



Chhatrapati Shahu Ji Maharaj
University, Kanpur

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Roll No. 24062000472
Total Mark 51/75.00

Exam M.SC-III_ODD_EXAM_NOV_2025
Subject B040906T - Medicinal And Aromatic Plants (Elective)

Question wise Mark Summary

Q.No Mark Q.No Mark Q.No Mark Q.No Mark

1A	3/5	4B	0/3
1B	2/5	4C	0/3
1C	3/5	4D	0/3
1D	3/5	4E	0/3
1E	4/5	4F	0/3
1F	3/5	5	0/15
1G	3/5	6A	0/5
1H	4/5	6B	0/5
1I	3/5	6C	0/5
2	12/15	7	11/15
3A	0/3	8	0/15
3B	0/3	9A	0/7
3C	0/3	9B	0/7
3D	0/3		
3E	0/3		
3F	0/3		
4A	0/3		

**Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh**

Date of Exam: 11/12/25 Shift: III Room No.: 27
 Paper Code: 60409067 Subject: Medicinal plants Year/Sem: III
 Name of Candidate: NANCY RATHI
 Roll No.: 24062000472

Signature of Candidate: *Nancy*
 Signature of Invigilator: *Asim*
 COE Facsimile: *JK*

PART-II

MARKS OBTAINED										
Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										
Total Marks in Figures						Max. Marks				
Total Marks in Words										

Barcode
 Paper Code: 60409067
 Signature of Evaluator

Course: Master of Science (Botany)
 Session: 2025-26 Year/Semester: III
 Subject: Medicinal and Aromatic plants
 Paper Code: 60409067
 Exam Date: 11/12/2025
 Name of Candidate: NANCY RATHI
 Father's Name: GAAYA PRASAD RATHI

माहितीकरण का कोड
 College Code: K N O 4
 परीक्षा केंद्र का कोड
 Exam Centre Code: K N O 4

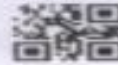
परीक्षा का प्रकार
 Type of Exam: Regular Ex-Student
 Private Back paper Exam
 ANSWER BOOKLET NO. 11623228
 Paper Code: 60409067
 Barcode

पंजीकरण संख्या
 Enrollment Number: C S J M A 24000131658
 परीक्षार्थी अंकगणना संख्या Candidate's Roll Number: 24062000472
 पेपर कोड Paper Code: 60409067

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Barcode
 Signature of Candidate: *Nancy*
 Signature of Invigilator: *Asim*
 CS Facsimile
 COE Facsimile: *JK*

नोट: 1. परीक्षार्थी को निर्दिष्ट किया जाता है कि आवेदन पत्रों को मुद्रा माप पर जाँच कर लेनी है। 2. परीक्षा में भरो जाने वाली प्रतिक्रियाएँ सही ताल से मुद्रा की जानें। 3. परीक्षा को करने का नीचे बोलचाल से भरो जायें।

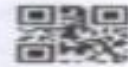


Section → B

Answer → 2

Past and present status of medicinal and aromatic plants in India

India is the country with lots of traditional knowledge. and therefore we know India has rich past regarding ~~forest~~ medicinal and aromatic plants. Medicinal plants are those plants which have bioactive molecules in them which can be extracted from them and can be used in different treatment of diseases, Aromatic plants are those plants which have secondary metabolites ^{due to} which there is aroma in them and essential oil from them can be extracted and be used in different industries eg:- pharmaceutical, cosmetics etc. And India has rich past regarding



them as Indians have been using these medicinal and aromatic since the ancient times.

Past status of Medicinal and Aromatic plants in India

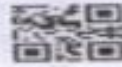
The knowledge of medicinal and aromatic plants is present in our ancient texts also they have been using these from ages. In Vedas, Upanishads, Bhagmat gita and many other ancient texts it is seen there is description of medicinal and aromatic plants that they were used and some of them were even religiously served also eg:- Holy tulsi (*Cocimum sanctum*).

In last the medicinal and aromatic plants also were exported to nearby countries from India as India was rich in them.

After the British there colonization



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stage they destructed many strengths and due to that there was decline in the medicinal and aromatic plant knowledge awareness. After the independence the government opened many institutions for promoting our traditional knowledge; so that the knowledge and usage of the medicinal and aromatic plants can be conserved.

Present status of Medicinal and Aromatic plants in India

Now the economic use of the medicinal and aromatic plants are used for economic purposes and so that many people can earn livelihood and every country can increase their economic condition by increasing GDP.

P.T.O



Industry supply and demand
Now the medicinal and aromatic
plants. Industrial demands has been
increased and it is ~~asked~~ many
industries are flourishing because
of this.

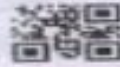
Cultivated v/s wild varieties
Now in present there are
the cultivated varieties of medicinal
and aromatic plants are common
so that there is no overexploit-
ation of the wild varieties and
also to get the quality repro-
ducibility.

Government policies and formation
of state boards for medicinal and
aromatic plants

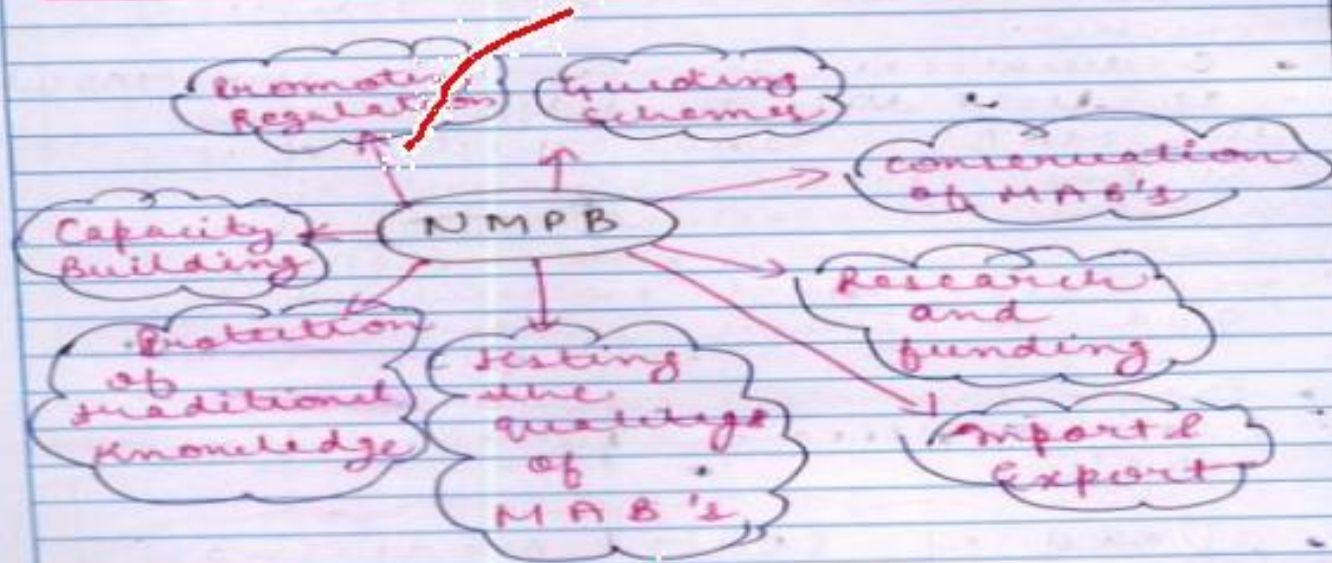
For medicinal and aromatic plants
government has formed new
policies regarding how overexploitation
should not be done and
now we should conserve natural
resources also.

For the bodies (boards)
(National Level) } NMPB } for medicinal
(State Level) } SMPB } and aromatic
plants

Do Not Write anything in this Portion



Role of National Medicinal Plant Board in promoting conservation and utilization of MAB's (Medicinal and Aromatic plants)



National Medicinal Plant Board works at National Level.

- It promotes the Regulation of MAB's across the farmers, companies,



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state consumers. so that no problems occur.

- NMPB suggest and also makes schemes regarding MAB's and also guides government regarding this.
- conservation must be done of MAB's that can be insitu. & exsitu.
- Educates the farmers regarding MAB cultivation.
- It tests the quality of the the MAB's and checks if it is has proper amount of bioactive molecules and also checks GAP good promotes good agricultural practices and good collection practices.
- It promotes research and provides research funding for MAB's.

Role of state Medicinal Plant Board

State Medicinal Plant Board performs

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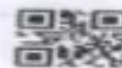


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its functions at state level-

- It sees if the policies / schemes which are made by NMPB are been applied correctly or not.
- It guides the state regarding medicinal and Aromatic plants and what kind of schemes must be followed.
- It educates and promotes the cultivation of the medicinal and aromatic plants at state level.
- It sets up laboratories to check and ensure the quality of the medicinal and aromatic plants.



Section → C

Ans → 7

Essential oil ~~can be~~ are the oil which are extracted from different parts eg:- root, flower, shoot, leaves of the Aromatic plants. Essential oil are of much importance as it is used in different industries.

there are different methods of the extraction of the essential oil depending upon what kind of essential oil you want.

Methods of essential oil extraction

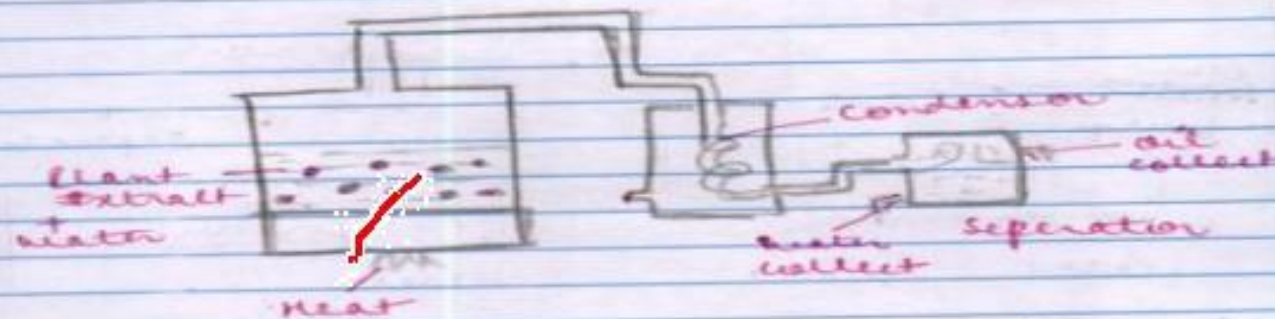
① Distillation Method

- a) water distillation
- b) steam distillation
- c) water steam distillation

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a.) Water distillation



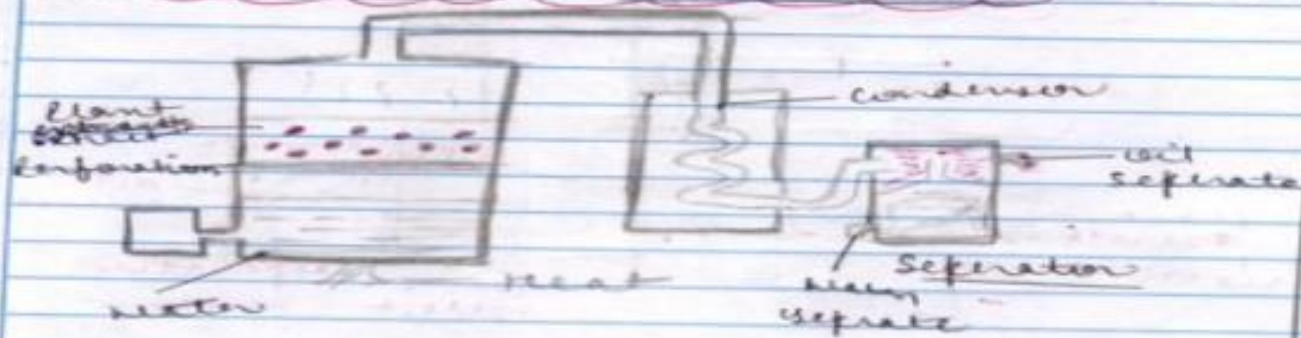
Water distillation is used for the aromatic plants which are dry. So first the plant is crushed and with water it is added in the flask after that it goes in the condenser where steam cools down and from the separator the oil is collected as oil is present above the water on the surface so it is easily collected.

b.) Steam distillation

For fresh plant, in this the plant is taken and is placed in the apparatus. And from heat the steam goes to the condenser and from condenser as it cools down the steam it turns into liquid form now the oil is collected collected from the separator.



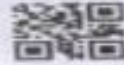
C.) Water steam distillation



In this method steam and water both are used. First the water is filled in the apparatus above that there is perforated disc and above that plant extract is placed. Now when heat is given the steam is formed which then bubbles goes through pipes goes to the condenser and oil is separated from the separator.

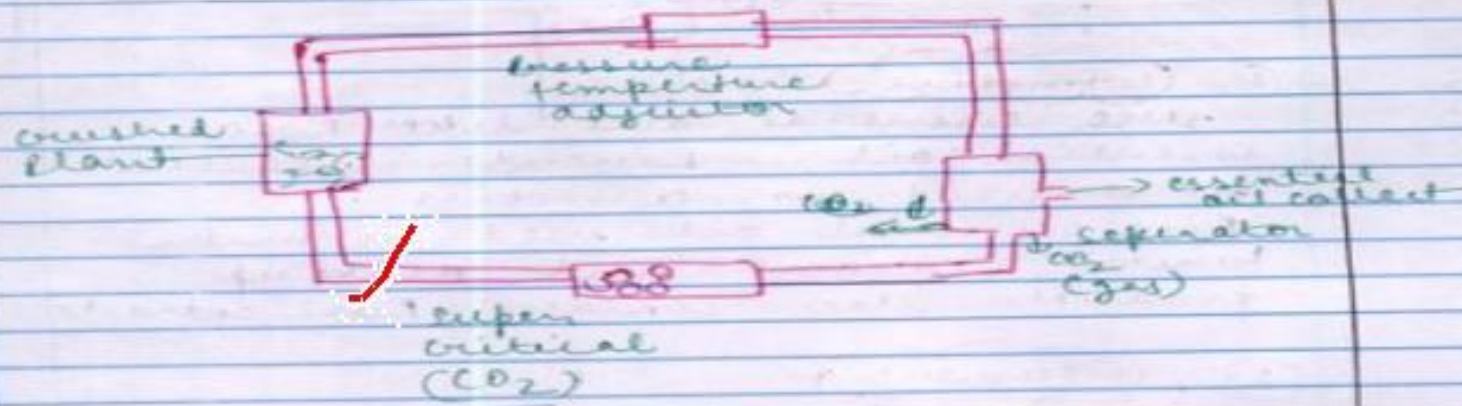
2.) Maceration

In maceration the plant is crushed and then it is kept in the alcohol for weeks and after that it is filtered by this we get the essential oil. This method is good for the plants.



where heat destroys the essential oil.

3. Supercritical fluid extraction



In this method supercritical fluid is used. In this CO_2 is used as the supercritical carbon dioxide which dissolves the plant (crushed) and after that when we lower the pressure and increase the temperature we get separate extract (essential oil) and CO_2 is in gaseous form separated. It is very good green technological supporting method.

1. Solvent extraction method

In this plant (crushed) is first dissolved in the solvent and after that by reducing pressure the solvent is separated and we get essential oil.



Industrial Applications in Cosmetics, Perfumery and Aromatherapy

1. Cosmetics

The essential oils like Rose essential oil, Lavender essential oil is used in cosmetics.

Rose essential oil used to make toner, creams and makeup products also contain Rose extracts.

2. Perfumery

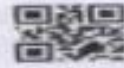
The essential oils are have very good aroma they are used as perfumery also.

eg:- Rose absolute & Rose otto are very expensive essential oil and are used in perfumery. Similarly; Lavender, Vetiver etc. their essential oils are also used in perfumery.

3. Aromatherapy

The essential oils are

Do Not Write anything in this Portion



used in Aromatherapy for that
Relaxed relaxed and Relaxation
they provide.

eg. - Lavender essential oil used
in aromatherapy as it has calming,
Anti anxiety, relaxing effects.

Section A

Q
Ans 1.

Medicinal plants

they are the plants whose
root parts eg. - Root, shoot, Bark,
stem, leaf etc. have medicinal
value which treats diseases and
are therapeutic.

Medicinal plants consists of the
bioactive molecules therefore they
have this quality.

Bioactive molecules are the secondary
metabolites which are produced
by the plant when for its
protection or any other secondary
functions.

eg. - Alkaloids, flavonoids etc.

example of medicinal plants is →



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Sloeuera, Ashwagandha, Serpgandha, etc.

Aromatic Plants

~~Aromatic~~ plants are those plants which ~~are~~ ~~vegetable~~ ~~is~~ have characteristic fragrance and whose essential oil can be extracted. There are many uses of the essential oils in pharmaceutical, cosmetic industry, ~~cosmo~~ perfumery and aroma therapy.

They have certain secondary metabolites due to which this essential oil can be formed.

Example of aromatic plants

→ ~~Saunders~~, Rose, Vetiver etc.

Do Not Write anything in this Portion



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Section Part B

National Medicinal Plant Board is the Board that works on National level, for the major initiatives taken by National Medicinal Plant Board are:-

- conservation of the medicinal and aromatic plants inside or outside.
- a very helpful in tests the quality of the medicinal and plant board and it is said 'By National Medicinal Plant Board to follow good agricultural practices and good collection process practices. the overexploitation of the medicinal and aromatic plants should not be done. sustainable use of them should be done. the research protection of the traditional knowledge so that the traditional knowledge could not be exploited.'



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Ans C

Sarpagandha also known as
Andiaera scientifically ~~Waddiana~~

Sarpagandha's scientific name is
Rauwolfia serpentina.

Sarpagandha is one of the most
popular medicinal plant.

It has bioactive molecules like
alkaloids, flavonoids, alkaloid.

Sarpagandha is known for hairy
roots like snake and it
it is also called as Sau

Sarpagandha because (from
ancient ~~type~~ time) because

as its roots smells like snake
therefore its name is Sarpagandha.

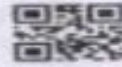
Sarpagandha is anxiolytic, Neuro-
protective, Antioxidant and also
Sati

Therapeutic use of Sarpagandha

Sarpagandha is used to treat
Epilepsy seizures.

In ancient times it was also used
for snake bites (treatment)

Do Not Write anything in this Portion



Answer D

Bioactive molecules are the secondary metabolites present in the plant which do not have any direct primary role in main function of plant but these are equally important as it helps the plant to camouflage, provides protection to the plant, helps the plant to attract pollinators etc.

Example:

• Safed Musli (Medicinal plant)

↳ scientific name

↳ Chlorophytum borivilianum

The bioactive molecules present in Safed Musli are:

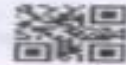
→ Saponins → due to saponins the Safed Musli has its characteristic aphrodisiac property.

→ flavonoids → due to this bioactive molecule it is antioxidant.

→ Glycomans & Polysaccharides
due to this bioactive molecule Safed Musli provides lots of energy.



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Ans E

Kalmegh (Andrographis pinaculata)

the two medicinal uses of Kalmegh are:-

I.) Antipyretic

Kalmegh is used for the fever reduction. it can be used on any type of fever it is very helpful in reducing fever.

II.) Anti microbial

As we know that Kalmegh has a bitter taste therefore and has some qualities like neem therefore it is used as anti microbial and used to treat different microbes (bacteria, virus etc)

Ashwagandha

PTO

Do Not Write anything in this Portion



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Ashwagandha (Withania somnifera)

The two medicinal uses of Ashwagandha are:-

i) Anti-inflammatory and antiarthritic. The Ashwagandha is used for the reduction of inflammation and also helps (benefits) in rheumatoid arthritis.

ii) Immunity modulatory. Ashwagandha helps to modulate the immunity and helps to increase the immunity.

iii) Neuroprotective. Ashwagandha protects the neural cells and helps in the healthy functioning of brain.

Turnover
for next
answer

PTO.



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Answer F

Also Nutraaceuticals are the plants which are food but also have medicinal value also. The ~~nutraaceuticals~~ are also tested ~~as to~~ and experiments are done in lab so that the net medicinal value of the food ~~for~~ / vegetable / fruit can be increased.

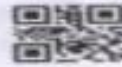
Nutraaceuticals are very good as because by we eat them daily and only just by eating them (as it they have high net medicinal value) we have also can attain also boost our immunity. Many disease are not caused because of this. ~~side~~

Example ~~of~~ ~~nutraaceutical~~ medicinal foods are:-
Garlic, turmeric, fish (has omega 3) ~~and~~
maximalis.

Do Not Write anything in this Portion



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Answer 9

Aromatic plants are the plants which have essential oil which can be extracted. The aromatic plants produce fragrant fragrance which makes them different from other plants. The four aromatic plants are as follows.

- Rose

Rose is the aromatic plant as it has distinct fragrance. The rose produces rose essential oil. The rose absolute and rose otto are famous.

- vetiver / Khair-Khair

Vetiver is also the aromatic plant with earthy smell. It helps to relax. The vetiver produces vetiver essential oil.

- Eucalyptus

Eucalyptus is also the aromatic plant which produces the eucalyptus essential oil. and it helps in repelling the insects.

- Peppermint

It produces the peppermint essential oil. which has very cool after effect.

Do Not Write anything in this Portion



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Ans 11

Essential oils are the extracts made from ~~the~~ ~~from~~ which we take out from different methods from Aromatic plants. Essential oils are very beneficial as it can be used in perfumes, cosmetics, aromatherapy etc. there are many methods of the extraction of the essential oil.

The 2 methods of extraction of essential oil are:-

i) Maceration

In this plant is crushed and dissolved in the alcohol kept there for few weeks after that the ~~also~~ it is filtered and we get our essential oil.

ii) Steam water distillation

In this ~~plant~~ ^{crushed} is kept in the apparatus with water and by steam is formed and by passing through condenser ~~also~~ the essential oil is separated.



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Ans I

Bioprospecting is the search for the commercialization of the product from the nature.

It is a bio-prospecting we can get to know different products which from the nature which can be useful.

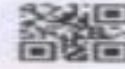
Bioprospecting is different from Biopiracy as in Biopiracy there is illegal access use or accumulation of the traditional knowledge or any other's information and then patent that knowledge by your name. eg:- Neem case, Re Basmati rice case, turmeric case. Where traditional knowledge of India was taken used and patented by US & foreign companies so this is Biopiracy.

Bioprospecting does not steal any one's knowledge like Biopiracy. In Bioprospecting we are simply going to nature searching for the product which

P.T.O



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can be useful for the human welfare and then commercializing it.

Do Not Write anything in this Portion

