Chhatrapati Shahu Ji Maharaj
University, Kanpur

Answer Script Details
Barcode 10126265

Roll No. 25088000033
Total Mark 38/50.00

Exam M.SC IN AGRICULTURE HORTICULTURE MSCAG_ODI
Subject HORT5001 - PROPAGATION AND NURSERY MANAGE

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	4/5						
1B	4/5						
1C	4/5						
1D	4/5						
1E	3/5						
1F	4/5						
2	0/10						
3	8/10						
4	0/10						
5	0/10						
6	7/10						
7	0/10						
8	0/10						
9	0/10						

PART-II

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

Date of Exam: 28/1/25 Shift: 1st Room No.: LT-4
Paper Code: HORT-5001 Subject: PNMFC Year/Sem: 1st Sem
Name of Candidate: MOH ASIF
Roll No. 2508800033

Signature of Candidate | Signature of Invigilator | COE Facsimile

MARKS OBTAINED

Q.	1	2	3	4	5	6	7	8	9	10
(a)										
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Total										

Total Marks in Figures | Max. Marks
Total Marks in Words

HORT5001
Paper Code

Signature of Evaluator

PART-III

Course M.Sc (Ag) (Horticulture)
Session 2024-25 Year/Semester 1st Sem.
Subject Propagation & Nursery Mgt. for Fruit Crops

Paper Code: H O R T 5 0 0 1

Exam Date: 2 8 0 1 2 0 2 5

Name of Candidate: MOH ASIF

Father's Name: MD RASHID

महाविद्यालय का कोड College Code: EW02

परीक्षा केन्द्र का कोड Exam Centre Code: EW02

परीक्षा का प्रकार Type of Exam
- संस्थागत Regular ●
- भूतपूर्व परीक्षार्थी Ex. Student ○
- व्यक्तिगत Private ○
- बैक पेपर परीक्षा Back paper Exam ○

ANSWER BOOKLET NO.

10126265

HORT5001
Paper Code

PART-IV

नामांकन संख्या Enrollment Number: CSJMA20013255 49

परीक्षार्थी अनुक्रमांक संख्या Candidate's Roll Number: 2508800033

पेपर कोड Paper Code: HORT5001

Signature of Candidate

Signature of Invigilator

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नोट : 1. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पन्ने के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. गोलों में भरी जाने वाली प्रविष्टियाँ बायीं तरफ से शुरू की जायें। 3. गोलों को काले या नीले बॉलपेन से भरा जायें।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below blacken the circles completely.

4. Make no Stray marks on this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

परीक्षार्थी के लिए निर्देश

1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र कोड सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में (1–24) से कम है या फटे हुए है, तो परीक्षा शुरू होने के पूर्व दूसरी उ पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्र में कोई त्रुटि है तो उसके परीक्षा शुरू होने के 30 मिनट के अन्दर निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा व कार्यवाही नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. B कोपी या अतिरिक्त ग्राफ नहीं दिया जायेगा।

IN ORDER TO AVOID UFM (UNFAIR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/ electronic watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

INSTRUCTIONS TO THE CANDIDATE

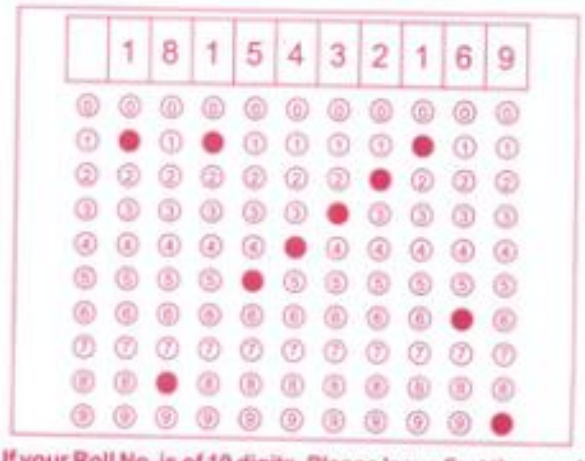
1. Read the instructions carefully given on the Question Pap Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-32) or any other kind of damag in your answer script, if found than change the answer scri immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e. Subject Code, Subject Name and Question of the Questi Paper during first THIRTY MINUTES of the commencement the exam, so that it can be corrected in TIME. After that n corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over pape should fill in status as Carry Over. Those appearing as E Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

अनुचित साधन से बचने हेतु:

1. उत्तर पुस्तिका के निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखें तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़े, मोबाईल, डिजिटल डायरी, कोपी, पुस्तक यह सभी वस्तुए जो अनुचित साधन के अन्तर्गत आती है। केवल संबंधित प्रश्नपत्र में ही मेमोरी लैस साइंटफिक केल्कुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में रबपे न रखें न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numberals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.



Note - If your Roll No. is of 10 digits. Please leave first three columns

Paper Code: HORTS001

01

Section - 1

Ans of Qus. 1 (A)

Polyembryony - Formation of multiple embryos within a single seed is called Polyembryony.

The term 'Polyembryony' was coined by Brown (1859) and it was first discovered by Leeuwenhoek (1719) in Citrus aurantium (Sour lemon/Sour orange).

Examples: Polyembryony is commonly found in Mango (Dilsar, Bappakai, Chandrakiran, Goa, Pinkpa varieties), Citrus & Jamun etc.

Types of Polyembryony - There are two types Polyembryony

1. True Polyembryony: When multiple embryos developed within one by budding into single embryosac is termed as True Polyembryony. It is further divided into 2 groups.

a. Cleavage Polyembryony - Formation of multiple embryos within embryosac either from cleavage of egg or synergids antipodals or from embryosac. eg Coconut.

b. Nucellar Polyembryony / Adventitious - Formation of multiple embryos from tissues living outside embryosac. eg Mango, Citrus

2. False Polyembryony - Development of multiple embryos due to developed apospatic embryosac.

Paper Code

Advantages of Polyembryony —

1. Smaller embryos appeared to be weak free disease free.
2. Help in propagation of Page & citrus
3. Development of homozygous diploid.
4. Artificial production of embryos
5. Genetically identical offspring.

Ans of Q.8.1.C.)

Dormancy — Dormancy is the condition when mature seeds will not germinate even when climatic conditions such as Temp., rainfall, Wind, Humidity etc are favorable for germination.

Dormant period of seed is the period between maturity & the time when seed finally germinate.

Eg Apple, Pear, Peach will not germinate under favorable climatic conditions.

Types of Dormancy — Two types

1. Exogenous dormancy: This type of dormancy is caused by external factor affecting the embryo. It hinders the germination through various means including inhibiting the water uptake, provide mechanical

resistance for embryo expansion, preventing the leaching of inhibitors of embryo.

2. Endogenous dormancy: This type dormancy is imposed by underdeveloped or immature embryo at the time of ripening or maturity. Due to underdeveloped embryo at the time of seed disposal the seed do not germinate immediately after harvesting.

Methods of breaking dormancy -

1. Scarification: Process of breaking, scratching, mechanical abrasion of seed coat through various means such as mechanical treatment, Acid treatment, Hot water treatment to make seed coat permeable for water & gases.

2. Stratification — Exposing the seed at low temp. (0-5°C) for 1-6 months depending on type of seed is called stratification.

3. Chemical treatment — Thiourea (0.25-5%), KNO_3 (0.2%), Sodium hypochlorite are used to break dormancy.

Advantages of Dormancy —

1. Dormancy permitting germination only in favorable condition
2. Help in 'Seed bank'
3. Facilitate in seed germination synchronize at specific time of year
4. Facilitate seed dispersal.

Paper Code

04

Ans of Qus 1(c)

Sexual propagation — Multiplication of plants by seed is called sexual propagation. In this Miosis division takes place & chromosome numbers reduced to half which becomes normal after fertilization.

Sexual propagation involves union of Pollen (male) with Egg (female organ) in plants to produce seeds. Plants raised through seeds are called 'Seedlings'.

Advantage of sexual propagation —

1. Essential method in Papaya, Coconut for propagation.
2. Easy & less expensive.
3. No risk of failure
4. Evolution of new varieties
5. Importance of Polyembryony.
6. Availability of clonal seedling of Lucknow 49 (Sardar) from 'Allahabad safeda' is done by Dr. G.S. Cheema
7. Long life span
8. More yield & vigorous plant.

Disadvantages of sexual propagation —

1. Variation in Parental character.
2. High maintenance due to vigorous growth
3. Seedless fruit can not be propagate
4. Prolonged juvenility stage
5. Extension of disease spore.
6. No assurance of genetic identically plants.

Paper Code HORTS001 05

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Ans of Ques 1(D)

Rootstock — Rootstock refers the lower part of a grafting combination which develops into root system of complete plant.

Intermediate stock — Interstock is a piece of stem inserted by the means of two graft union between rootstock & scion to avoid graft incompatibility.

Characteristic of good rootstock —

1. Rootstock should have good establishment ability with deep roots in soil.
2. Rootstock should resistant against disease & insects.
3. Rootstock should have ability to grow in adverse climatic conditions.
4. Rootstock should resistance against Frost, Salinity, Alkalinity & acidity of soil.
5. Rootstock suitable for different soils & climates.
6. Rootstock should of Dwarf habit.
7. Rootstock should be propagate through easy propagation methods.

Important rootstocks —

1. Apple — M-9, M-B, M-27, M-16, M-25
2. Sapota — Rayan or Khirni
3. Citrus — Rangpurlime, Cleopatra, Jatti khatti, C. jambhiri
4. Mango — Kurkan, Bappakkai
5. Guava — Pusa srijan.

Paper Code

06

Ans. of Qus 1 (E)

Meristem culture — Meristem culture is the technique of micropropagation in which meristematic dome or a few (1 or 2) subtending leaf primordia are placed in suitable artificial growing media with proper nutrient & in aseptic condition. After some weeks an elongated rooted plant developed which transferred to soil when attain a considerable height.

Advantages —

1. Disease free plants seen from infected plants.
2. Rapid rate of multiplication.
3. Clonally & genetically identical cells in huge number
4. A miniature part can regenerate a whole new individual

Disadvantages —

1. Require technical & trained labour.
2. Higher cost
3. Slight infection damage entire lots of plants.

Paper Code: HORTS001

07

Ans. of Q8 1(E)

PGR — PGR are those chemicals which occurs naturally or applied artificially in plants inhibit or stimulate the growth of plants.

Role of PGR in Rooting of cuttings —

1. Auxin — 1934 मे Auxin की खोज के बाद यह ज्ञात हुआ कि पौधे मे उपस्थित प्राकृतिक Auxin (IAA) और कृत्रिम Auxin (NAA) पौधो मे अन्य क्रियाओ के साथ मूलन को भी प्रभावित करता है। कृत्रिम Auxin IBA तथा NAA की व्यावसायिक आपूर्ति है 2-4 दिन मे जड़े निकल आती है।

2. G.A — यह मूलन को अधिकतर ... से प्रभावित करता है। पौधो मे G.A की मात्रा ... होने पर यह पुरानी कोशिकाओ मे विभाजन उत्पन्न कर देता है और मूलन पर प्रतिकूल प्रभाव डालता है।

3. Cytokinin — यह Bimodal के निर्माण मे सहायक होता है। इसकी मात्रा अधिक होने पर पत्तियो तथा ... का निर्माण अधिक होता है।

4. Ethylene — यह जैविक हार्मोन है जिसकी अधिकता मे मूलन कम व कमी मे मूलन अधिक होता है।

Paper Code

08

Section – B

Ans of Qus 3

Seed dormancy — Dormancy is the condition when mature seeds will not germinate even when climatic conditions such as Rainfall, Temp, Humidity are favourable for germination.

The dormant period of seed is the period between maturity & the time when seed finally germinate.

Rest period — The time during which mature seed will not germinate under favourable climatic condition but retains their viability & perhaps germinate at some future dates.

Causes of Seed dormancy —

1. Impermeable to water uptake: Seed coat become hard & fibrous during drying & ripening as a result seed coat become impermeable to take water & gases which prevent physiological process necessary for germination.

In some seed the embryo can absorb water & gases but hard outer layer make difficult to germination.

2. Chemical presence — When certain chemicals as Phenolic acid, coumarine, Abscisic acid remains in fruit & seed covering often harvesting they inhibit the germination process. This is most common in fleshy fruits specially in juicy fruits. Eg. Citrus, Tomato, Grapes.

3. Morphology of seeds — When the embryo of seed remain underdeveloped or rudimentary or lower it leads to seed dormancy. When such type seeds are dispersed they do not germinate. Eg. Ranunculaceae & Papaveraceae family

4. Photo dormancy — Seeds require light or darkness for germination.

a. Light stimulate germination: Tobacco, Sunflower
b. Light adversely affect germination: Onion, Amaranthus, Datura
c. Light neutral seeds: Seeds of fruits & vegetables

5. Thermodormancy — Some seeds require specific temp for germination. otherwise they remain dormant.
Eg. Tomato

Minimum temp - 10°C
Optimum temp - 29.5°C
Maximum temp - 35°C

6. Secondary / Induced / Forced — Dormancy due to unfavourable light & temp., prolonged darkness & water stress leads to dormancy.

Paper Code

Methods of Breaking dormancy —

1. Scarification — Scarification refers breaking, scratching, or mechanical altering of seed coat to make it permeable for water & gases. It has 3 methods.

a. Mechanical scarification — Rubbing seeds with sand, cut seed coat with knife, nick seed coat with hammer.

b. Acid scarification — Treat the seeds with concentrated H_2SO_4 & HCl with 1 part seed & 100 part acid for 10 min to 6 hrs.

c. Hot water scarification — Soaking the seed in hot water which has 4-5 times greater volume than seeds at temp of 77-110°C.

2. Stratification — Exposing seeds at low temp (0-5°) for 1 month to 6 months. which helps in ripening process after ripening & break dormancy. Seeds are placed in wooden sand box with moist condition.

3. Hormones — Among hormones GA is commercially used to break dormancy with the concentration of 200-500 ppm.

4. Chemicals — Thiourea, KNO_3, Sodium hypochlorite are used to break dormancy.

Section - C

Ans. of Qu - 6

Micropropagation — M.P refers multiplication of plants in aseptic condition, controlled atmosphere, in artificially growing media from very small plant parts like meristemic tip, embryo, anther, pollen, cells etc. It is also called Tissue culture or Invitro culture.

German Plant physiologist Haberlandt (1902) first describe the biological principles of tissue culture.

In India P Maheshwari (Delhi) and Ankur are known as Father of Micropropagation.

Advantages —

1. Rapid rate of multiplication of plants clonally in large numbers
2. Diseased free plant.
3. A miniature plant part can regenerate new individual.
4. Development of Haploids.
5. Induced mutation.

Disadvantages —

1. Tissue culture require trained, skilled & special techniques.
2. High cost due to maintenance in lab.
3. Slight infection damage entire lot of plants
4. Poor establishment in field.

Principles & concepts of M.P —

Paper Code

1. Totipotency — Ability of living cell to express all of its genes to regenerate new individual.

2. Auxiliary bud proliferation — It stimulate the auxiliary bud to grow in short to regenerate new plant.

3. Organogenesis — Process of morphogenesis which involved with development of ~~embryo~~ organs as shoot, shoot, leaf from explant.

4. Embryogenesis — Process of regeneration of embryo from somatic cells, tissue or organ. It is also called asexual embryogenesis.

Different culture techniques —

1. Callus culture — Callus is mass of undifferentiated parenchymatic cells. When a living plant tissue placed in suitable culture media under favourable condition callus is formed. Transfer the callus in the media containing PGR for next induction.

2. Embryo culture — Embryo is excised & placed in artificial growing media, with aseptic condition. After some time when embryo developed into plantlet transfer it to the soil. It is necessary in interspecific &

intergeneric hybrids for embryo abortion prevent.

Anther culture — It is used to produce haploids from anther containing microspores.

Cell culture — A cell or group of cells dispersed and grown in an aerated liquid medium.

Stages of M.P — 5

Stage 0 — Selection of mother plant & grow up to 3 months.
Stage I — Establishment of culture (embryo, anther etc) in suitable culture media
Stage II — Multiplication of shoot or Rapid somatic embryo formation
Stage III — In vitro germination of somatic embryo
Stage IV — Transferred into green house for hardening

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X

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18

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