirachta indica</i>, (b) <i>Pinus roxburghii</i>, (c) <i>Tectona grandis</i>, (d) <i>Gmelina arboria</i>, (e) <i>Dendrocalamus hamiltonii</i> (4 x 10 = 40m).
2008	<ul style="list-style-type: none"> • Narrate the silviculture practices followed in any four of the following – (a) <i>Santalum album</i>, (b) <i>Acacia catechu</i>, (c) <i>Shorea robusta</i>, (d) <i>Dalbergia latifolia</i>. (40 m). • What is controlled burning? Discuss the advantages and disadvantages of burning in pine forests (10 m) [<i>Linked Q</i>].

AGROFORESTRY & SOCIAL FORESTRY

Agroforestry – Scope and necessity; role in the life of people and domestic animals and in integrated land use, planning especially related to (i) soil and water conservation; (ii) water recharge; (iii) nutrient availability to crops; (iv) nature and eco-system preservation including ecological balances through pest-predator relationships and (v) Providing opportunities for enhancing biodiversity, medicinal and other flora and fauna. Agroforestry systems under different agro-ecological zones; selection of species and role of multipurpose trees and NTFPs, techniques, food, fodder and fuel security. Research and Extension needs. **Social / Urban Forestry** - Objectives, scope and necessity; People's participation.



AGROFORESTRY

2023	<ul style="list-style-type: none"> Explain the role of windbreaks and shelterbelts in Agroforestry. Name two tree species for each [8 M]. Discuss the role of Agroforestry in the well-being of mankind [15M].
2022	<ul style="list-style-type: none"> What are the differences between traditional agroforestry and ethno-agroforestry? Explain in brief, below-ground and above-ground, tree-crop interactions in agroforestry systems (20 m) What are the constraints in the value chain under industrial agroforestry? (10 m) How does agroforestry help to achieve the United Nations' Sustainable Development Goals? (8 m)
2021	<ul style="list-style-type: none"> How do agroforestry wood perennials protect the understorey crops? (8m) How does agroforestry promote the sustainable livelihood of marginal farmers? (10 m) How does crop rotation and mixed farming improve soil productivity? (15 m)

2020	<ul style="list-style-type: none"> • “Agroforestry system conserves soil and moisture” Justify the statement (8m). • Write the <i>tangible and intangible benefits</i> of agroforestry (8m). • “<i>Taungya cultivation</i> is a type of traditional agroforestry system” Justify the statement (15 m). • Write the scientific names of any five multipurpose tree species suitable for agroforestry system in (i) Arid and semi-arid and (ii) Sub-tropical Hills of India (10 m). • How does shifting cultivation support community livelihood and biodiversity conservation? (8m).
2019	<ul style="list-style-type: none"> • Agroforestry is a better land-use system for <i>climate change mitigation</i> and adaptability. Justify (8 m). • What are MPTs ? explain their role in social forestry (10 m).
2018	<ul style="list-style-type: none"> • Write about the <i>diagnostic and design</i> survey of agroforestry. Can it help the farmers in the integration of tree with crops to enhance the crop productivity in agroforestry system? Justify (10 m).
2017	<ul style="list-style-type: none"> • Discuss the impact of <i>agroforestry</i> practices on the environment in general and on soil properties in particular, with a suitable example (8 m). • Differentiate between <i>Windbreaks</i> and <i>Shelterbelts</i>. Discuss in brief, their impact on the environment (10m).
2016	<ul style="list-style-type: none"> • Discuss the role of <i>agroforestry</i> in nutrient cycling and soil conservation. How is saline soil reclaimed? (20 m)
2015	<ul style="list-style-type: none"> • Discuss the needs and <i>scope</i> of <i>agro-forestry</i> for the benefits of people (8 m) • Elaborate upon the <i>social objectives</i> of agroforestry (8m). • The adoption of agroforestry practices by the farming community is the result of increasing human and cattle populations. Discuss (10 m). • Outline the role of <i>tree architecture</i> in agroforestry (10 m).
2014	<ul style="list-style-type: none"> • Describe the <i>benefits</i> and <i>constraints</i> of <i>agroforestry</i> (8 m). • Why are agroforestry systems becoming popular in Himalayan <i>Tarai regions</i>, Western plains and Southern parts of India? Discuss your answer with reasons and tree-crop combinations adopted in these regions and parts of the country (20 m).
2013	<ul style="list-style-type: none"> • What are the unique <i>requirements for tree improvement</i> in agroforestry? (8m). • Describe tree-crop <i>allelopathy</i> in agroforestry (8m). • What are the fundamental bases of <i>classification</i> of agroforestry systems? (10 m).

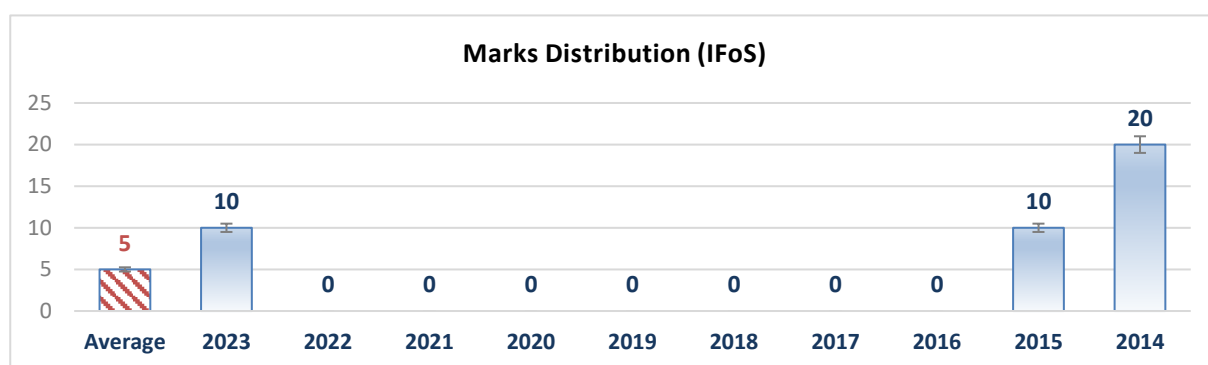
2012	<ul style="list-style-type: none"> How <i>shelterbelt</i> and <i>windbreaks</i> are helpful in sand dune stabilization and desert control ? (5m). What do you know about <i>recent progress in Agroforestry</i> research and development in our country for sustainable development? (5m). what is <i>D & D</i> ? Who can make use of <i>D & D</i> and How? (10 m).
2011	<ul style="list-style-type: none"> While <i>selecting the species</i> for agroforestry, the below-ground and above ground interaction between the component species need to be considered. Discuss (10 m). Write short notes on – (i) <i>Aquaforestry</i>,..... (iv) <i>Home gardens</i> ($2 \frac{1}{2} \times 2 = 5$ m). Explain the various components of a <i>hydrological model</i> for an agroforestry system (10m). Compare <i>nutrient cycling</i> in a natural forest, an agroforestry system and an agriculture field. Discuss how it helps to sustain soil fertility (10 m).
2010	<ul style="list-style-type: none"> Comment on - The needs of research in Agroforestry in India. Explain diagnosis and design in Agroforestry.
2009	<ul style="list-style-type: none"> Describe the traditional Agroforestry system practised in North-East India (10m). Write the Scientific name of 10 Multipurpose tree species (MPTs) commonly planted in social forestry (10 m). Define Agroforestry. Describe an agroforestry model suitable to rehabilitate degraded hills. Discuss the gains of Agroforestry system ($2+10+8 = 20$). Write short-notes on – Agro-ecological zone (5m).
2008	<ul style="list-style-type: none"> Differentiate between Windbreaks and shelterbelts. Give design and layout of windbreaks and shelterbelts. Suggest suitable tree species with their characters (20m).

SOCIAL FORESTRY

2022	<ul style="list-style-type: none"> Discuss the key problems to expand tree cover in urban areas. Explain the role of urban trees in abating soil pollutants (15 m).
2021	<ul style="list-style-type: none"> Discuss the problem of commons in social forestry. Suggest some effective strategies to overcome these problems (15 m).
2019	<ul style="list-style-type: none"> Briefly describe the <i>Aim, objectives and scope</i> of urban forestry in India (8 m).
2018	<ul style="list-style-type: none"> What is <i>farm forestry</i>? Write about the objectives, difficulties and financial return from the farm forestry (10 m).
2017	<ul style="list-style-type: none"> Explain the scope and aims of <i>Urban forestry</i>. Discuss the need of urban forestry in the

	improvement of city environment (20 m).
2016	<ul style="list-style-type: none"> Briefly discuss aims, objectives and scope of <i>social forestry</i>. Why is people's participation must in social forestry? (10m).
2012	<ul style="list-style-type: none"> How <i>social forestry</i> differs from other types of forestry? (5m).
2011	<ul style="list-style-type: none"> Management <i>challenges in the urban forestry</i> are unique as compared to other social forestry programs. Discuss (10m).
2010	<ul style="list-style-type: none"> <i>Drawback of social forestry programs</i> in India. Short notes on – management of urban forestry.
2009	<ul style="list-style-type: none"> Discuss various approaches required to motivate the members of a tribal community to introduce social forestry plantation in their farmland (10 m)
2008	<ul style="list-style-type: none"> What is extension forestry ? List constraints in obtaining people participation in social forestry (10).

Tribal scene in India; tribes, the concept of races, Principles of social grouping, stages of tribal economy, education, cultural tradition, customs, ethos and participation in forestry programs.



2023	<ul style="list-style-type: none"> Enlist the problems faced by the tribal communities in India [10 M]
2015	<ul style="list-style-type: none"> Enumerate and discuss the <u>factors responsible for restricting tribal population</u> in the national parks (10 m).
2014	<ul style="list-style-type: none"> <u>Name</u> different tribes of India <u>state-wise</u> and their specific <u>characteristics</u>. How can we make use of their <u>traditional knowledge</u> in forest conservation (flora and fauna) ? (20 m).
2013	<ul style="list-style-type: none"> Give the fundamental <u>characteristics of the tribal economy</u> in India (8 m).
2011	<ul style="list-style-type: none"> Write short notes on (i) Tribal economy, (ii) Chola Naickans, (iii) Gujjars, (iv) Gonds (10 m). Discuss the characteristics which are shared by the diverse tribal groups all over India (10 m).
2010	<ul style="list-style-type: none"> How can we make use of the <u>traditional knowledge</u> of the major tribes of India in forest conservation (both flora and fauna) ? [Linked Q]
2009	<ul style="list-style-type: none"> Discuss various approaches required to motivate the members of a <u>tribal community</u> to introduce <u>social forestry plantation</u> in their farmland. [Linked Q]
2007	<ul style="list-style-type: none"> Describe the <u>ethnic communities</u> of India. Give their contribution to ethnobotany
2006	<ul style="list-style-type: none"> Forest are key to the <u>tribal economy</u>, Justify

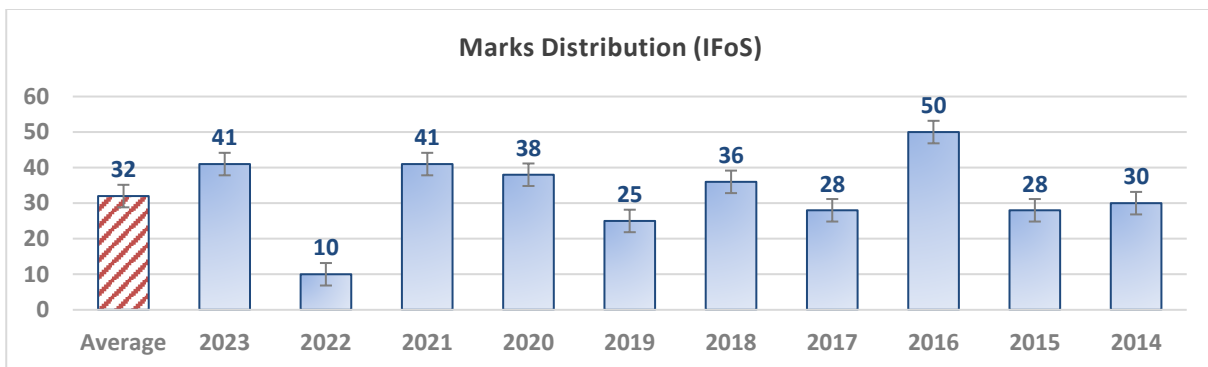
JOINT FOREST MANAGEMENT (JFM)

Details of steps involved such as the formation of Village Forest Committees, Joint Forest Participatory Management. Principles, objectives, methodology, scope, benefits and role of NGOs.

2023	<ul style="list-style-type: none"> Write a note on the gender issues in Joint Forest Management (JFM) [8 M]. What is village forest committee? Explain its role in forest management [10 M].
2022	<ul style="list-style-type: none"> "Participatory Forest Management is a success". Illustrate with examples (10 m)
2021	<ul style="list-style-type: none"> How do the <i>ownership rights</i> of forests <i>influence the success</i> of joint forest management? (8 m).
2020	<ul style="list-style-type: none"> How does collaborative forest management ensure community and household resilience? (8m) [Linked Q]
2019	<ul style="list-style-type: none"> Why are <i>participatory rural appraisal</i> (PRA) techniques important for planning and execution of Joint Forest management (JFM) Activities? Explain the <i>tools and techniques of PRA</i> (15 m).
2018	<ul style="list-style-type: none"> What are the <i>Objectives</i> of Joint Forest Management (JFM)? Give <i>Methods</i> used for preserving forest resources through JFM (15 m).
2017	<ul style="list-style-type: none"> Write in detail as to why the Joint Forest Management Policy was initiated and what are its <i>Constraints</i> in implementation? (15 m).
2016	<ul style="list-style-type: none"> Trace the <i>History of JFM</i> in India, narrate any one success story with details (15 m).
2014	<ul style="list-style-type: none"> Introduction of JFM in various states in India was found <i>Positive in biodiversity conservation</i>, discuss in details (8m).
2013	<ul style="list-style-type: none"> Describe constitution of <i>JFM Network</i> by MOEF, GOI with its terms of reference (7m). What entry point activities are recommended in joint forest management? (8m)
2012	<ul style="list-style-type: none"> What shifts in attitude among Forest Personnel from the present are required for better success of Joint Forest Management? Discuss (10 m).
2010	<ul style="list-style-type: none"> How can we make use of the traditional knowledge of the major tribes of India in forest conservation (both flora and fauna) ?
2009	<ul style="list-style-type: none"> Write general <i>principles of benefit sharing</i> under Joint Forest Management
2008	<ul style="list-style-type: none"> How are the village forest committees constituted for conservation of forest resources under Joint Forest Management? (10 m)

ENVIRONMENTAL CONSERVATION & BIODIVERSITY

Environment - components and importance, principles of conservation, impact of deforestation; forest fires and various human activities like mining, construction and developmental projects, population growth on environment. **Pollution** - types, global warming, greenhouse effects, ozone layer depletion, acid rain, impact and control measures, environmental monitoring; concept of sustainable development. Role of trees and forests in environmental conservation; control and prevention of air, water and noise pollution. Environmental policy and legislation in India. Environmental Impact Assessment. Economics assessment of watershed development *vis-a-vis* ecological and environmental protection.



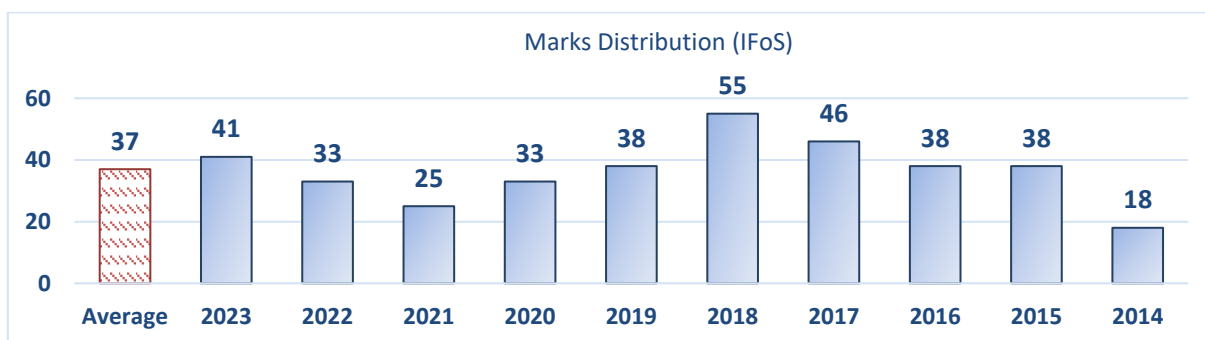
2023	<ul style="list-style-type: none"> Greenhouse gases result in global warming. Discuss [8 M] What is Environmental Impact Assessment (EIA)? Describe the activities involved and general procedure in EIA [15 M] Write on carbon sequestration and discuss the role of afforestation in absorptions of carbon dioxide (CO₂) from atmosphere [10 M] Write the components of vehicular air pollution and list the damages caused to roadside trees [8]
2022	<ul style="list-style-type: none"> How do tree and shrub mass influence the mitigation of particulate matter and noise in urban settings? [10 M]
2021	<ul style="list-style-type: none"> What is the <i>relationship between air pollutants and climate change</i>? How does forest vegetation abate different types of pollutants? Describe Air (Prevention and Control of Pollution) Act, 1981 in relation to pollution management. Suggest name of suitable plant species (15m). Explain the <i>role of trees and forests in Environmental conservation</i> (15m) [Linked Q – Silviculture] What are the <i>impacts of COVID-19 pandemic on environment and biodiversity</i> (8m) What id REDD+? How does clean development mechanism help in sustainable management of forests? (8m) What is the role of forest plantations in <i>Carbon Sequestration</i>? (10 m)

2020	<ul style="list-style-type: none"> Describe the <i>In-Situ Biodiversity Conservation</i> with reference to biosphere reserves (8m). What do you mean by population diversity? What are the different methods to measure biodiversity? (15m). Explain the methods of <i>Environmental Impact Assessment</i> (15m).
2019	<ul style="list-style-type: none"> List out the <i>greenhouse gases</i> that contribute to <i>global warming</i>. What are the effects of global warming? Explain the role of trees and forests in combating environmental degradation (15 m). Explain the concept of <i>sustainable development</i>. Discuss in brief the agenda for sustainable development (10 m).
2018	<ul style="list-style-type: none"> Write the salient features of the <i>solid waste management act, 2000 and 2016</i>. What new initiatives have been taken in the <i>solid waste management rules, 2016</i>? (8m). Write about the <i>pre- and post-Environmental Impact Assessment (EIA)</i> of any mining area of India. Does GIS help in EIA? Write the name of the software used in Environmental Impact Assessment for the mining areas (10 m) What is <i>sustainable development</i>? Write about the criteria and indicator of sustainability fulfilling the needs and demands of growing population of India (10 m). What is the <i>ecological and economical importance of biodiversity</i> ? Mention the salient measures for <i>conservation of biodiversity</i> (8 m).
2017	<ul style="list-style-type: none"> Comment on the possible <i>impact of greenhouse gases</i> on the global environment (8 m). Discuss the term <i>Biodiversity</i>. Explain the levels in which it can be studied. What are the different measures employed to measure biological diversity? Elaborate (20 m).
2016	<ul style="list-style-type: none"> Define <i>global warming</i>. Explain in brief the principle behind greenhouse effect. Write the consequences of global warming on forest, wildlife and the human health (20 m). What are the <i>objectives of carrying out EIA</i>. Discuss sequentially, the different phases of an EIA study (10 m). Explain the <i>Role of forest in environmental conservation</i> (10 m). How are “Environment”, Environmental pollutant” and “Hazarous substance” narrated in environment (protection) act, 1986? (10 m).
2015	<ul style="list-style-type: none"> What is the penalty prescribed in section 15 of the environmental (Protection) act, 1986 for contravention of the provisions of the environmental act, rules and orders? (8 m). Write the <i>chemistry of ozonosphere</i> and list the adverse effects of ozone layer depletion (10 m). What is <i>arsenic pollution</i>? Discuss the strategies to mitigate it (10 m).
2014	<ul style="list-style-type: none"> What do you understand by the term <i>greenhouse gases</i> ? Explain how these gases disturb the ecological balance of nature and suggest suitable remedies (10m). Why is a balance between production, social and environmental objectives necessary in sustainable forest management plans? (20 m).
2013	<ul style="list-style-type: none"> What is <i>Global Warming</i>? Discuss how it disturbs the ecological balance of nature, and suggest suitable remedies (20 m). Explain the following – (i) Criteria pollutant, (ii) Pollutant standard index, (iii) Severance tax, (iv) Smog (2 ½ × 4 = 10 m).

	<ul style="list-style-type: none"> Briefly describing the <i>National Legislation on Biodiversity</i>. Name the activities for which states can seek fund from the central government (10 m).
2012	<ul style="list-style-type: none"> What are major ecological considerations in afforestation's? (5m)
2011	<ul style="list-style-type: none"> Name the <i>Biodiversity Hot Spots</i> in India. Discuss the major threats to biodiversity (10 m). Write short notes on – (i) Carbon sequestration, (ii) Riparian buffers, (iii) Forest decline, and (iv) Nitrate pollution ($2\frac{1}{2} \times 4 = 10$ m). What are the effects of particulate <i>air pollutants</i> on the regeneration of a forest ecosystem? Discuss (10 m).
2010	<ul style="list-style-type: none"> Discuss the following - <i>Rio conference</i> (5 m). What do you understand by the term '<i>hot spot</i>' in relation to floral biodiversity? Explain methods of <i>ex-situ and in-situ conservation</i>. How is <i>Forest Certification</i> done in developed countries? Comment on its present status in India. Write on tree species for smoke and dust pollution control (5 m)
2009	<ul style="list-style-type: none"> Describe the role of forests in environmental conservation (12m)

TREE IMPROVEMENT & SEED TECHNOLOGY

Tree Improvement and Seed Technology : General concept of tree improvement, methods and techniques, variation and its use, provenance, seed source, exotics; quantitative aspects of forest tree improvement, seed production and seed orchards, progeny tests, use of tree improvement in natural forest and stand improvement, genetic testing programming, selection and breeding for resistance to diseases, insects, and adverse environment; the genetic base, forest genetic resources and gene conservation in situ and ex-situ. Cost benefit ratio, economic evaluation.



2023	<ul style="list-style-type: none"> Explain the following – (i) Lignotuber, (ii), (iii), (iv), (v) <i>Ortet</i> and <i>Ramet</i> [15 M] Discuss the significance of <i>exotics in tree improvement</i>. Name four exotic tree species [8] Define <i>heritability</i> and its types. How does Narrow Sense Heritability differ from Broad Sense Heritability? [10 M] Discuss the scope and future of hybrids in applied tree improvement [10 M] Discuss the <i>significance of variation</i> in tree improvement [10 M]
2022	<ul style="list-style-type: none"> Why is <i>conventional breeding</i> that has a much better role to play in genetic improvement of trees not given much importance in research? (8 m) What are the objectives of <i>progeny testing</i>? Discuss the advantages and disadvantages of different methods of progeny testing (15 m) Discuss the <i>important considerations</i> that are made before choosing a tree improvement approach (10 m)
2021	<ul style="list-style-type: none"> What are the advantages and disadvantages of <i>tree-breeding methods</i> over biotechnological methods? (10m). Give an overview of forest genetic resources and <i>gene conservation programmes</i> in India. Suggest effective practices for sustainable management for quality improvement in Indian Forests (15m).
2020	<ul style="list-style-type: none"> What is meant by <i>accompanied</i> and <i>unaccompanied clonal seed orchards</i>? Why are the

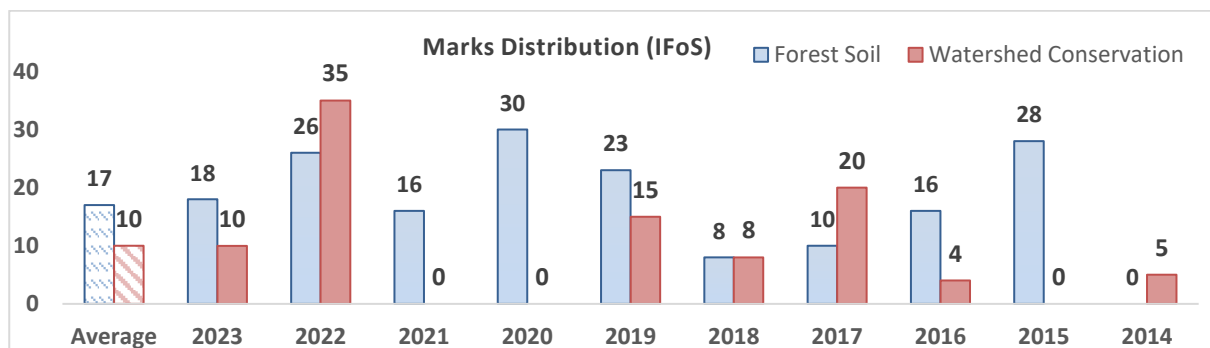
	<p>gains from the two types so different? (8 m).</p> <ul style="list-style-type: none"> • What are the different <i>factors governing the successful introduction of an exotic tree species</i>? (10m). • Describe the advantages, peculiar problems and various <i>steps in tree improvement</i> (15 m).
2019	<ul style="list-style-type: none"> • What are the <i>objectives of tree improvement</i>? Explain in Details the <i>five essential steps</i> of tree improvement (8 m). • Define : (i) Variation, (ii) Selection differentiation, (iii) Selection intensity, (iv) Heritability. How do you increase the genetic gain for a given trait in tree breeding? (15 m) • Name the <i>two phases of tree improvement</i>. as a tree breeder, how do you use these two phases simultaneously to meet the short-term demand of wood-based industries and the long-term demand of establishing seed orchards for a given tree species (15 m).
2018	<ul style="list-style-type: none"> • How would you develop <i>tree improvement programmes</i> for raising productivity in forestry? (10 m). • What is the importance of <i>heritability</i> and how can genetic gain be estimated in tree improvement programme? (10 m). • Describe incomplete <i>mating designs</i> used in tree improvement (10 m). • What are the different <i>selection methods</i> used by the tree breeders? (10 m). • What is a <i>mother tree</i>? How is a plant prepared through vegetative propagation different from a plant raised through seed (15 m).
2017	<ul style="list-style-type: none"> • Write in brief on <i>advanced generation</i> tree improvement (8 m). • Explain <i>General Combining Ability</i> (GCA), <i>Specific Combining Ability</i> (SCA) and their utility (8m). • What are <i>Seed Production Areas</i> (SPA)? Explain the purpose of establishing them. Briefly highlight the advantages and disadvantages of SPA. List the steps involved in establishing SPA (20 m). • List the different components of <i>Phenotypic variation</i>. How are they important for tree breeders? (10 m).
2016	<ul style="list-style-type: none"> • Discuss the reasons for <i>widespread use of exotics</i> for plantations and specific advantages of exotics over native species (8m). • Define <i>Provenance</i>. Discuss the role of Provenance trial in tree improvement and mention different phases of a Provenance trial (10 m). • Define the <i>seed orchard</i>. Write types of seed orchard. List the various aspects considered prior and after establishment of seed orchards for its management (20 m).
2015	<ul style="list-style-type: none"> • How can magnitude and <i>type of variability</i> be manipulated to obtain good gains in some tree characteristics? (8m). • Suggest suitable steps to select <i>exotic species</i> or provenances for plantations (10 m). • Comments upon the relationship of <i>general combining ability</i> and breeding value in forest tree improvement programmes (10 m). • As a community of <i>interbreeding individuals</i>, what parameters would need to be known to describe a population of forest trees? (10 m).
2014	<ul style="list-style-type: none"> • Discuss the <i>role of provenance tests</i> in tree improvement (8m).

	<ul style="list-style-type: none"> Discuss the important factors while planning of <i>seed orchard</i> (10 m).
2013	<ul style="list-style-type: none"> Write a note on <i>pollen dilution zone</i> in seed orchard. Discuss various factors affecting their effectiveness. What are the options available in lieu of pollen dilution zones? (10 m).
2012	<ul style="list-style-type: none"> Discuss the <i>use of tree improvement</i> in natural forest and stand improvement (5 m). Write short notes on – (a) <i>Seed orchard</i>, (b) Exotics in Indian forestry (5 marks each). Write short notes on – (b) <i>breeding arboretum</i> (5 marks).
2011	<ul style="list-style-type: none"> Discuss the importance of <i>tissue culture techniques</i> as a tool in tree improvement (10 m). Describe the <i>regression selection method</i> for plus tree selection in uneven-aged stand (10). Describe the various approaches for obtaining <i>genetically superior seed</i>, giving advantages of each (10 m). Discuss the statement, even in large experiments with many families, <i>heritabilities</i> are not estimated without error (10 m).
2010	<ul style="list-style-type: none"> Discuss the following – (i) selection as a method of tree improvement, (ii) Selection intensity affects the genetic gain (10 m). What do you understand by the term “<i>Provenance trial</i>”? Explain the stepwise procedure for this trial followed in a forest species (10 m). Discuss the possibilities of <i>biotechnological interventions</i> in tree improvement programmes (10m). Why do forest plantations fail? Cite relevant examples [<i>Linked Q</i>]

FOREST SOIL, CONSERVATION & WATERSHED MANAGEMENT

Forests Soils : Classification, factors affecting soil formation; physical, chemical and biological properties. **Soil Conservation** : Definition, causes for erosion; types – wind and water erosion; conservation and management of eroded soils/areas, wind breaks, shelter belts; sand dunes; reclamation of saline and alkaline soils, water logged and other waste lands. Role of forests in conserving soils. Maintenance and build-up of soil organic matter, provision of lopping's for green leaf manuring; forest leaf litter and composting; Role of micro-organisms in ameliorating soils; N and C cycles, VAM.

Watershed Management : Concepts of the watershed; the role of mini-forests and forest trees in overall resource management, forest hydrology, watershed development in respect of torrent control, river channel stabilization, avalanche and landslide controls, rehabilitation of degraded areas; hilly and mountain areas; watershed management and environmental functions of forests; water-harvesting and conservation; groundwater recharge and watershed management; the role of integrating forest trees, horticultural crops, field crops, grass, and fodders.



FOREST SOIL

2023	<ul style="list-style-type: none"> How does moisture influence the soil formation and growth of vegetation? [8 M] Explain the theory of humus formation predominant in forested vegetation [10 M]
2022	<ul style="list-style-type: none"> How does C: N ratio of plant residue in soil influence the rate of decomposition and nitrogen availability to plants? (8m). How does watershed influence the ecology and socio-economic development of a region? (8m) Give a detailed profile of a soil showing various zones and explain the function of each soil zone (10 m)
2021	<ul style="list-style-type: none"> How does soil organic matter decomposed influence forest productivity? (8m) Explain the terms – (a) Cation Exchange Capacity, (b) Salinity & Alkalinity (8m)

2020	<ul style="list-style-type: none"> Write short notes on the following – (a) Soil texture and structure, (b) Soil organic matter, (c) Carbon nitrogen ratio (15m). What is the different soil type found in India? Identify five tree species growing each in Alluvial soils, red soils, Black cotton soils and Arid and desert soils (15m).
2019	<ul style="list-style-type: none"> Soil is an interface of air, minerals, water and life. Comment (8 m). What are the <i>pedogenic process</i> ? Explain the important process of soil formation (15 m).
2018	<ul style="list-style-type: none"> Write in detail about the <i>influence of parent rock in the distribution of tree species</i> (8m) [<i>Linked Q</i>].
2017	<ul style="list-style-type: none"> What are the various methods adopted to conserve the soil on sloping areas? Explain in brief (10 m).
2016	<ul style="list-style-type: none"> Write distinguish features of <i>saline alkaline soil</i> (8m). Explain types of rocks based on formation and minerals based on chemical compositions (8m)
2015	<ul style="list-style-type: none"> Why is a lot of emphasis laid on research relating to soil conservation? Discuss (8 m) Describe different textural classes of soil and the way they affect plant growth (10m). Why is <i>saline-alkaline soil</i> considered problematic? can you suggest any procedure to make it suitable for plant growth ? (10 m).
2012	<ul style="list-style-type: none"> Explain different process of soil erosion. Briefly describe them giving examples as to how the vegetation including trees can help in conserving soil and water (10 m). What is the major ecological consideration in Afforestation (5 m)
2011	<ul style="list-style-type: none"> Explain the different processes of soil erosion. Briefly describe them giving examples as to how the vegetation including trees can help in conserving soil and water (10 m).
2010	<ul style="list-style-type: none"> 'Among the causes of soil erosion some are manageable' comment (5 m). Difference between erodibility and erosivity (5 m). What are <i>saline and sodic soils</i> ? (5m).

**SOIL CONSERVATION &
AFFORESTATION OF DIFFICULT SITES**

2023	<ul style="list-style-type: none"> Explain the benefits of <i>watershed management</i> [10 M]
2022	<ul style="list-style-type: none"> Explain the principles of <i>bioengineering</i> measures for soil and water conservation. Write in brief four common bioengineering techniques for hill and slope stabilization works using plants (20 m). Discuss the components of <i>desert ecosystem</i>. Write steps to control shifting of sand dunes (15 M)
2019	<ul style="list-style-type: none"> What are the characteristics of <i>saline</i> and <i>alkaline soils</i> / Explain the reclamation of saline and alkaline soils with suitable tree species (15 m).

2018	<ul style="list-style-type: none"> What are the measures to be taken into consideration during preparation of earthen <i>check dam</i> in the forest areas ? (8 m).
2017	<ul style="list-style-type: none"> Describe the technique of <i>sand dune fixation</i> in the thar desert. Also mention the choice of species for plantation (15 m). Where are <i>cold deserts</i> found in India? Explain site characteristics encountered in a cold desert and steps suggested to overcome problems in their afforestation (10). [<i>Linked Q</i>]
2016	<ul style="list-style-type: none"> Write the characteristics of <i>cold desert</i>. Discuss soil working and planting techniques for cold desert (8 m) [<i>Linked Q</i>].
2014	<ul style="list-style-type: none"> Specific problem of coastal land and hot deserts [5 M]
2013	<ul style="list-style-type: none"> What are the specific problem of the following wasteland? suggest at least 3 species for planting in each of them (20 m) – (a) Hot desert, (b) Saline alkaline soil, (c) Wetland, (d) Cold desert.
2012	<ul style="list-style-type: none"> Describe the technique of <i>Sand Dune Fixation</i> in the Thar Desert. Also mention the choice of species for planting (15 m). Describe briefly the afforestation techniques adopted for <i>Ravenous lands of Yamuna</i> giving suitable species (5m). Specific problem of coastal land and Hot desert (5m). Give suitable forestry techniques for the reclamation of <i>salt affected soils</i> (8m)
2011	<ul style="list-style-type: none"> Discuss afforestation of <i>inland sand dunes</i> by giving their distribution, site conditions, planting techniques and species suitable in such areas (5 m). Describe the afforestation in an undulating community land situated in the catchment, of a small water reservoir (5 m). How shelterbelt and Wind breaks are helpful in sand dune stabilization and desert control ? (5 m) [<i>Linked Q</i>].

Congratulations

To all our successful candidates in

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Forestry Comprehensive
Course



3
AIR

Swastic Yaduvanshi

Forestry Comprehensive
Course



5
AIR

Vidyanshu Shekhar Jha

Forestry Comprehensive
Course + Test Series



6
AIR

Rohan Tiwari

Forestry Comprehensive
Course



10
AIR

Shashank Bhardwaj

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Course + Test Series



14
AIR

Ankan Bohra

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16
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Indian Forest Service (IFoS) 2023