

APPSC FOREST RANGE OFFICER TOOLKIT

The Ultimate Guide to Success

Module - 1

General Forestry – 1 [Unit VI]

General Forestry

Forest resources

State Forest

Silviculture

Mangroves

Tree Species

Congratulations

To all our successful candidates in

MADHYA PRADESH FOREST SERVICE 2020

Assistant Conservator of Forest (ACF)



1

Ashish Vijaywar



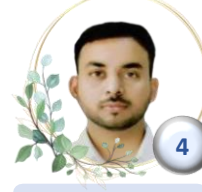
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Ankit
Kumar Jain



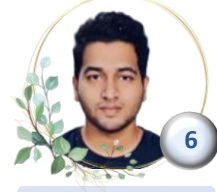
3

Sachindra Singh
Tomar



4

Shubham Soni



6

Rahul Chouhan

5 Out of 6 Selections in MPPSC
Forest (ACF) 2020

RANGE FOREST OFFICER (RFO)



1

Gourav Dubey



2

Saurabh Dubey



3

Pawan Sharma



4

Manish Sharma



5

Kuldeep Baghel



6

Sushil Parmar



7

Lantav Jain



9

Shubham
Raghuvanshi



10

Manisha Mukati



12

Vedant Goutam



13

Parag Jain



16

Shri Ram Dwivedi



19

Anil Kumar



20

Shashi Prakash
Pandey



21

Anubhav Jain



22

Ravindran Gupta



24

Kuldeep Bohare



25

Shubham Tiwari



26

Yogesh Dhote



27

Piyush Shukla



28

Yogendra Singh
Baghel



30

Abhilash Pathak



31

Manav Patidar



33

Omkar Nath Mishra



34

Amit Singh
Chandel

GENERAL FORESTRY

MODULE – 1



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Module - 1

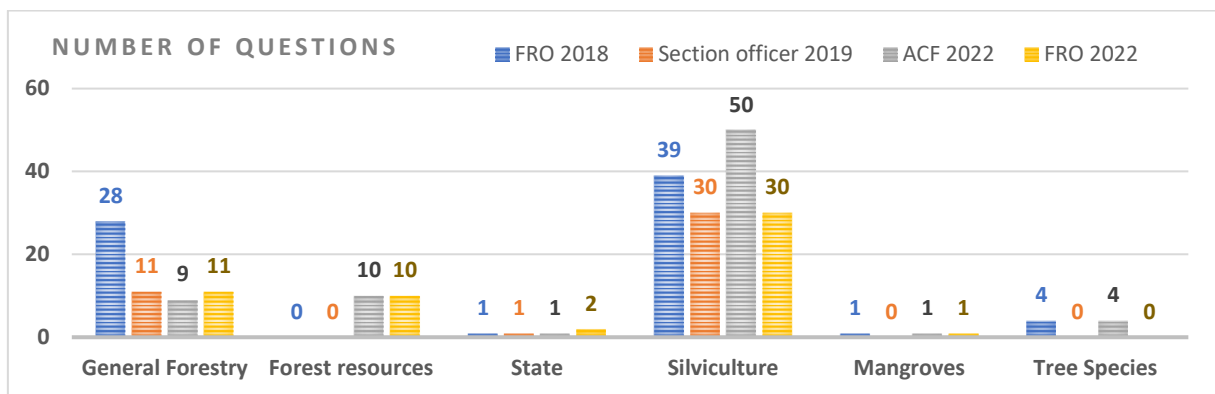
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PAPER ANALYSIS

PYQ ANALYSIS



SYLLABUS

FOREST RESOURCES : Use and over-exploitation, deforestation, important case studies. Timber extraction, mining, dams and their effects on forests and tribal people

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

SILVICULTURE OF THE FOLLOWING ECONOMICALLY IMPORTANT SPECIES grown in Andhra Pradesh such as – (1) *Acacia nilotica* (2) *Azadirachta indica*, (3) *Dendrocalamus strictus*, (4) *Casuarina equisetifolia*, (5) *Dalbergia sisoo*, (6) *Emblia officinalis*, (7) *Eucalyptus spp.*, (8) *Gmelina arborea*, (9) *Pterocarpus marsupium*, (10) *Pterocarpus santalinus* (11) *Santalum album* (12) *Tectona grandis*, (13) *Melia dubia* and (14) *Leucaena leucocephala*.

GENERAL FORESTRY

▶ HISTORICAL BACKGROUNDS

- The oldest teak plantation in the world is located in which state of India? [APPSC (FRO) 2018]
 - Tamil Nadu
 - Andhra Pradesh
 - Karnataka
 - Kerala
- Which tree species of India was heavily exploited during the early British period (1750 - 1900) for

Royal Navy ship building activities? [APPSC (FRO) 2018]

- Terminalia tomentosa*
- Dipterocarpus macrocarpus*
- Tectona grandis*
- Azadirachta indica*

- The first forest act of India that was passed during the British rule in the year [APPSC (FRO) 2022]
 - 1799

- (b) 1865
(c) 1947
(d) 1946
4. Which of the following is the oldest national park in India? [APPSC (FRO) 2022 General Forestry – II]
(a) Bandipur National Park
(b) Kaziranga National Park
(c) Jim Corbett National Park
(d) Kanha National Park
5. The United Nations Conference on the Human Environment was held in which year? [APPSC (FRO) 2018]
(a) 1971
(b) 1972
(c) 1981
(d) 1982
6. The Concurrent List includes which of the following? [APPSC Forest Section Officer 2019]
(a) Forests
(b) Protection of wild animals and birds.
(c) All of the given options
(d) Prevention of cruelty to animals.
7. Who is the founder of the Appiko Movement? [APPSC (FRO) 2018]
(a) Anil Jhoshi
(b) Sunderlal Bahuguna
(c) Panduranga Hegde
(d) Vandana Shiva
8. Forest conservation act and Forest (Conservation) Amendment Bill were passed in the year [APPSC (FRO) 2022]
(a) 1927 and 2001
(b) 1857 and 1947
(c) 1980 and 2023
(d) 1865 and 2000
9. Social Forestry programme was launched in [APPSC (FRO) 2022]
(a) Seventh five year plan
(b) Sixth five year plan
(c) Fifth five year plan
(d) Eighth five year plan
10. The Bhopal gas tragedy took place in the year [APPSC (FRO) 2018]
(a) 1981
(b) 1982
(c) 1983
(d) 1984
11. The policies and guidelines of the Joint Forest Management are enunciated in [APPSC (FRO) 2018]
(a) The National Forest Policy of 1952
(b) The National Forest Policy of 1988
(c) The Forest (Conservation) Act, 1972
(d) The Biodiversity Act, 2002
12. Hazardous waste (Management & handling) rules came into existence in the year _____ [APPSC Forest Section Officer 2019]
(a) 1988
(b) 1989
(c) 1987
(d) 1990
13. The Convention on Biological Diversity entered into force on [APPSC (FRO) 2018]
(a) 29 December 1992
(b) 28 December 1993
(c) 29 December 1993
(d) 28 December 1992
14. Which of the following litigations in the Honourable Supreme Court of India proved to be a landmark in forest conservation? [APPSC (FRO) 2018]
(a) Godavarman Thirumulpad *v/s* Union of India
(b) MC Mehta *v/s* Union of India
(c) TC Mehta *v/s* Union of India
(d) EC Richards *v/s* Forest Ranger Officer, Mettupalayam
15. The Protection of Plant Varieties and Farmers' Rights Act was enacted by the Parliament of India in [APPSC (FRO) 2018]
(a) 2000
(b) 2001
(c) 2002
(d) 2003
16. Disaster Management Act was enacted in the year [APPSC Forest Section Officer 2019]
(a) 2005
(b) 2004
(c) 2003
(d) 2006
17. Which year the Forest Rights Act was enacted? [APPSC Forest Section Officer 2019]
(a) 2002
(b) 2004
(c) 2006
(d) 2008
18. The National Green Tribunal Act was enacted in the year _____ [APPSC Forest Section Officer 2019]

- D) To clearly indicate the inter-relationship of forest economy with rural and tribal economy.
- E) Employment, rights of user and involvement of the local people should not be the priority

Options

- (a) Statements A, B and D are correct
- (b) Statements A, B and E are correct
- (c) Statements C, E and D are correct
- (d) Statements B, C and E are correct
- 27.** Forests are included in the Concurrent List in the (Seventh Schedule) of the Constitution of India. This means that [APPSC (FRO) 2022]
- (a) Only the central government of India can enact the forest laws
- (b) Forests are a state subject so state legislation can enact the laws
- (c) Both, the Centre and States are competent to enact laws for forest conservation and use in India
- (d) The Centre can enact the laws and a State has to implement it
- 28.** Identify the correct option from among the following, that specifies the area to be kept under forest cover in India as per the 'National Forest Policy 1988'. [APPSC (FRO) 2022]
- (a) One-fourth of the total land area of the country is under forest or tree cover, in which the hills and in mountainous regions should aim to maintain one-third of the area under such cover.
- (b) 37% of total land area of the country under forest or tree cover in which the hills and in mountainous regions should aim to maintain 75% of the area under such cover.
- (c) One-third of the total land area of the country under forest or tree cover in which the hills and in mountainous regions should aim to maintain two-third of the area under such cover.
- (d) 37% of total land area of the country under forest or tree cover in which the hills and in mountainous regions should aim to maintain 50% of the area under such cover

► INSTITUTES/BODIES

- 29.** The headquarters of the Indian Institute of Soil and Water Conservation is located at which of the following places? [APPSC (ACF) 2022]

- (a) New Delhi
- (b) Ooty
- (c) Dehradun
- (d) Kota

- 30.** World Agroforestry Centre is located in [APPSC (ACF) 2022]

- (a) Kenya
- (b) South Africa
- (c) Ethiopia
- (d) Zimbabwe

- 31.** Where is the headquarters of the International Centre for Research in Agroforestry (ICRAF) located? [APPSC (FRO) 2018]

- (a) Kathmandu
- (b) New Delhi
- (c) Dhaka
- (d) Nairobi

► DAYS / WEEKS

- 32.** The International Day for Biological Diversity or World Biodiversity Day is a result of the United Nations General Assembly recognising a set of programmes to protect biodiversity. It is celebrated every year on [APPSC (ACF) 2022]

- (a) 24 April
- (b) 24 May
- (c) 22 April
- (d) 22 May

- 33.** The first week of October is annually celebrated as [APPSC (ACF) 2022]

- (a) World Environmental Week
- (b) Biodiversity Week
- (c) World Wildlife Week
- (d) World Heritage Week

- 34.** Earth day is celebrated every year on _____ [APPSC Forest Section Officer 2019]

- (a) March 22nd
- (b) March 21st
- (c) June 5th
- (d) April 22nd

- 35.** When is the world Soil Day celebrated annually? [APPSC (FRO) 2018; APPSC Forest Section Officer 2019]

- (a) 5th July
- (b) 5th September
- (c) 5th April
- (d) 5th December

► FAMOUS PERSONALITIES

36. Who is known as 'the father of biodiversity'? [APPPSC (ACF) 2022]
(a) Edward Johnson
(b) Edward O Wilson
(c) Wilson Knight
(d) Peter Johnson
37. Who is popularly known as the "Waterman of India"? [APPSC (FRO) 2018]
(a) Shirish Apte
(b) Ayyappa Masagi
(c) Rajendra Singh
(d) Aabid surti
38. Who is known as the birdman of India? [APPSC (FRO) 2018]
(a) Richard Meinertzhagen
(b) Sálím Moizuddin Abdul Ali
(c) RC Morris
(d) Norman Boyd Kinnear
39. Who authored the book 'Silent Spring'? [APPSC (FRO) 2018]
(a) Rachel Carson
(b) John Muir
(c) Aldo Leopold
(d) Valmik Thapar
40. Who coined the term 'Biodiversity'? [APPPSC (ACF) 2022]
(a) Lovejoy
(b) Rose Alter
(c) Walter G Rosen
(d) James Wangler
41. The term 'social forestry' was coined by [APPSC (FRO) 2018; APPSC (ACF) 2022]
(a) BT Kang
(b) JC Westoby
(c) Dietrich Brandis
(d) JB Raintree
42. The term social forestry was first used in 1976 in India by [APPSC (FRO) 2018]
(a) the National Commission on Agriculture
(b) the National Commission on Horticulture
(c) the National Commission on Forestry
(d) the National Commission on Silviculture
43. Who coined the term remote sensing? [APPPSC (ACF) 2022]
(a) Harlow Shapley
(b) Walter Baade
(c) Evelyn Pruitt
(d) Kiyotsugu Hirayama
- **SUPERLATIVES / BRANCHES**
44. The tallest tree in the world is [APPPSC (ACF) 2022]
(a) Sequoia sempervirens of California, USA
(b) Pseudotsuga menziesii of Oregon, USA
(c) Eucalyptus vernicosa of Tasmania, Australia
(d) Cedrus deodara of Himachal Pradesh, India
45. _____ is described as "wood of the poor" in India, "friend of the people" in China and "brother" in Vietnam [APPSC Forest Section Officer 2019]
(a) Teak
(b) Acacia
(c) Casuarina
(d) Bamboo
46. What is the science of vegetable production called? [APPSC Forest Section Officer 2019]
(a) Oenology
(b) Olericulture
(c) Pomology
(d) Viticulture
47. _____ is the scientific study of animal behaviour under natural conditions [APPSC Forest Section Officer 2019]
(a) Phytology
(b) Philology
(c) Ethology
(d) Teratology
48. _____ is a mobile app which turns a smartphone into a tool that tracks diseased trees and delivers forest health data to scientists and forest managers around the world [APPSC Forest Section Officer 2019]
(a) Tree tracker
(b) Tree tagger
(c) Tree Book
(d) Tree trails
- **INSTITUTES LOCATION**
49. Where is the Indian Institute of Natural Resins and Gums located? [APPSC (FRO) 2018]
(a) Solan
(b) Dehradun
(c) Ranchi
(d) Saharanpur
50. Where is the Central Silk Technological Research Institute situated? [APPSC (FRO) 2018]
(a) Itanagar
(b) Bengaluru
(c) Pune

- (d) Mysuru
51. Where is the Indian Institute of Forest Management situated? [APPSC (FRO) 2018]
- (a) Bhopal
(b) Mumbai
(c) Kozhikode
(d) Indore
52. Where is the Indian Society for Ecological Economics situated? [APPSC (FRO) 2018]
- (a) Delhi
(b) Chennai
(c) Bengaluru
(d) Kolkata
53. Where is the Wildlife Institute of India situated? [APPSC (FRO) 2018]
- (a) Mussoorie
(b) Haridwar
(c) Bangalore
(d) Dehradun
54. Where is the headquarters of the CSIR-National Environmental Engineering Research Institute situated? [APPSC (FRO) 2018]
- (a) Indore
(b) New Delhi
(c) Nagpur
(d) Chennai
55. Where is the Central Road Research Institute situated? [APPSC (FRO) 2018]
- (a) Pune
(b) New Delhi
(c) Mumbai
(d) Nagpur

► MISLANIOUS

56. What is the full form of CITES? [APPSC (FRO) 2018]
- (a) Conservation of International Trade in Endangered Species of Wild Fauna and Flora
(b) Convention on International Trade in Endangered Species of Wild Fauna and Flora
(c) Convention on International Trade in Extant Species of Wild Fauna and Flora
(d) Conservation of International Trade in Extant Species of Wild Fauna and Flora
57. Which of the following missions is NOT under the National Action Plan on Climate Change? [APPSC (FRO) 2018]
- (a) Sustainable Habitat
(b) Water Mission

- (c) Green India
(d) Green GDP

FOREST RESOURCES

58. Which of the following is responsible for surveying conducting survey and assessment of forest resources in the country [APPSC (FRO) 2022 General Forestry – II]
- (a) Forest Research Institute (FRI)
(b) Forest Survey of India (FSI)
(c) Agriculture Survey of India (ASI)
(d) Agriculture and Forest Survey of India (AFSI)
59. What is the spatial resolution of LISS-III sensor? [APPSC (ACF) 2022 General Forestry – II]
- (a) 24 m
(b) 80 m
(c) 30 m
(d) 10 m

FOREST COVER

60. According to ISFR (2019), what is the percentage of the total forest cover in India? [APPSC (RFO) General Forestry Paper - II 2018]
- (a) 25.32%
(b) 21.67%
(c) 23.17%
(d) 24.78%
61. The forest cover of India as per FSI report 2021 is 7,31,789 Sq. Km. As per this report what is the percentage of forest cover? [APPSC (FRO) 2022 General Forestry – II]
- (a) 33%
(b) 25.71%
(c) 21.71%
(d) 30.71%
62. Which of the following states shows the maximum loss in forest cover as per ISFR 2021? [APPSC (ACF) 2022 General Forestry – I]
- (a) Tripura
(b) Arunachal Pradesh
(c) Himachal Pradesh
(d) Manipur
63. Forest Survey of India (FSI) classifies forests as per canopy density. As per canopy density, the forests of India are classified as [APPSC (FRO) 2022 General Forestry – II]
- (A) Very Dense Forests have a density of _____

- (B) Moderately Dense Forests have a density of _____
- (C) Open Forests have a density of _____
- (D) Scrub Forests have a density of _____

Options

- (a) (A) 100% and above 60%; (B) 40% to 60%; (C) 30% to 40%; (D) 10% to 30%
- (b) (A) 70% and above; (B) 40% and more but less than 70%; (C) 10% and more but less than 40%; (D) less than 10%
- (c) (A) 90% to 60%; (B) 60% to 50%; (C) 50% to 40%; (D) 40% to 30%
- (d) (A) 80% and above; (B) 50% and above; (C) 30% and above; (D) 20% and above

TREE COVER (TOF)

64. Tree cover is defined as [APPSC (ACF) 2022 General Forestry – I]
- (a) Isolated trees and small patches of trees, which are less than 1 ha in area and occurring inside the recorded forest areas.
- (b) Isolated trees and small patches of trees, which are less than 2 ha in area and occurring outside the recorded forest areas.
- (c) Isolated trees and small patches of trees, which are less than 1 ha in area and occurring outside the recorded forest areas.
- (d) Isolated trees and small patches of trees, which are less than 1.5 ha in area and occurring inside the recorded forest areas.
65. All trees present outside the recorded forest area (RFA) irrespective of their number and patch size, are termed as [APPSC (FRO) 2022 General Forestry – I]
- (a) Forest cover
- (b) Trees outside forest
- (c) Tree cover
- (d) Agroforestry
66. As per ISFR 2021, the total forest and tree cover in India is _____ of the geographical area of the country [APPSC (ACF) 2022 General Forestry – I]
- (a) 24.62%
- (b) 28.62%
- (c) 21.50%
- (d) 23.50%
67. Two key findings of India State of Forest Report (ISFR) 2021 are given here. Select the most appropriate option to fill in the blanks.

The Total Forest and tree cover is _____ of the geographical area of the country. As compared to ISFR 2019, the current assessment shows an increase of _____ forest and tree cover put together at the national level. [APPSC (FRO) 2022 General Forestry – II]

- (a) 24.62% ; 0.28%
- (b) 19.62% ; 1.28%
- (c) 33% ; 2%
- (d) 21.25% ; 3%

68. As per the India State of Forest Report (ISFR) 2021, trees outside forests (TOF) are the main source of wood produced in the country, especially from the agroforestry sector. Which state is leading in extent of TOF (in area) [APPSC (FRO) 2022 General Forestry – I]
- (a) Maharashtra
- (b) Andhra Pradesh
- (c) Odisha
- (d) Uttar Pradesh

STATE DATA

69. According to India State of Forest Report (ISFR) 2021 given by the Forest Survey of India, the recorded forest area of Andhra Pradesh is [APPSC (ACF) 2022 General Forestry – I]
- (a) 37,258 km²
- (b) 36,258 km²
- (c) 35,258 km²
- (d) 38,258 km²
- ~~70. As per the ISFR 2021, the forest cover of Andhra Pradesh is _____ of the total geographical area of the country [APPSC (ACF) 2022 General Forestry – I]~~
- ~~(a) 0.1828~~
- ~~(b) 0.1645~~
- ~~(c) 0.195~~
- ~~(d) 0.172~~
71. As per the ISFR 2021, which of the following forest types has the maximum area in Andhra Pradesh? [APPSC (ACF) 2022 General Forestry – I]
- (a) Dry deciduous scrub forests
- (b) Southern thorn forests
- (c) Southern moist mixed deciduous forests
- (d) Southern dry mixed deciduous forests

CARBON STOCK

72. As per India State of the Forest Report (ISFR) 2021, the total carbon stock in forest is estimated as [APPSC (FRO) 2022 General Forestry – I]
- (a) 10,204 million tonnes
 - (b) 9204 million tonnes
 - (c) 8204 million tonnes
 - (d) 7204 million tonnes

FOREST FIRE MONITORING

73. In 2020, _____ developed a cost-effective and time-efficient methodology for the rapid assessment of forest areas affected by fire. In this methodology, fire burnt forest areas show a conspicuous signature on satellite images. [APPSC (FRO) 2022 General Forestry – II]
- (a) Forest Survey of India
 - (b) UNO
 - (c) Forest fire-prone States of India
 - (d) IIT Delhi
74. Which sensors are used by the Forest Survey of India to identify forest fires in India? [APPSC (ACF) 2022 General Forestry – II]
- (a) High-Resolution Infra-Red Radiation Sounder and Suomi-National Polar-orbiting Partnership - Visible Infrared Imaging Radiometer Suite
 - (b) Moderate Resolution Imaging Spectroradiometer and Suomi-National Polar-orbiting Partnership - Visible Infrared Imaging Radiometer Suite
 - (c) High-Resolution Optical Imager and Moderate Resolution Imaging Spectroradiometer
 - (d) High-Resolution Optical Imager and High-Resolution Infra-Red Radiation Sounder

GLOBAL DATA

75. As per the 'Global Forest Resource Assessment' (GFRA) report 2020 given by FAO, the top two countries with respect to forest area in the world are [APPSC (FRO) 2022 General Forestry – I]
- (a) Russia and Brazil
 - (b) Russia and Canada
 - (c) Canada and USA
 - (d) USA and Brazil
76. The forests that predominantly have a limited number of conifer species beside few deciduous genera, and occupy around 17% of the Earth's land surface in the circumpolar belt of the far Northern

Hemisphere with long and very cold winters, are called _____ forests [APPSC (FRO) 2022 General Forestry – I]

- (a) Semi-Evergreen
 - (b) Boreal
 - (c) Cloud
 - (d) Sub-Alpine
77. According to Global Forest Resource Assessment (GFRA) report 2020, considering the forest area, at which position is India ranked among different countries of the world? [APPSC (ACF) 2022 General Forestry – I]
- (a) 5th
 - (b) 10th
 - (c) 3rd
 - (d) 8th
78. According to the Global Forest Goals Report 2021, which country has converted nearly 35% of its total forest area to community forests, due to which the forest area has increased and the rate of deforestation has decreased? [APPSC (ACF) 2022 General Forestry – I]
- (a) Nepal
 - (b) Bhutan
 - (c) Indonesia
 - (d) Philippines
79. According to the CIFOR-ICRAF Annual Report - 2020, on an average _____ species are driven to extinction in the world's tropical rainforests every day [APPSC (ACF) 2022 General Forestry – I]
- (a) 150
 - (b) 137
 - (c) 146
 - (d) 127

STATE-BASED QUESTIONS

80. State bird of Andhra Pradesh is [APPSC (ACF) 2022]
- (a) Psittacula krameri
 - (b) Coracias garrulus
 - (c) Coracias benghalensis
 - (d) Psittacula himalayana
81. Dipterocarpus retusus, an important timber plant, is the state tree of [APPSC (FRO) 2018]
- (a) Assam
 - (b) Arunachal Pradesh
 - (c) Meghalaya
 - (d) Tripura

82. In which year, Andhra Pradesh Forest Act come into force? [APPSC Forest Section Officer 2019]
- 1977
 - 1967
 - 1958
 - 1972
83. Andhra Pradesh Water, Land Trees Act, 2002 (APWALTA) came into force on [APPSC (FRO) 2022]
- 15th June 2002
 - 19th April 2002
 - 15th June 2004
 - 6th November 2002
84. Which of the following statements is true about Girijan Cooperative Corporation? [APPSC (FRO) 2022]
- It is the marketing wing of Andhra Pradesh Forest Department.
 - It is the main purchaser of Bamboo from Andhra Pradesh Forest Department.
 - It pays royalty to the Andhra Pradesh Forest Department for the collection and sale of non-timber forest products.
 - It has full right to collect and sale non-timber forest products in Andhra Pradesh
- FOREST FORESTRY SILVICULTURE**
85. A virgin forest is a _____ forest [APPPSC (ACF) 2022]
- Man-made
 - Social
 - Natural
 - Recreational
86. The various species which form a forest crop and their proportion in it is called [APPPSC (ACF) 2022]
- Composition
 - Selection
 - Yield
 - Development
87. _____ is a species of inferior quality or size, of relatively little Silvicultural value or importance, associated with the principal species [APPSC Forest Section Officer 2019]
- Accessory species
 - Lesser species
 - Mediocre species
 - Auxiliary species
88. The sum (by number or volume) of all the trees growing in a forest, or a specified part of it is [APPSC (FRO) 2018; APPSC (ACF) 2022]
- Yield
 - Growing stock
 - Number of trees
 - Crop volume
89. The practice of forestry in all its aspects on farm and village lands, generally more or less integrated with other farm operations, is called [APPPSC (ACF) 2022]
- Village forestry
 - Community forestry
 - Farm forestry
 - Social forestry
90. The scope of social forestry does not include which type of forestry? [APPSC (FRO) 2018]
- Farm Forestry
 - Community Woodlots
 - Community Reserve
 - Extension Forestry
91. Silviculture originated in which continent? [APPSC (FRO) 2018]
- Asia
 - Europe
 - North America
 - South America
92. Which of the following is the regulative function of forest resources? [APPPSC (ACF) 2022]
- Storage and release of gases
 - Production of timber
 - Provision of minor forest products
 - Conservation of soil and water
93. Which of the following is **NOT** a provisioning service obtained from forests? [APPSC (FRO) 2018]
- Fuel wood
 - Nutrient cycling
 - Fibre
 - Food
- ✎ In the context of ecosystem services, *Provisioning Services* refer to the *Tangible Products* and materials that humans obtain directly from ecosystems, e.g., Food, Raw Materials, Fresh water, Medicine, etc.
94. Which type of forest tends to have the highest carbon sequestration potential? [APPSC (FRO) 2022]
- Young and rapidly growing forests
 - Mature and stable forests
 - Deforested areas
 - Plantations with single-species trees
- ✎ *Mature and Stable Forests*, also known as **climax forests**, are forests that have reached its maximum

development in terms of structure and species composition. Mature forests have reached a more stable state. Their growth rate has slowed, so their carbon sequestration rate is lower than that of younger forests. In contrast, *Young and Rapidly Growing Forests* have a high rate of carbon uptake because the trees are actively photosynthesizing and growing. They are building biomass quickly, which means more carbon is being pulled from the atmosphere and stored in the trees.

Official Answer : **(b) Mature and stable forests**

In Our opinion, **(a) Young and rapidly growing forests.**

LOCALITY FACTORS

95. The relative productive capacity of an area for a particular plant species is called _____. [APPSC (ACF) 2022]
- (a) Site quality
 - (b) Site index
 - (c) Site Productivity
 - (d) Site production
96. Which one of the following is the most important criteria for determining the site quality of an area? [APPSC Forest Section Officer 2019]
- (a) Crop height
 - (b) Crop diameter
 - (c) Canopy density
 - (d) Top height of the Crop

CLIMATIC FACTORS

97. What is the process by which forests help in carbon sequestration? [APPSC (FRO) 2022]
- (a) Photosynthesis
 - (b) Respiration
 - (c) Combustion
 - (d) Decomposition
98. The energy of sunlight is first absorbed by the pigments of the plant. All pigments active in photosynthesis are found in the [APPSC (FRO) 2018]
- (a) Golgi apparatus
 - (b) Mitochondria
 - (c) Chloroplast
 - (d) Amyloplast
99. Etiolation of plants in greenhouses can be avoided by managing [APPSC (FRO) 2018]
- (a) Humidity
 - (b) Temperature

- (c) Light
 - (d) micronutrients
100. Response in the development of an organism to relative duration of day and night is termed as [APPSC (ACF) 2022]
- (a) Photosynthesis
 - (b) Photocycle
 - (c) Photoperiodism
 - (d) Photosensitivity
101. Flowering of trees at an early age is known as [APPSC Forest Section Officer 2019]
- (a) Dioecious flowering
 - (b) Precarious flowering
 - (c) Monocarpic flowering
 - (d) Precocious flowering
102. The rapid diameter increment of trees due to light stimulus following increment fellings is known as ____ [APPSC Forest Section Officer 2019]
- (a) Induced increment
 - (b) Quick increment
 - (c) Forced increment
 - (d) Light increment
103. _____ is a light demander species of tropical moist deciduous forests [APPSC (ACF) 2022]
- (a) *Toona ciliate*
 - (b) *Dalbergia sissoo*
 - (c) *Pterocarpus marsupium*
 - (d) *Artocarpus chama*
104. How can one prevent a heatstroke? [APPSC (FRO) 2022 General Forestry – II]
- (a) Gradually letting one's body acclimatise to warm temperatures over several weeks if one has to be in hot conditions for work or sports
 - (b) Always carrying ice packs while outside
 - (c) Wearing wet inner clothes
 - (d) Keeping your head and shoes wet
105. According to IMD, drought refers to any area when the rainfall deficiency in that area is _____ of its long-term normal [APPSC (ACF) 2022]
- (a) $\geq 30\%$
 - (b) $\geq 26\%$
 - (c) $\leq 24\%$
 - (d) $\leq 20\%$
106. The drought tolerance in plants is due to [APPSC (ACF) 2022]
- (a) Potassium
 - (b) Manganese
 - (c) Nitrogen

- (d) Boron
- ✎ It helps in the opening and closing of stomata = Maintaining turgor pressure + increasing root growth
- 107.** The plants in deserts are deep rooted. They obtain a significant portion of the water that they need from the zone of saturation. These plants are called [APPSC (ACF) 2022 General Forestry – I]
- (a) Spermatophytes
(b) Phaeophytes
(c) Phreatophytes
(d) Phragmatophytes
- 108.** _____ refers to a technique of lowering groundwater in waterlogged areas by raising tree plantations [APPSC Forest Section Officer 2019]
- (a) Bio-exhaustion
(b) Bio-drainage
(c) Bio-depletion
(d) None of the given options
- 109.** For determination of average annual precipitation in a catchment or basin, the best accurate method is [APPSC (FRO) 2022]
- (a) Arithmetical method
(b) Thiessen's mean method
(c) Isohyetal method
(d) None of these
- 110.** The line joining the places having equal rainfall is called [APPSC (ACF) 2022]
- (a) Isobath
(b) Isotherm
(c) Contour line
(d) Isohyet
- 111.** What is the average annual precipitation on Earth? [APPSC (FRO) 2018]
- (a) 1200 mm
(b) 1100 mm
(c) 1000 mm
(d) 1500 mm
- 112.** Which of the following statements is/are correct? [APPSC (FRO) 2022]
- A) The mass rainfall curve is a plot between the accumulated rainfall at a station as ordinate and time as abscissa, plotted in chronological order.
- B) The hyetograph is the graphical representation of rainfall versus time.
- Options
- (a) Only statement B is correct
(b) Both statements A and B are incorrect
(c) Only statement A is correct
(d) Both statements A and B are correct
- 113.** Hygrometer in a greenhouse is used for measuring [APPSC Forest Section Officer 2019]
- (a) Temperature
(b) Light intensity
(c) Relative humidity
(d) Wind speed
- 114.** Which of the following devices measures the pressure of groundwater? [APPSC (FRO) 2018]
- (a) Barometer
(b) Piezometer
(c) Rheometer
(d) Manometer
- 115.** _____ measure the amount of tension or pull plant roots are exerting on the soil water and how tightly water is held by the soil [APPSC (FRO) 2018]
- (a) Time domain reflectometers
(b) Neutron probes
(c) Piezometer
(d) Tensiometers
- 116.** Which of the following instrument is used for measuring the direction of the wind? [APPSC Forest Section Officer 2019]
- (a) Anemometer
(b) Barometer
(c) Weather-cock
(d) Aneroid barometer
- 117.** Which of the following statements is INCORRECT? [APPSC (FRO) 2018]
- (a) Evaporation is significant in arid regions.
(b) Transpiration is significant in humid regions.
(c) Evaporation is less on humid days.
(d) Evapotranspiration is often used synonymously with the consumptive use
- 118.** In a greenhouse, the temperature of the leaf surfaces are kept above the dew point to prevent [APPSC (FRO) 2018]
- (a) Condensation
(b) Evaporation
(c) Transpiration
(d) Precipitation

EDAPHIC FACTORS

119. Nitrogen-fixing ability of Casuarina is attributable to [APPSC Forest Section Officer 2019]
 (a) Azotobacter
 (b) Azospirillum
 (c) Frankia
 (d) Rhizobium
120. _____ is the process of converting ammonia to nitrate [APPSC (FRO) 2022]
 (a) Nitrification
 (b) Assimilation
 (c) Ammonification
 (d) Denitrification
121. The concentration of the essential element below which plant growth is retarded is called [APPSC (ACF) 2022]
 (a) Critical concentration
 (b) Crucial concentration
 (c) Extremely low concentration
 (d) Low concentration
122. Nitrogen constitutes 25% of dry weight of plants. The source of nitrogen in soil is [APPSC (ACF) 2022]
 (a) Atmosphere only
 (b) Atmosphere and organic matter
 (c) Bacteria only
 (d) Fungal association of plants
123. Which of the following is NOT a macronutrient? [APPSC (FRO) 2018]
 (a) Nitrogen
 (b) Phosphorus
 (c) Magnesium
 (d) Manganese
124. Which among the micronutrient is essential for plant growth and metabolism [APPSC (FRO) 2022]
 (a) Potassium
 (b) Calcium
 (c) Manganese
 (d) Magnesium
125. Inhibition of primary root growth in plants is often associated with the deficiency of [APPSC (FRO) 2018]
 (a) Nitrogen
 (b) Phosphorus
 (c) Potassium
 (d) Iron
126. Xylia xylocarpa occurs gregariously in which of the following parent rock types? [APPSC (FRO) 2018]
 (a) Quartzite

- (b) Limestone
 (c) Laterites
 (d) Mica schist

127. What type of pan is formed in the alluvial soils of Uttar Pradesh and black cotton soils of the Deccan region? [APPSC (ACF) 2022]
 (a) Silican
 (b) Kankar
 (c) Podsollic
 (d) Lateritic iron
128. In Central India, *Soymida febrifuga*, *Acacia leucophloea* and *Chloroxylon swietenia* are indicator plants of [APPSC (ACF) 2022]
 (a) Clayey soil
 (b) Lime rich soil
 (c) Stiff kankar clay
 (d) Alluvial soil

BIOTIC FACTORS

129. _____ is a total stem-parasite [APPSC (ACF) 2022]
 (a) Viscum
 (b) Cuscuta
 (c) Loranthus
 (d) Arceuthobium
130. Match the following ecological processes that occur in forests [APPSC (FRO) 2022]
- | | Organism 1 | Organism 2 |
|-----------------|------------|------------|
| A) Commensalism | 1) + | 1) - |
| B) Amensalism | 2) + | 2) + |
| C) Predation | 3) + | 3) 0 |
| D) Mutualism | 4) - | 4) 0 |
- (a) (A-1), (B-2), (C-3) and (D-4)
 (b) (A-4), (B-3), (C-2) and (D-1)
 (c) (A-1), (B-2), (C-4) and (D-3)
 (d) (A-3), (B-4), (C-1) and (D-2)
131. In South India which insect is used to control *Opuntia* spp, a weed, in thorn forests? [APPSC (FRO) 2022]
 (a) *Orthezia insignis*
 (b) *Cosmopterix pulchrimella*
 (c) *Dactylopius coccus*
 (d) *Estigmene chinensis*

✎ Cochineal insects (*Dactylopius* spp.) cling to the outside of the host plant and (similar to how mosquitos' function on people) takes the plant's food and moisture out, killing it. This method is used

to limit the development of the Opuntia plant, often known as the prickly pear.



- 132.** Loranthus is a _____ which causes damage to forest trees [APPSC Forest Section Officer 2019]
- (a) Epiphyte
 - (b) Weed
 - (c) Parasite
 - (d) Climber

FOREST HYDROLOGY

- 133.** Match the following hydrological events and their measurement method/ the factors they depend on [APPSC (FRO) 2022]

Hydrological event	Measurement and/or dependent upon
A) Inconsistency of rainfall data	1) Topography
B) Runoff	2) Temperature
C) Evaporation	3) Double mass curve technique

- (a) A-1, B-2, C-3
 - (b) A-3, B-1, C-2
 - (c) A-3, B-2, C-1
 - (d) A-2, B-3, C-1
- 134.** _____ is a set of characteristics curve that describe the rainfall characteristics specific to the region [APPSC (FRO) 2022]
- (a) Peak-Flow
 - (b) Intensity-Duration-Frequency
 - (c) Peak-Erodibility
 - (d) Peak-Intensity-Flow
- 135.** Understanding of relationships between hydrological and biological processes at different scales to improve water security, enhance biodiversity and further opportunities for sustainable development by lessening ecological threats and maximising greater harmony within catchment processes, is called [APPSC (FRO) 2022]

- (a) Ground water hydrology
- (b) Hydroinformatics
- (c) Hydrogeology
- (d) Ecohydrology

FOREST STAND

- 136.** Lignotubers are modified stems developed from double accessory buds in the axils of cotyledons found in [APPSC (ACF) 2022]
- (a) Dalbergia sissoo
 - (b) Acacia arabica
 - (c) Albizia chinensis
 - (d) Eucalyptus tereticornis
- 137.** Lignotubers are underground swellings found in most species of _____ [APPSC Forest Section Officer 2019]
- (a) Eucalyptus
 - (b) Casuarina
 - (c) Poplar
 - (d) Bamboos

► **GROWTH STAGES**

- 138.** A forest plant grown from seed, that attains a height of around six inches and has a few leaves, is called a _____ [APPSC (FRO) 2022]
- (a) Tree
 - (b) Sapling
 - (c) Seedling
 - (d) Pole

► **REPRODUCTION**

- 139.** In which of the following tree species is the pollination of flowers done by insects? [APPSC (ACF) 2022]
- (a) Juglans regia
 - (b) Bombax ceiba
 - (c) Tectona grandis
 - (d) Cedrus deodara
- 140.** Flowers that are pollinated by bees are known as [APPSC (FRO) 2018]
- (a) Chiropterophily
 - (b) Melittophily
 - (c) Myophily
 - (d) Ornithophily
- 141.** Which of the following is a water-pollinated plant? [APPSC (FRO) 2018]
- (a) Water hyacinth
 - (b) Hydrilla

- (b) Dominant trees
- (c) Dominated trees
- (d) Suppressed trees

155. _____ is using a growth model to estimate the development of a stand through time under alternative conditions or cutting practices [APPSC Forest Section Officer 2019]
- (a) Validation
 - (b) Monitoring
 - (c) Simulation
 - (d) Evaluation

FOREST SUCCESSION

156. The patches of pure *Anogeissus latifolia* in sal forests is an example of [APPSC (ACF) 2022]
- (a) Sub climax
 - (b) Preclimax
 - (c) Edaphic climax
 - (d) Post climax
157. Match the following authors and succession theories [APPSC (FRO) 2022]

A) Clements	(1) Poly climax theory
B) Tansley	(2) Climax pattern and vegetation gradation theory
C) Aubreville	(3) Mosaic theory
D) Whittaker	(4) Climatic climax theory

- (a) (A-3), (B-2), (C-1), (D-4)
 - (b) (A-1), (B-2), (C-3), (D-4)
 - (c) (A-4), (B-1), (C-3), (D-2)
 - (d) (A-3), (B-1), (C-4), (D-2)
158. 'Ecesis' is process of succession that represents [APPSC (FRO) 2022]
- (a) Migration of plants and animals to a new habitat
 - (b) Reaction of plants and animals to a new habitat
 - (c) Plants and animals refuse the new habitat
 - (d) Establishment of plants and animals in a new habitat
159. In Sal (*Shorea Robusta*) climax forests of India, *Xylia xylocarpa* species is regenerating dominantly. This succession represents [APPSC (FRO) 2022]
- (a) Climatic succession
 - (b) Edaphic succession
 - (c) Climax succession
 - (d) Retrogressive succession

160. Erosion, Physiography, Elevation and subsidence are the _____ causes of Primary Succession [APPSC Forest Section Officer 2019]
- (a) Initial
 - (b) Final
 - (c) Continuous
 - (d) Secondary
161. Plants adapted to a life in a dry or physiologically dry habitat are known as [APPSC (FRO) 2018]
- (a) Mesophytes
 - (b) Hygrophytes
 - (c) Xerophytes
 - (d) Hydrophytes

FOREST TYPES

162. The tropical forests in India are differentiated into _____ groups [APPSC Forest Section Officer 2019]
- (a) Seven
 - (b) Eight
 - (c) Nine
 - (d) Five
163. Champion and Seth classified Indian forests on the basis of climatic data and vegetation. Into how many groups did they make this classification? [APPSC (ACF) 2022]
- (a) 20
 - (b) 16
 - (c) 7
 - (d) 25
164. According to Champion and Seth Classification, 1968, there are _____ Major groups of forests in India [APPSC Forest Section Officer 2019]
- (a) Twelve
 - (b) Eight
 - (c) Sixteen
 - (d) Five
165. Identify the forests in which teak is the dominant species [APPSC (ACF) 2022]
- (a) Tropical evergreen forests
 - (b) Tropical thorn forests and scrubs
 - (c) Tropical deciduous forests
 - (d) Mangrove forests
166. Shola are tropical montane forests found in the higher elevation hill regions of the [APPSC (FRO) 2018]
- (a) North-East India
 - (b) Himalayas
 - (c) Western Ghats

(d) North Bengal

167. A forest growing at or near seashores, beach forests and tidal forests are a type of [APPPSC (ACF) 2022]
- (a) tropical moist forest
 - (b) tropical wet evergreen forest
 - (c) littoral and swamp forest
 - (d) dry evergreen forest

FOREST REGENERATION

168. What is the main objective of afforestation? [APPSC (FRO) 2022]
- (a) Increase urban green spaces
 - (b) Improve soil fertility
 - (c) Restore and expand forest cover
 - (d) Provide timber for commercial purposes
169. Afforestation is a long-term solution to [APPSC (FRO) 2022]
- (a) Urbanisation
 - (b) Desertification
 - (c) Overfishing
 - (d) Industrialisation
170. *Adiantum caudatum* is propagated by _____ [APPSC (FRO) 2022]
- (a) Leaf-tip and rhizome
 - (b) Gemmae
 - (c) Gootee
 - (d) Cutting
171. The seed of oaks is dispersed by [APPPSC (ACF) 2022]
- (a) Birds
 - (b) Water
 - (c) Gravity
 - (d) Animals
172. _____ are the good seed years of *Shorea robusta* [APPPSC (ACF) 2022]
- (a) 1-2 years
 - (b) 6-7 years
 - (c) 8-10 years
 - (d) 3-5 years
173. In moist teak forests, adverse effects on the natural regeneration of teak are due to [APPPSC (ACF) 2022]
- (a) Indiscriminate use of weedicides
 - (b) Poor management of trees
 - (c) Indiscriminate tree felling
 - (d) Indiscriminate fire protection
174. Which of the following trees species has strong coppicing ability? [APPPSC (ACF) 2022]
- (a) *Emblia officinalis*

(b) *Abies pindrow*

- (c) *Populus ciliata*
- (d) *Madhuca latifolia*

175. Which one of the following is a bad coppicee? [APPSC Forest Section Officer 2019]
- (a) *Casuarina equisetifolia*
 - (b) *Butea monosperma*
 - (c) *Emblia officinalis*
 - (d) *Prosopis juliflora*
176. Which of the following species is pollarded to produce shoots suitable for fibre extraction in Andhra Pradesh? [APPPSC (ACF) 2022]
- (a) *Xylia xylocarpa*
 - (b) *Butea monosperma*
 - (c) *Anogeissus latifolia*
 - (d) *Hardwickia binata*
177. Dying back phenomenon is not observed in one of the following species [APPSC Forest Section Officer 2019]
- (a) *Shorea robusta*
 - (b) *Terminalia tomentosa*
 - (c) *Pterocarpus santalinus*
 - (d) *Tectona grandis*
178. The type of germination of seed where cotyledons emerge out of the soil is called germination [APPSC Forest Section Officer 2019]
- (a) Mesocotyl
 - (b) Epigeal
 - (c) Hypogeal
 - (d) Hypocotyl
179. The forest crop is renewed by which of the following? [APPSC (FRO) 2022]
- A) Natural regeneration
 - B) Afforestation
 - C) Agroforestry
 - D) Reforestation
- (a) A, C, and D
 - (b) B, C, and D
 - (c) A, B, and D
 - (d) A, B, C, and D

CHOICE OF SPECIES

180. Which type of trees is commonly planted in afforestation projects? [APPSC (FRO) 2022]
- (a) Exotic and invasive species
 - (b) Endangered and rare species
 - (c) Native and indigenous species
 - (d) Fruit-bearing trees

181. Eucalyptus deglupta does not occur in [APPSC (FRO) 2018]

- (a) Australia
- (b) Philippines
- (c) Papua New Guinea
- (d) Indonesia

182. Is a multipurpose tree species which is native to Australia [APPPSC (ACF) 2022]

- (a) *Robinia pseudoacacia*
- (b) *Prosopis juliflora*
- (c) *Leucaena leucocephala*
- (d) *Casuarina equisetifolia*

SEED TECHNOLOGY

183. Seed treatment by which the hard seed coat is ruptured or weakened, mechanically or chemically is called [APPSC Forest Section Officer 2019]

- (a) Stratification
- (b) Pulverisation
- (c) Scarification
- (d) Briquetting

184. Alternate wetting and drying is the seed treatment followed for [APPSC Forest Section Officer 2019]

- (a) *Tectona grandis*
- (b) *Prosopis juliflora*
- (c) *Ceiba pentandra*
- (d) *Azadirachta indica*

185. Pre-germination seed treatment involves soaking hard and impermeable seeds in concentrated [APPSC (FRO) 2018]

- (a) Sulphuric acid
- (b) Boric acid
- (c) Citric acid
- (d) Oxalic acid

186. Certified seed is the progeny of [APPSC Forest Section Officer 2019]

- (a) Breeder seed
- (b) Nucleus seed
- (c) Foundation seed
- (d) None of the given options

FOREST NURSERY

187. Is a tabular statement showing the order and extent of all works to be carried out during the year [APPSC Forest Section Officer 2019]

- (a) Two year Plan of operations
- (b) Biannual plan of operations

- (c) Monthly Plan of Operations
- (d) Annual Plan of operations

188. Which of the following statements is INCORRECT regarding selection of a site for a nursery? [APPPSC (ACF) 2022]

- (a) The site should be situated near a source of adequate water supply.
- (b) The site should be near a road for easy transportation of nursery plants.
- (c) The soil should be well-drained sandy loam.
- (d) In the Western Himalayas, southern aspect should be preferred, but towards higher limits of the altitudinal zone of the species, northern aspects are suitable

189. In moister areas, nursery beds are usually raised _____ above the ground level [APPPSC (ACF) 2022]

- (a) 5 to 10 cm
- (b) 20 to 25 cm
- (c) 10 to 15 cm
- (d) 15 to 20 cm

190. Root trainers used in nurseries are used [APPPSC (ACF) 2022]

- (a) To reduce the aboveground height of transplanting stock
- (b) To allow air pruning of roots and promote an extensive and stronger root system
- (c) To produce adventitious roots in plants
- (d) To encourage lignotuber formation in plants

191. Sowing of seeds in shallow holes made with suitable instruments at definite intervals is called [APPPSC (ACF) 2022]

- (a) Patch sowing
- (b) Pit sowing
- (c) Ridge sowing
- (d) Dibbling

VEGETATIVE PROPAGATION

192. The art of joining parts of plants together in such a way that they will readily unite and continue to grow as one plant is called [APPSC (FRO) 2018]

- (a) Cutting
- (b) Budding
- (c) Layering
- (d) Grafting

193. Saddle, Cleft, Veneer, Side, Bridge, Bark, Root are various kinds of methods of vegetative propagation [APPSC Forest Section Officer 2019]

- (c) Soilless culture
(d) Protected culture
- 207.** _____ are groups of plants that are identical to their one parent and can only be propagated asexually [APPSC Forest Section Officer 2019]
(a) Clones
(b) Seedlings
(c) Buds
(d) Saplings
- 208.** What is an ortet? [APPSC (FRO) 2018]
(a) A stem cutting
(b) A root cutting
(c) A group of genetically identical individuals derived from one progenitor
(d) The original single parent plant from which a clone is ultimately derived
- 209.** How many types of greenhouses are there? [APPSC (FRO) 2018]
(a) 2
(b) 3
(c) 4
(d) 5
- 210.** The Eden Project, the world's largest greenhouse project, is located in which country? [APPSC (FRO) 2018]
(a) England
(b) The Netherlands
(c) France
(d) Germany
- 211.** In greenhouses, the primary environmental parameter traditionally controlled is [APPSC (FRO) 2018]
(a) Temperature
(b) Humidity
(c) Wind
(d) Precipitation
- 212.** The greenhouse industry in the Netherlands relies heavily on glass-framed greenhouses in order to cope up with [APPSC (FRO) 2018]
(a) Cloudy conditions
(b) High precipitation
(c) High humidity
(d) Extremely low temperature
- 213.** Who designed the first modern greenhouse? [APPSC (FRO) 2018]
(a) Charles Lucien Bonaparte
(b) Russ Finch
(c) Tiberius
(d) Cardinal Lucien Bonaparte
- 214.** Orientation of single greenhouses with latitude above 40° N should have ridge running [APPSC (Forest Section Officers) 2019]
(a) North East to South West
(b) North to South
(c) North West to South East
(d) East to West
- 215.** Is a general term which applies to the growing of plants without soil in an inert medium into which nutrient solutions are usually pumped automatically at regular intervals. [APPSC (Forest Section Officers) 2019]
(a) Inorganic culture
(b) Gravel culture
(c) Organic culture
(d) Hydroponic culture
- 216.** Damping off disease in nursery seedlings is caused by [APPSC (ACF) 2022 General Forestry – I]
(a) Bacteria
(b) Virus
(c) Actinomycetes
(d) Fungi

MENTENANCE OF PLANTATION

- 217.** Ring pit is a type of pit dug out for planting, which is suitable for [APPSC (ACF) 2022]
(a) Sandy soils
(b) Loamy soils
(c) Clay soils
(d) Saline alkaline soils
- 218.** Calculate the quantity of plants required for raising 10-hectare plantation at a spacing of 2.5 m × 2.5 m. [APPSC (ACF) 2022]
(a) 20000
(b) 16000
(c) 15000
(d) 25000
- 219.** The number of plants required for 10 hectares of plantation in which the plants are planted at 2.5 × 2.5 m will be [APPSC (ACF) 2022]
(a) 32000
(b) 20000
(c) 16000

(d) 12000

220. Calculate the spacing of rows in which plants have to be 2.5 m apart and the plantation has 1000 plants per hectare [APPSC (FRO) 2022]

(a) 6 m

(b) 4 m

(c) 3.5 m

(d) 5 m

221. Calculate the spacing of rows in which plants are 2.5 m apart if the plantation has 1000 plants per hectare [APPSC (ACF) 2022 General Forestry – II]

(a) 4 m

(b) 5 m

(c) 3.5 m

(d) 6 m

222. The number of plants required for 1 ha of plantations in which plants are planted in square planting of spacing $2 \times 2 \text{ m}^2$ [APPSC (ACF) 2022 General Forestry – II]

(a) 12500

(b) 2500

(c) 1500

(d) 3000

TENDING OPERATIONS

223. Select the correct statements with respect to weed control measures in forests [APPSC (FRO) 2022]

A) Prevent the spread of weed seed by human activities, by keeping agricultural and forest machinery and objects clean.

B) Combat the spreading of weeds by using basic treatment such as ploughing, disking, tilling, etc.

C) Remove weeds by using flame and superheated steam.

D) Use any soils and sowing of any multi-crop seeds.

Options

(a) Statements A, B and D are correct

(b) Statements A, D and C are correct

(c) Statements A, B and C are correct

(d) Statements B, C and D are correct

224. Which of the following are tending operations often done in a forest? [APPSC (FRO) 2022]

A) Weeding

B) Improvement felling

C) Clear felling

D) Girdling

Options

(a) C and D

(b) A, B, and C

(c) B, C, and D

(d) A and B

225. Which of the followings is not a tending operation? [APPSC Forest Section Officer 2019]

(a) Improvement felling

(b) Pruning

(c) Regeneration felling

(d) Thinning

226. A method of thinning carried out in the irregular crop [APPSC Forest Section Officer 2019]

(a) Selection thinning

(b) No thinning

(c) Advance thinning

(d) Crown thinning

227. _____ an yield table in which parameters have been given only for one grade of thinning which is usually C' grade [APPSC Forest Section Officer 2019]

(a) Single yield table

(b) Money yield table

(c) Multiple yield table

(d) Volume yield table

228. Tending operations and maintenance of crops in a forest is carried out as per the procedure laid out in its working plan, which aims for [APPSC (FRO) 2022]

(a) Regular Yield

(b) Progressive Yield

(c) Sustained Yield

(d) Productive Yield

229. The interval in years between successive thinning are called _____ [APPSC (FRO) 2022]

(a) Thinning process

(b) Thinning intensity

(c) Free thinning

(d) Thinning cycle

ENERGY PLANTATION

230. Silvicultural biomass or high-density plantation forestry is a concept known as [APPSC (ACF) 2022]

(a) Agroforestry

(b) Farm forestry

(c) Energy plantations

- (d) Social forestry
- 231.** The Planning Commission of India has recommended which of the following species for biodiesel production? [APPSC (ACF) 2022]
- Jatropha curcas*
 - Garcinia indica*
 - Sapium sebiferum*
 - Madhuca indica*
- 232.** Which of the following plants does NOT yield bio-diesel? [APPSC (FRO) 2018]
- Simarouba glauca*
 - Pongamia pinnata*
 - Calophyllum inophyllum*
 - Xylia Xylocarpa*
- 233.** Which of the following is a second-generation biofuel feedstock? [APPSC (FRO) 2018]
- Sugarcane
 - Sugar beet
 - Corn
 - Woodchips
- MANGROVES**
- 234.** Rhizophora species are characteristic of which kind of forest type? [APPSC (FRO) 2018]
- Grassland
 - Alpine forest
 - Mangrove
 - Tropical rainforest
- 235.** The type of germination where the seed germinates inside the fruit while still attached to the parent tree is called [APPSC (ACF) 2022]
- Hypogeal
 - Epigeal
 - Vivipary
 - Advance
- 236.** _____, located in the northern Bay of Bengal, is the world's largest single patch of mangrove forests. It is spread over approximately 10,000 km² in Bangladesh and India [APPSC (FRO) 2022]
- Oceania
 - Thar
 - Sundarbans
 - Swamp of Bengal
- INDIAN TREE SPECIES**
- 237.** According to IUCN, *Pterocarpus santalinus* is considered under which of the following categories? [APPSC (ACF) 2022 General Forestry – I]
- Endangered
 - Vulnerable
 - Near Threatened
 - Least concern
- 238.** Which of the following is from the Fabaceae family? [APPSC (ACF) 2022 General Forestry – I]
- Desmodium gangeticum*
 - Bromus innermis*
 - Desmostachya bipinnata*
 - Apluda mutica*
- 239.** Which of the following tree species is classified into four broad types, namely, Hawaiian, Salvador, Peru and Cunningham? [APPSC (ACF) 2022 General Forestry – I]
- Populus deltoides*
 - Leucaena leucocephala*
 - Dalbergia sisoo*
 - Eucalyptus globulus*
- 240.** Spike disease of sandalwood (*Santalum album*) is caused by [APPSC (ACF) 2022 General Forestry – I]
- Fusarium moniliformae*
 - Fusarium oxysporum*
 - Rhizoctonia solani*
 - Phytoplasma*
- 241.** Bamboos belong to which plant family [APPSC (FRO) 2018 General Forestry Paper - I]
- Myrtaceae
 - Moraceae
 - Poaceae
 - Fabaceae
- 242.** *Eucalyptus deglupta* does not occur in [APPSC (FRO) 2018 General Forestry Paper - I]
- Australia
 - Philippines
 - Papua New Guinea
 - Indonesia
- 243.** Which tree species of India was heavily exploited during the early British period (1750- 1900) for Royal Navy ship building activities? [APPSC (FRO) 2018 General Forestry Paper - I]
- Terminalia tomentosa*
 - Dipterocarpus macrocarpus*
 - Tectona grandis*
 - Azadirachta indica*

244. The flame-of-the-forest is the common name of which of the following tree species? [APPSC (FRO) 2018 General Forestry Paper - I]
 (a) *Bombax ceiba*

- (b) *Phanerapurpurea*
- (c) *Butea monosperma*
- (d) *Lagerstroemia lanceolata*

ANSWER KEY

1. d	2. c	3. b	4. c	5. b	6. c	7. c	8. c	9. c	10. d	11. b	12. b
13. c	14. a	15. b	16. a	17. c	18. c	19. c	20. b	21. b	22. c	23. a	24. b
25. b	26. a	27. c	28. c	29. c	30. a	31. d	32. d	33. c	34. d	35. d	36. b
37. c	38. b	39. a	40. c	41. b	42. a	43. c	44. a	45. d	46. b	47. c	48. b
49. c	50. b	51. a	52. a	53. d	54. c	55. b	56. b	57. d	58. b	59. a	60. b
61. c	62. b	63. b	64. c	65. b	66. a	67. a	68. a	69. a	70.	71. d	72. d
73. a	74. b	75. a	76. b	77. b	78. a	79. b	80. a	81. a, b	82. b	83. b	84. c
85. c	86. a	87. a	88. b	89. c	90. c	91. b	92. a, d	93. b	94. b	95. a	96. d
97. a	98. c	99. c	100. c	101. d	102. d	103. b	104. a	105. b	106. a	107. c	108. b
109. c	110. d	111. c	112. c	113. c	114. b	115. d	116. c	117. b	118. a	119. c	120. a
121. a	122. b	123. d	124. c	125. b	126. c	127. b	128. c	129. b	130. d	131. c	132. c
133. b	134. b	135. d	136. d	137. a	138. c	139. c	140. b	141. b	142. b	143. a	144. c
145. b	146. c	147. d	148. c	149. b	150. c	151. a	152. a	153. c	154. c	155. c	156. b
157. c	158. d	159. b	160. a	161. c	162. a	163. b	164. d	165. c	166. c	167. c	168. c
169. b	170. a	171. a, c, d	172. d	173. d	174. a	175. a	176. d	177. d	178. b	179. c	180. c
181. a	182. d	183. c	184. a	185. a	186. c	187.	188. d	189. c	190. b	191. d	192. d
193. d	194. a	195. c	196. b	197. a	198. c	199. b	200. a	201. c	202. c	203. d	204. b
205. d	206. a	207. a	208. d	209.	210. a	211. a	212. a	213. a	214. d	215. b	216. d
217. a	218. b	219. c	220. b	221. a	222. b	223. c	224. d	225. c	226. a	227. a	228. c
229. d	230. c	231. a	232. d	233. d	234. c	235. c	236. c	237. a	238. a	239. b	240. d
241. c	242. a	243. c	244. c								

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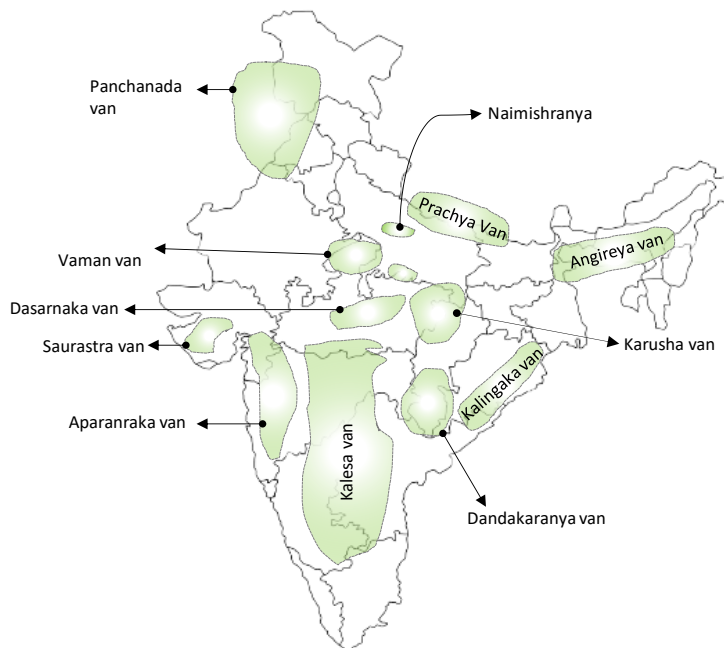
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GENERAL FORESTRY

1.1 HISTORICAL BACKGROUND

Our religious texts such as Vedas, Aranyakas (*Aranya* in *Sanskrit* means Forest), Upanishad, and Smritis contain many descriptions of the uses and management of forests and highlight sustainability as an implicit theme. According to Vedic traditions, every village would be complete only when certain categories of forest vegetation or trees (*i.e.*, *Mahavan*, *Shrivana*, and *Tapovan*) are preserved in and around its territory.



- In *Vishnu Puran* (one of the eighteen Maharanas), there is a description of 13 types of forest occurring in different parts of the country, few of them are - *Angireya Vana* (Bengal and Assam), *Prachya Vana* (Bihar, UP, Nepal), *Naimisharanya* (central UP), *Panchanada vana* (Punjab + J & K), *Aparantaka Vana* (MH), *Dandkarandya van*, *Kalinga Van*, *Saurashtra Vana*, *Kalesha van* (south of river Narmada), *Vaman vana* (near Gwalior), *Dasarnaka vana* (around Bhopal, Sagar,

Chapter Outline

- 1.1 Historical background
- 1.2 Forestry & Wildlife after independence
- 1.3 MoEFCC & Its Sub-ordinated bodies
- 1.4 Forestry Education system
- 1.5 Forest Survey of India
- 1.6 FAO & Its State of the world forest report
- 1.7 Forest types in India
- 1.8 Forest & wildlife related acts, policies & missions
- 1.9 Wildlife projects
- 1.10 National & International days & years
- 1.11 International Organizations
- 1.12 Superlatives in Forestry
- 1.13 Remarks

Mahavan : Great natural forest; Equivalent of modern-day 'Protected forest'

Shrivana : Forest of prosperity; Production forest / Planted forest for the production of fuel, fodder, Timber, etc.

Tapovan : Home of sages; Being sacred, no animal or tree could be harmed in these forests

ANDHRA PRADESH

2.1 BACKGROUND

- The “bejewelled rice bowl of India”
- Carved out of Madras state on 1st October 1953
- State reorganized : **1st November 1956**
- Reorganized (Telangana excluded) on 2nd June 2014

▶ STATE SYMBOLS

Symbol	English Name	Scientific name	Family
State Tree	Neem (Vepa chettu)	<i>Azadirachta indica</i>	Meliaceae
State animal	Blackbuck (Krishna Jinka)	<i>Antelope cervicapra</i>	Bovidae
State Bird	Rose-ringed parakeet (Rama chiluka)	<i>Psittacula krameri</i>	
State Flower	Jasmine	<i>Jasminum officinale</i>	

The emblem consists of a Purna Ghataka at the centre surrounded by a Dhramchakara in a circular form that denotes the “wheel of law,” further surrounded by the state’s name in three different languages: Telugu, English, and Hindi.

2.2 FOREST DEPARTMENT

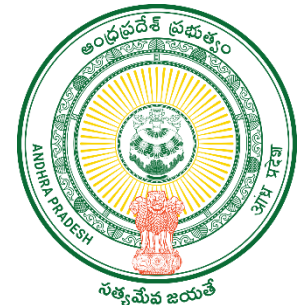
The forests referred to as "**Dandakaranya**" in the Ramayana spread over a great extent of Andhra Pradesh.

The forests of the Andhra region came under separate management in **1953** when the Andhra State was formed from the Madras State. Before 1953, the forest history of Andhra Pradesh was the same as that of Madras State.

Forest conservancy was first established in **1856** through the efforts of **Cleghorn**, and by the end of 1870, several forest blocks were demarcated. The **Madras Forest Act V of 1882** came into force on **January 1, 1883**.

Chapter Outline

- 2.1 Background
- 2.2 Forest Department
- 2.4 Forest Resources



FOREST, FORESTRY & SILVICULTURE

3.1 FOREST

The term *forest* has its roots in the early medieval European society. The increasing population and the rise of new kingdoms and serfdoms based on heavy exploitation of natural resources caused severe loss of Natural vegetation (what we call India - *Jungle*) to feed their increasing demands of food, fodder, fuel, and timber. Shrinking Natural vegetation areas creates a shortage of Fuelwood and Timber in their ruling regions, so they start separating some parts of the land, which is usually unproductive and located at the boundaries of village territory for rising tree crops that we know as *woodland* or *forest* for production of required resources

- *Forest* term derived from a *Latin**** word *foris**** which means *outside of village boundary****

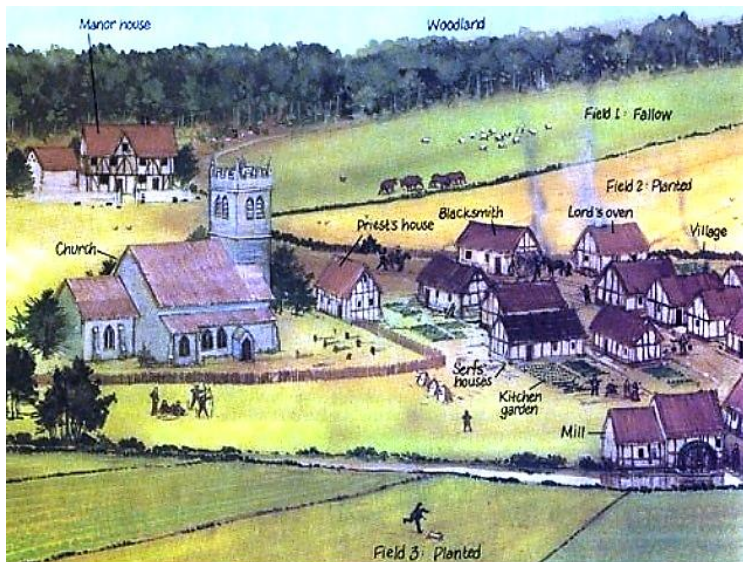


Figure 3.1 : A medieval European village

DEFINITION

- Forest is an *area set aside* for the *production of timber* and other forest produce or to get other *indirect benefits* from it [Technical definition].

Chapter Outline

- 3.1 Forest
- 3.2 Forest Classification
- 3.3 Forestry
- 3.4 Silviculture
- 3.5 Roles of forest
- 3.6 Important Terminology
 - Sacred Groves
 - Silvology
 - Precision Silviculture

CLIMATIC FACTORS

Climate is the average weather prevalent in any locality that influences our forest vegetation, *i.e.*, light, atmospheric temperature, pressure & humidity, wind, etc.

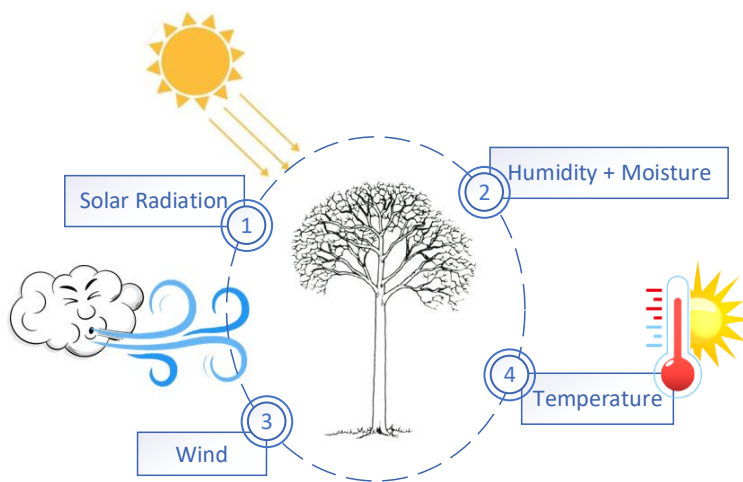


Figure 5.1 : Climatic factors

5.1 SOLAR RADIATION

Solar radiation is the primary source of energy for photosynthesis. Factors such as quality, intensity, and duration of light affect the vegetation or indirectly the entire forest ecosystem.

Related Terminology

- **Solar constant** – Energy falling in one minute on a surface area of 1 cm^2 at the outer boundary of the atmosphere. Value = $2 \text{ Cal/cm}^2/\text{minute}$
- **Photosynthetic active radiation (PAR)** : the portion of the light spectrum utilized by plants for photosynthesis, $400 \text{ nm to } 700 \text{ nm}$.
- **Radiation's interaction with the atmosphere** : (a) Absorption, (b) Reflection, (c) Scattering, etc.
- **Insolation** – the solar energy flow per unit area at the Earth's surface is called insolation

Chapter Outline

5.1 Solar radiation

- ☛ Related terminology
- ☛ Importance
- ☛ Species behaviour toward light

5.2 Temperature

- ☛ Temperature zones
- ☛ Importance of Temperature
- ☛ Effects of temperature
- ☛ Types of Frost; Frost resistance & Species behaviour
- ☛ Snow, its beneficial & harmful effects

5.3 Wind

- ☛ Beneficial & harmful effects

5.4 Moisture

- ☛ Types of precipitation
- ☛ Source of Moisture
- ☛ Importance of water
- ☛ Water-logging / Flood
- ☛ Drought
- ☛ Water tapper, Saver and Storer plants

5.5 Add-on

- Open Nutrient Cycling : In the agricultural system, once the nutrient goes down below the Rhizosphere, they usually cannot return back to the production system because farm crops do not have such a deep taproot system. So, there is a continuous leakage of nutrients from the production system.
- Close Nutrient cycling : In the forest ecosystem, the vastness of the root system at different depths makes it difficult for nutrients to leave the productive system, and often they are entirely absorbed after their decomposition process ends.
- Close and leaky Nutrient cycling : in Agroforestry system.

[Forest trees make less demand on the soil for nutrients than annual crops because a large proportion of absorbed nutrients are returned annually to the soil in leaf and fine root litter and are reabsorbed after biological breakdown of litter materials. Also, a large portion of the nutrient requirement of trees is met through internal cycling compared with agricultural crops].

6.6 INFLUENCE OF PARENT ROCK ON THE DISTRIBUTION OF TREE SPECIES

The trees draw (a) Moisture, (b) minerals & organic nutrients, (c) Oxygen, and (d) root stabilizing growing medium from the soil formed. Therefore, the parent rock affects the growth and distribution of tree species.

- In the western Himalayas, **Chir-pine** occurs mainly on **Quartzite Rocks**, while **Blue Pine** occurs on **Mica Schist**. As the Kashmir and Kulu valleys have practically no quartzite formation, Chir is conspicuous by its absence in these valleys; if quartzite occurs at higher altitudes, Chir appears there, *i.e.*, In Parbatti valley (H.P.), deodar occurs at lower altitudes on old and fresh alluvium. In contrast, Chir occurs above deodar at higher altitudes on quartzite.
- *Cupressus torulosa* occurs mainly on limestone rocks, as in the Chakrata hills of Uttarakhand.
- While **Teak** grows on **Lime-Rich Rocks**, Sal usually avoids them. Teak is absent from quartz and black cotton soil and often avoids laterite sand where found. It is usually stunted.
- **Xylia Xylocarpa** occurs gregariously in **Laterites**.

Petrology : Study of Rocks and Minerals

Edaphology : Study of soil, especially with respect to plant growth

Pedology : discipline within soil science which focuses on understanding and characterizing soil genesis, formation, distribution and potential uses of soil resources.

☞ **Cochineal insects (*Dactylopius spp.*)** cling to the outside of the host plant and (similar to how mosquitos function on people) take the plant's food and moisture out, killing it. This method is used to control the spread of **Opuntia plant**.



8.3 RELATIONSHIP BETWEEN PLANTS AND MAN

Man is one of the major factors responsible for the spread, conservation, and extinction of many useful plant species.

- Positive relationship : In-situ and ex-situ conservation and protection of plant & animal species. Regulate its distribution through afforestation and introduction of exotics in new areas.
- Negative relationship : Shifting cultivation, accidental Forest fire, illicit felling and encroachment, grazing and lopping, permanent Deforestation.

EXERCISE	
<p>1. Feeding on dead and decaying organisms is known as [MPPSC Forest Service (Main) 2019 Re-Exam]</p> <p>(a) Autotrophic (b) Holozoic (c) Saprophytic (d) Parasitic</p> <p>2. In which of the eastern States the insectivorous plant "Pitcher" is found? [MPPSC Forest Service (Main) Examination 2020]</p> <p>(a) Nagaland (b) Assam (c) Mizoram (d) Meghalaya</p> <p>Hints : <i>Nepenthes khasiana</i> is the only type of pitcher plant found in India. It is mostly found in Meghalaya. It is one of the endangered species of the country which is becoming extinct due to mining and other human activities</p> <p>3. Insectivorous plants are adaptable to [MPPSC Forest Service (Main) Examination 2021]</p> <p>(a) Dry environment (b) Cold environment (c) Environment with low nutrients (d) Environment with high nutrients</p>	<p>4. Insectivorous plants are found [MPPSC Forest Service (Main) Examination 2022]</p> <p>(a) In carbon-deficient places (b) In oxygen-deficient places (c) In phosphorus-deficient places (d) In nitrogen-deficient places</p> <p>5. In South India which insect is used to control <i>Opuntia spp.</i>, a weed, in thorn forests? [APPSC (FRO) 2022]</p> <p>(a) <i>Orthezia insignis</i> (b) <i>Cosmopterix pulchrimella</i> (c) <i>Dactylopius coccus</i> (d) <i>Estigma chinensis</i></p> <p>6. _____ is a total stem-parasite [APPSC (ACF) 2022]</p> <p>(a) <i>Viscum</i> (b) <i>Cuscuta</i> (c) <i>Loranthus</i> (d) <i>Arceuthobium</i></p> <p>7. <i>Loranthus</i> is a _____ which causes damage to forest trees [APPSC Forest Section Officer 2019]</p> <p>(a) Epiphyte (b) Weed (c) Parasite (d) Climber</p>
(1) C, (2) d, (3) c, (4) d, (5) c, (6) b, (7) c	

CHOICE OF SPECIES

In artificial regeneration, one of the most critical decisions is the selection of species. The choice of species deserves thoughtful consideration as it controls the success of artificial regeneration. A minor error in the selection of species may result in the plantation's failure, which will lead to a huge loss of money, time, and energy. Several factors need consideration in the selection of species for artificial regeneration. Essential factors to be taken under consideration in the choice of species are as follows -

- (A) Site factors = 4
- (B) Purpose of plantation? = Commercial + Envi + Social?
- (C) Silvicultural characteristics of a species.
- (D) Economic factors.

Extra Notes : Hardwood *v/s* Softwood; Indigenous *v/s* Exotics species; Fast-growing *v/s* Slow-growing species; Pure crop *v/s* Mix crop; Nurse crop & Cover crop. Controversies - Poplar, Eucalyptus, and *P. Cineraria*, etc.

16.2 FACTORS

A. SITE FACTORS

- * **Climatic factors** : Every species requires a specific environment for its growth and development and we have to choose accordingly. For sites located in hot, dry conditions like the semi-arid region of Rajasthan, we have to choose species like *Acacia*, *Albizia*, *Prosopis* (in short **AAP**, *jhaduwale* ☺). whereas, for cold deserts, we have to choose species like *Salix*, *Populus* & *Juniperus* spp. We can't interchange these species. Species were suitable for wetland afforestation (Water logging areas) : Eucalyptus, *Terminalia arjuna*, *Acacia nilotica*, etc.

Chapter Outline

- 16.2 Factors
- 16.3 Hardwood *v/s* Softwood
- 16.4 Indigenous *v/s* Exotic
- 16.5 Pure Crop *v/s* Mixed Crop
- 16.6 Cover crop *v/s* Nurse Crop
- 16.7 Fast Growing *v/s* Slow Growing Species

Mangroves form the coastal and estuarine wetland ecosystem in the tropical and subtropical regions of the world. This unique intertidal ecosystem acts as a safeguard to the coastlines from the disastrous effects of storm surges, erosion, and floods. Some mangroves occur along open coasts, subject to moderate wave processes, while most of them grow in sheltered, muddy tracts that are either regularly or occasionally immersed by tides

- **DEFINITION** : Mangroves are the diverse group of *salt-tolerant* plant communities found in the tropical and subtropical coastal and *intertidal zone* of the world, occurring mainly between latitude 24° N and 38° S.

24.1 | HABITAT

- The intertidal zone of the coastal and estuarine mudflat.
- **Diurnal tidal inundation** of marine water = loose & highly **water-saturated soil** with **High salinity** and **Anaerobic soil condition** (Lack of O₂).
- Un-availability of minerals = N P K, Fe, S, etc.
- Intense wind ← Cyclone + Tsunami.
- Average **25 - 35°C temperature** range and 100 to 300 cm rainfall.
- Rich biodiversity because of the edge effect.



Figure 22.1 : Mangroves habitat

24.2 | DISTRIBUTION

- ▶ **WORLD** : The total Mangrove cover in the world is 15 million ha which is 1% of the Tropical Forests of the World.
 - Distribution : South East Asia (About 33% of the world's Mangrove Cover) > South America (15.6 %) > North and central America (14.7 %).
- ▶ **INDIA** : **4975 km²**, which is 0.15% of the country's total geographical area.
 - **STATE/UTS-WISE** : West Bengal = 2100 km² (42.5 % of total mangroves in India) > Gujarat = 1175 km² (23.66 %) > A & N = 600 km² (12.5 %). Means, Sundarbans possess almost half of the mangroves area of India.

IMPORTANT TREE SPECIES OF ANDHRA PRADESH

Unit-VI (C) : Silviculture of the following economically important species grown in Andhra Pradesh such as – (1) *Acacia nilotica* (2) *Azadirachta indica*, (3) *Dendrocalamus strictus*, (4) *Casuarina equisetifolia*, (5) *Dalbergia sisoo*, (6) *Emblica officinalis*, (7) *Eucalyptus spp.*, (8) *Gmelina arborea*, (9) *Pterocarpus marsupium*, (10) *Pterocarpus santalinus* (11) *Santalum album* (12) *Tectona grandis*, (13) *Melia dubia* and (14) *Leucaena leucocephala*

25.1 ACACIA NILOTICA (BABOOL)

- *Syn. Acacia arabica**** = Gum arabic***
- **Family :** *Mimosaceae**** (Leguminosae).
- **Distribution :** A tree of *Semi-arid region****. Hardy to handle damages created by cracking in *black cotton soil****, drought, and moderate frost, so, widely distributed over the north Indian plains, Rajasthan, MP, MH, etc.
- **Fruit :** *Lomentum**** type
- **Phenology :** medium-size *deciduous* tree with brood shape crown
 - Leaf fall : April – May
 - Leaf renewal : May - June
 - Flowering : January to March
 - Fruiting : ripen from April to June
 - *Thorny branches.*
- **SILVICULTURAL CHARACTERISTICS**
 - Drought hardy.
 - Frost resistant
 - Light demanded
 - Good copper
 - Root suckers
- **UTILIZATION :** **Gum***** (Ladoo making), leaves **Fodder**, **Fuelwood*****, and **Timber** for farm implements. *Tannins from Bark and Pods****.



Phenology*** is the seasonal changes in the plant behaviors over a year; it is the study of when plants start flowering, fruiting, leaves shedding, etc.

25.2 AZADIRACHTA INDICA (NEEM)

- **Family :** *Meliaceae**** [Non-Leguminous = Rhizobium × = Nitrogen Fixation ×]***

- **Distribution** : Neem generally grows in tropical dry deciduous and thorn forests in drier parts up to 1500 m.
- **Phenology** : Neem is a medium size (12 – 15 m) with a broad rounded crown.
 - It is an almost evergreen tree but becomes near leafless in dry localities for a short period during February – march [*Deciduous Tree****]
 - Flowering occurs from January to March. In south India, it is in January and progressively delayed toward the north up to the Himalayan subtract where it is in 1st week of May.
 - Fruiting followed the flowering and generally ripened in June to August.
- **Silviculture characteristics** : it is a light-demander species but *sensitive to frost and fire*. However, it is drought-hardy, so it can quickly grow in the semi-arid tract of Rajasthan.
 - Coppicer well
 - Produce *root suckers*
- **Uses** : Medicinal purpose (seed oil) - Nimbicide, Nimbin, Azadirectin, etc.; *Neem coated urea****, etc.
- **Azadirachtin***** disrupts the normal function of insects. It mimics the insect molting hormone, *ecdysone*, causing disruption of the molting process. Immature insects are unable to shed their exoskeleton, preventing them from growing and eventually leading to death.



Neem pesticides kill the insect through [WII (M.Sc.) Entrance Examination (2003) Forestry]

- (a) Blocking their metamorphosis
- (b) Saponaceous action due to bitterness
- (c) It kills the insect eggs
- (d) It checks the laying down of the eggs by the insect

25.3 DENDROCALAMUS STRICTUS (MALE BAMBOO)

- ▶ **Family** : Gramineae*** (Old name Poaceae***)
- ▶ **Distribution** : The most commonly distributed bamboo of the Indian peninsula is *Dendrocalamus Strictus* or *Male Bamboo**** which is easily growing in the tropical dry deciduous locality. The culms in this bamboo are solid = having high commercial value. The other common bamboo of the Indian peninsula is *B. Arundinaria (B. bamboo)* which is often grown in moist soil, along the river beds.

Some of the important bamboo with its growing region

SN	Scientific name	Common name	Distribution
1.	<i>Arundinaria falcata</i>	Ringal***	The low-level bamboo of the <i>western Himalayas</i> ** , at elevations between 1000-2200 m. It grows gregariously, forming an undergrowth in the forests of deodar, oak, etc., usually in moist shady locations.



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Aman Patidar



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Devesh Trivedi



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Arvind Singh Thakur



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Sachin Bhondele



41

Jaikishan Sharma



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Gaurav Trivedi



43

Durgesh Jee Pandey



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Sourabh Kumar Chourasiya



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Anita Surwayamshi



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Rohit Sharma



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Pooja Baghel



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Ravikant Srivaiya



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Pushparaj Singh Sikarwar



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Shubham Kulhade



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Ashish Singh Sikarwar



58

Anupam Mishra



59

Amar Singh Bhadoriya



60

Somesh Sharma



62

Keshav Meena



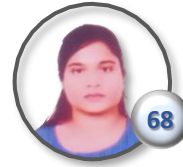
64

Sunil Singh Jadon



67

Atul Kumar Patel



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Meenakshi Suryawanshi



72

Neeraj Amb



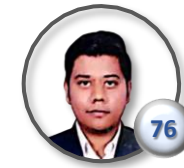
73

Rohit Nagar



74

Salil Tamarkar



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Deepak Bhadrassen



77

Kashiram Ahirwar



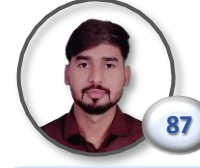
83

Jitendra Pandole



84

Abhijeet Sankla



87

Dharmendra Maida



90

Sachin Dodwe

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Yash Dhoble



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Basav Singh



Arpit



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