

M.Sc.(Ag.) Examination, 2016
Semester – I
Horticulture
Course No. HOR-501
(Growth and Development of Fruit, Vegetable and Ornamental Crops)

Time: Three Hours

Full Marks: 50

Questions are of value as indicated in the margin
Answer **any five** questions

1. Write short notes on any **five (5)** of the following: 2.0 x 5 = 10
 - a) Salt tolerant crops
 - b) Aquaporin
 - c) Allometry
 - d) Management of drought
 - e) Photoblastic seed
 - f) Double fertilization
 - g) Importance of seed dormancy
 - h) Dry matter partitioning
 - i) Oxidative stress
 2. Differentiate between any **four (4)** of the following pairs: 2.5 x 4 = 10
 - a) Growth and Development
 - b) Auxins and Gibberellins
 - c) Contrivances for Self pollination and Cross pollination
 - d) Symplast and Apoplast
 - e) Salinity and Alkalinity
 - f) Senescence and Abscission
 3. Discuss in brief about crop growth analysis? Write in brief about different laws of growth? 5 + 5 = 10
 4. What is drought? How is it different from physiological drought? Describe various effects of salt stress on plants. How do the plants adapt to salinity stress? 1 + 4 + 5 = 10
 5. a) What is Mengel's classification of mineral elements? Discuss in brief about physiological roles and deficiency symptoms of Nitrogen, Phosphorus, Boron and Zinc in crop plants.
(b) What is Hydroponics? Discuss in brief about advantages and disadvantages of Hydroponics. 2 + 3 + 2 + 3 = 10
 6. Discuss in brief about different physiological roles of different plant growth regulators? Discuss in brief about their application for chemical manipulation of horticultural crops. 7 + 3 = 10
 7. Answer any **two (2)** of the following within 150 words. 5.0 x 2 = 10
 - (a) What is morphogenesis? Discuss the role of light and photoperiodism on flowering.
 - (b) Write in brief about physiological and biochemical changes during ripening of fruits?
 - (c) What is apical dominance? Discuss in brief about the impact of training and pruning on growth and development of horticultural crops?
 - (d) Write the flowchart of adaptation of plants to drought?
 8. Answer any **two (2)** of the following within 150 words. 5.0 x 2 = 10
 - (a) Write in brief about novel plant growth regulators like Strigolactone and Karrikins.
 - (b) Discuss in brief about flowering and sex expression in horticultural crops.
 - (c) Write in brief about molecular and genetic approaches in manipulation of growth and development of horticultural crops.
 - (d) What is parthenocarpy ? Discuss in brief about different types of parthenocarpic fruit development.
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M.Sc.(Ag.) Examination, 2016
Semester – I
Horticulture
Course No. HOR-502
(Fundamentals of Fruit, Vegetable and Ornamental Crops)

Time: Three Hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. Enumerate the role of horticulture in Indian economical growth. Describe the various agro-climatic regions with suitable example of horticultural crops under them. 5+5=10
 2. Briefly explain the nursery management techniques for growing horticultural crops. Classify various training and pruning methods applied to fruit crops. What are the selection criteria of rootstocks? 4+3+3=10
 3. Classify fruit crops in brief with examples. Explain the various factors related to orchard development with suitable example. 3+7=10
 4. Explain present trend of modern floriculture in India. Mention the importance of flower cultivation and landscape gardening. 4+ (3+3)=10
 5. Describe the importance of vegetables for daily nutritional requirement. Make a brief note on different kind of vegetables with suitable examples. Explain the most relevant constraints for low yield of vegetables in India. 3+4+3 = 10
 6. Briefly describe different styles of gardening. Write down the features and components of Japanese garden. 6+4 = 10
 7. What do you mean by herbaceous boarder? What are the principles and methods of making herbaceous boarder? Make a brief note on hedge. 2+4 +4 = 10
 8. Write short notes on **any five** of the following topics: 2 x 5 = 10
 - a) T-budding
 - b) Veneer grafting
 - c) Rock garden
 - d) Bonsai
 - e) Floor management of orchard
 - f) Avenue plantation
 - g) Kitchen garden
 - h) Lawn management
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M. Sc. (Ag.) Examination, 2016
Semester – III
Horticulture
Course No. HOR-504
(Post Harvest Technology of Fruit, Vegetable and Ornamental Crops)

Time: Three Hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. What do you mean by sorting and grading? What are the benefits of sorting and grading? State post-harvest handling of mango with a flow chart. 3+2+5=10
 2. Enumerate the characteristic physical, biochemical and physiological changes during ripening of fleshy fruits with particular emphasis on changes in carbohydrates. State the differences in climacteric and non-climacteric fruits. 8+2=10
 3. Discuss postharvest handling of cut flower with a flow chart. Write in brief about maturity indices, preservative solution, causes of stem plugging of cut flowers. 4+6=10
 4. Write in brief: (**any five**) 5 x 2 = 10
 - a) Marketing channels of fruits prevailing in India
 - b) Cool chain management of flowers
 - c) Waxing of fruit and vegetables
 - d) Causes of spoilage of processed foods
 - e) Cooling of fruits and vegetables
 - f) KMnO_4
 - g) Pulsing
 5.
 - a) Classify fruit juice beverages.
 - b) Discuss preparation and preservation of any fruit beverage emphasizing selection of fruits, machineries used for extraction of juice, heat treatment and probable types of spoilage3+2+2+2+1=10
 6. Define jelly and marmalade. Write in brief about preparation of jelly with special reference to selection of fruits, extraction of pectin, test of pectin, mixing of sugar, end point determination and recipe. Enumerate defects of jelly. 2+5+3=10
 7. What do you mean by canning and appertization. Discuss canning of vegetables through a flow chart mentioning temperature regime at different steps. Discuss microbiological spoilage of canned products. 3+5+2=10
 8. State the principles of storage of fruits and vegetables. Classify different low cost storage structures on the basis of operational principle. State the differences between CA and MA storage. 3+4+3=10
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M. Sc. (Ag.) Examination, 2016
Semester – I
Horticulture
Course No. HOR-511
(Propagation and Nursery Management in Horticultural Crops)

Time: Three hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. How does cutting differ from layering? What are the physiological basis of root formation in cutting? Discuss the different methods of stem cutting. 2+3+5=10
2. Define graft incompatibility. What are the symptoms of graft incompatibility? Describe the types of graft incompatibility. Write in brief about the physiological and anatomical causes of graft incompatibility. 1+3+3+3=10
3. Define dormancy. What are the different types of dormancy? What are the different means of overcoming dormancy? Mention the advantages and disadvantages of dormancy. 1+3+4+2=10
4. Write down about the different propagation structures with special reference to mist chamber, cold frame, hot beds, lath house and net house. 5 x 2 = 10
5. Define apomixis and polyembryony. What is their significance? State different types of apomixis and polyembryony. Write the merits of seed propagation. 2+2+4+2=10
6. What do you mean by nursery? What are the different types of nurseries? Mention different nursery techniques followed in horticultural crops. Write in brief about the significance of nursery for fruit cultivation. 1+2+5+2=10
7. Distinguish between (**any four**): 2.5 x 4=10

a) Attached and detached grafting	e) Chimera and bud sport
b) Runner and stolon	f) Orthodox and recalcitrant seeds
c) Growth regulator and retardants	g) Corm and rhizome
d) Patch budding and shield budding	
8. Write short notes on (**any four**): 2.5 x 4=10

a) Micro propagation	e) Rejuvenation
b) Seed viability	f) Top working
c) Green house	g) Stone grafting
d) Rooting media	

Horticulture
Course No. HOR-512
(Tropical and Dry Land Fruit Production)

Time: Three hours

Full Marks: 50

Questions are of value as indicated in the margin
Answer **any five** questions

1. Briefly describe the important hybrids, maturity standards and major problems of mango cultivation in India and suggest suitable measures to overcome them. 2+3+5=10
 2. Discuss on production technology of ber with particular reference to soil & climatic requirements, irrigation & intercultural operations and maturity indices & harvesting. 10
 3. What are annonas? Describe in brief about soil and climatic requirement, commercial varieties, propagation methods and flowering behaviour of custard apple. 2+2+2+2+2=10
 4. Discuss in brief about varieties, flowering behaviour, soil and climatic requirements and training and pruning of pomegranate. 2+2+3+3 = 10
 5. Write in brief about cultivation of citrus with special reference to: 2.5x4=10
 - a) Classification of citrus on the basis of fruit
 - b) Rootstocks and propagation
 - c) Nutrient and water management
 - d) Maturity and harvesting of mandarin
 6. Discuss on the production technology of pineapple with reference to: 2.5x4=10
 - a) Soil and climatic requirement
 - b) Varieties and planting
 - c) Flower induction and staggering of harvesting
 - d) Physiological disorders
 7. Explain in detail, one of the most important problems of the following fruits crops and strategies for their management 2.5x4=10
 - a) Banana **or** custard apple
 - b) Citrus **or** aonla
 - c) Fig **or** papaya
 - d) Jackfruit **or** guava
 8. Write short notes on the following (**any four**) : 2.5x4=10
 - a) Training & pruning in ber
 - b) Bahar treatment in guava
 - c) Nutritional properties of monkey jack.
 - d) Propagation and varieties of date palm
 - e) Varieties of bael
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M.Sc. (Ag.) Examination, 2016
Semester-III
Horticulture
Course: HOR-516
(Canopy Management in Fruit Crops)

Time: Three Hours

Full Marks: 50

Questions are of value as indicated in the margin
Answer **any five** questions

1. Write down the principles of canopy management. Discuss on environmental factors affecting canopy management of fruit crops. 5+5=10
 2. Discuss briefly the importance of rootstocks for better management of canopy of temperate fruit crops. 10
 3. Discuss on canopy management techniques followed in mango or grapes with special reference to training & pruning, varieties and uses of growth regulators. 5+5=10
 4. Discuss on canopy management practices by adopting training and pruning for improving flowering and fruiting in guava and ber. 5+5=10
 5. Enumerate briefly the role of plant growth regulators and pruning on canopy management of fruit crops. How do growth regulators and pruning affect the flowering and bearing of fruits? 6+4=10
 6. Why is quality of light considered as one of the important factors for successful fruit production? How we can manage the proper interception of light throughout the plant canopy? 6+4= 10
 7. Discuss canopy management techniques followed in litchi with special reference to training and pruning; varieties and uses of growth regulators. 10
 8. Write short notes (**any two**) : 5 x 2 = 10
 - a) Canopy management in high density planting
 - b) Rejuvenation
 - c) Topping and skurfing
 - d) Types of pruning
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M.Sc.(Ag.) Examination, 2016
Semester – I
Horticulture
Course No. HOR-522
(Production Technology of Warm Season Vegetable Crops)

Time: Three hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. a) Discuss in brief about taxonomy of tomato
b) Distinguish between determinate and indeterminate type of tomato varieties.
c) How flowering, fruit setting and pigmentation of tomato fruit are influenced by temperature?
d) Mention tomato varieties resistant to biotic stress 1 + 4 + 1 + 4 = 10
 2. a) Describe improved method of cultivation of brinjal in the light of sowing season, transplanting and nutritional requirement.
b) Suggest control measures for bacterial wilt and phomopsis blight in brinjal 6 + 4 = 10
 3. a) Write origin and economic importance of okra.
b) Write improved package of practices for its cultivation with respect season, seed rate, sowing and harvesting of fruit .
b) Indicate possible remedies to overcome YVMV disease of okra. 2+6+2 = 10
 4. a) State the salient characteristics of cucurbitaceous vegetables.
b) What are the reasons for modification of sex-ratio and how it can be improved ?
c) Discuss methods of sowing in watermelon and planting in pointed gourd. Indicate the maturity indices in muskmelon and cucumber 2 + 4 + 4 = 10
 5. Narrate production technologies of bottlegourd with special reference to climate, sowing parameters, nutritional requirement, water requirement and harvesting. 10
 6. a) Enumerate the importance of leafy vegetables in human nutrition.
b) Mention the cultivated species of amaranthus and basella.
b) Describe improved method of amaranthus cultivation. 2 + 3 + 5 = 10
 7. a) Write the uses of sweet potato.
b) State the influence of soil and climatic factors on sweet potato cultivation.
c) Discuss production technologies of sweet potato with respect to planting, interculture and maturity determination. 2 + 2 + 6 = 10
 8. Write short notes on **any five** of the following topics: 2 x 5 = 10
 - a) Different stages of harvesting of tomato fruit
 - b) Important diseases of cucurbits
 - c) Seedless watermelon
 - d) Flowering and fruit set in brinjal
 - e) Influence of climatic factors on fruit quality of melon
 - f) Improved varieties of French bean
 - g) Minor warm season vegetables
 - h) Varieties of chilli
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M.Sc.(Ag.) Examination, 2016
Semester – I
Horticulture
Course No. HOR-531
(Fundamentals of Floriculture and Landscape Architecture)

Time: Three hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. Define gardening. Mention the different types of gardening. Describe in brief about the different styles of gardening with suitable examples. 1+3+6=10
 2. What are major garden plant components? Differentiate between edges and hedges with examples. 8+2=10
 3. What do you mean by lawn? Mention the different methods of turfing. Write in details about the turf management at tropical region? 1+2+7=10
 4. Differentiate between sexual and asexual propagation methods of ornamental plants. Write in details about the asexual methods of propagation of ornamental plants. What do you mean by pro-tray nursery? 2+6+2=10
 5. What do you mean by wintering of rose? Write in details about the climatic requirement and commercial varieties, manures and fertilizers, stage of harvesting and IPM and IDM management of roses. 2+8=10
 6. Write in details about the commercial cultivation practices of gladiolus. 10
 7. Define bio-aesthetic planning. Write in details about the necessity of eco-tourism development in an urban area? 2+8=10
 8. Write in brief about the followings: 2 x 5 = 10
 - i) Commercial flower production area in India.
 - ii) Japanese garden
 - iii) Climbers and creepers
 - iv) Indoor gardening
 - v) Flower arrangement
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M.Sc.(Ag.). Examination, 2016
Semester – III
Horticulture
Course No. HOR-532
(Production Technology of Cut Flowers)

Time: Three hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer **any five** questions

1. What is the importance and scope of cut flower production in India? State the global scenario of cut flower production. Write in brief about the potential bottlenecks for expansion of commercial floriculture in India. (2+2)+3+3 = 10
2. Write short notes on (**any five**): 2 x 5 = 10
 - a. Protected cultivation
 - b. Plant growth regulator
 - c. Flower forcing
 - d. Soilless growing media
 - e. Cool-chain
 - f. Agri-Export Zone
 - g. Exotic flowers
 - h. Ornamental lilies
3. Mention the botanical name, plant family, centre of origin and five commercial cultivars of gladiolus. State the ideal agro-climatic conditions for growing gladiolus under open condition. How gladiolus is propagated? Write about the water and nutrient management, special horticultural practices, harvesting and yield of gladiolus for commercial cultivation. 2+2+2+4 = 10
4. Write in detail about the commercial cultivation of tuberose. 10
5. State botanical name, plant family, centre of origin and method of propagation of carnation. Differentiate between Standard and Spray carnation. Write in brief about the pinching techniques of carnation. Describe the microclimate requirement for cut flower production of carnation. What is calyx splitting of carnation? 2+2+2+2+2 = 10
6. Discuss about the different classes of roses for cut flower production. How roses are propagated commercially? What is 'Wintering' of rose? Write in detail about the microclimatic requirement and nutrient management of roses for quality cut flower production. 2+2+2+(2+2) = 10
7. Differentiate between (**any five**): 2 x 5 = 10
 - a. Pinching and Disbudding
 - b. Single and Double tuberose
 - c. Monopodial and Sympodial orchid
 - d. Large and Small flowering chrysanthemum
 - e. Foliage and Flowering anthurium
 - f. Heliconia and Bird of Paradise
 - g. Pulsing and Precooling
8. Mention the botanical name, family, centre of origin and method of propagation of gerbera. Write in brief about the microclimatic requirement of gerbera for cut flower production. State the ideal growing media and growing media preparation for commercial cultivation of gerbera. Discuss about the water and nutrient management, harvesting and yield of gerbera. 2+3+2+3 = 10

