MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Sc.(Agrl)

Semester: III (New)	**Academic Year:** 2014 - 2015
Course No: HORT - 232	**Title:** Production Technology of Vegetables and Flowers
Credits: 2(1+1)	
Day & Date	**Time:** **Total Marks:** 40

Note: 1. Solve ANY EIGHT questions from SECTION "A"
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

Model Answer Paper
SECTION "A"

Q.1 Describe the scope and importance of vegetable growing in India (2 Marks)
1) To meet the requirement of vegetable in the diet 2) Development of big cities and taluka places 3) Advanced techniques are available for higher yield a) Use of starter solution b) Use of growth regulators c) Short duration and high yielding varieties d) Improvement in cultural practices e) Off season crops f) Use of bacterial culture g) Foliar sprays 4) Quick transport, irrigation and storage facilities are available 5) Companion crops can be taken for higher returns 6) Export potential 7) Scope for vegetable seed production 8) Rainfed vegetable can be grown by poor farmers 9) Maximum use of land, labour and capital, hence employment to family member is possible 10) Scope for processing of vegetable e.g canning, dehydration, pickles etc. **(2 Marks)**
Importance 1) Nutritional importance 2) Importance in national economy 3) Importance in processing industry 4) Employment generation
Brief explanation of above points is essential

Q.2 Explain in brief the cultivation of cauliflower on following points (1 mark for each)
1. Soil and climate: Can be grown in all type of soils except marshy soils. Best soils are sandy loam, clay soils give less yield. For early crop medium to heavy soils are better. best Ph is 6 to 7.
2. Blanching: this operation is done just after the emergence of the curd to protect the curds from sunlight and helps to improve the quality. This operation is done by covering the heads with the leaves of the plant or by fastening the tips of the leaves over the head with rubber band.
3. Important varieties: Early group: Pusa katki and Pusa Depali
Mid season group: Pusa Shubra and Pant Shubra
Late group: Dania, Pusa Snow ball and Indam - 19
4. Whip tail: It is one of the physiological disorder which is noticed in cauliflower which is caused due to deficiency of micronutrient molybdenum. In young plants the symptoms re chlorosis of leaf margin and whole leaf turn white. The leaf blde do not develop properly. If deficiency is severe only midrib develop. The growing point of plant is deformed which prevents curd development. It occurs in acidic soils having pH less than 5.5 and can be control by application of sodium molybdate @ 10 – 15kg/ha.

Q.3 Explain in brief the cultivation of tomato on following points (1 mark for each)

1. Raising of nursery: Raised be of 3 mt length, 1 mt width and 15 cm ht are prepared. Apply each bed 5 – 7 kg Well decomposed FYM, 50 g Copper oxychloride and 100 to 150g Suphla (mixed fertilizer) and mix it thoroughly in the bed. Sow the seed in rows at 1 cm depth and cover with fine soil or FYM and irrigate the bed with rose can. After germination of seed irrigation can be given by channel. Seedlings are ready for transplanting withen a period of 3 to 5 weeks.

2. Staking : The yield and fruit quality is found to be improved due to staking and reduces the infection of fungal diseases. Wood sticks are used for stalking. Staking is done just before flowering.

3. Important varieties: Phule Raja, Dhanashree, Bhagyashree, Sioux, Pusa ruby, Pusa early dwarf, Pusa red plum, Roma and etc.

4. Maturity indices for different purpose: Harvesting of fruits is done at stages such as 1) Green stage – Distant market 2) Turning or breaker stage – Long distant market 3) Pink stage- long distant market 4) Red ripe stage – Table purpose 5) Full ripe stage: Processing.

Q.4 Explain in brief the cultivation of potato on following points) (1 mark for each)

1. Nutritional value: The main energy providing nutrient in potato is carbohydrate in the form of starch, Sucrose, glucose and fructose are the main sugars present in potato.Potato contains about 14% starch, 0.1% fat, 2% protein on fresh weight basis, rich in Vit-C, good source of minerals viz; K, P, Mg and Zn. Rich in phyto chemicals like phenolic acids and phytochemicals and also contain dietary fiber.

2. Soil and climate: potato grows well on well drained sandy loam to clay loam soils rich in humus. Potato plant prefers acidic to neutral soils with a pH range of 5.5 to 7.5. High or low pH hinders the plant growth besides affecting nutrient availability to the plant. Good crop is observed when days are sunny and nights are cool. Low temperature high light intensity and short days are conducive for tuber development. Maximum tuberization takes place at 18 – 20^0 C and is inhibited at 29^0C. In nutshell frost free, sunny days and cool nights are ideal for potato crop

3. Varieties suitable for processing Kufri Chipsona -1, Kufri Chipsona – 2, Kufri Jyoti, Kufri – Lavkar and Kufri Chandramukhi are the only varieties suitable for processing as they contain more than 20% dry matter, low reducing sugars and low phenols.

4. Dehaulming: In north India there are long day periods and hence even the potato tubers are mature the yellowing of leaves and leaf fall do not take place hence the haulms (stems) are to be cut 12 – 15 days after maturity of tubers. As the vegetative part of the plant is cut the photosynthetic activity is stopped. The peel of the tubers automatically becomes hard withen 12 – 15 days and then harvesting is done. In Maharashtra there are short day conditions and hence at maturity period the yellowing of leaves there drying and leaf fall is noticed. When total leaf fall takes place the hardening of peel takes place and further the crop is harvested. Dehaulming is not done in Maharashtra.

Q. 5 Describe the cultivation of gladiolus on following points (1 mark for each)

1. Soil and climate : Well drained loam soils Ph 5.5 to 6.5 Sunny situation favorable, frost and strong wind harmful, moderate humid climate produce big size spike,

2. Propagation: By corms and cormels. Corms of 4-5 cm diameter and of conical shape give quality bloom. Corm treatment with fungicide,

3. Important varieties: Phule Tejas, Phule Prerna, Phule Ganesh, Phule Neelrekha, Friendship,

Oskar, etc.

4. Harvesting of spike and corm: Harvesting period Nov – Jan. For local market harvest when 1-2 lower florets have opened for export purpose harvest unopened bud which have developed full colour. Corms are dug out after the leaves become yellow and start drying.

Q.6 Give the information on rose on following points **(1 mark for each)**

1. Commercial method of propagation: T budding or shield budding using Rosa indica or mutiflora as a root stock

2. Types of roses: Hybrid Tea, Floribunda, Polyantha, Grandiflora, Miniature, Climbers, Creepers, Ramblers, Moss, Cabbage, Musk, Shrub and Austrian briars.

3. Pruning of roses: Done twice in Maharashtra in June and Oct for better frame work and quality blooms as flowering in rose is noticed on new growth. Three types of pruning - light, moderate and heavy. For Exhibition purpose heavy pruning and for commercial purpose moderate pruning is done. Criss cross, disease affected branches arising from root stock are pruned.

4. Harvesting and yield: For local market when 1 or 2 petals are opened or flower is fully opened and for export and long distance market at tight bud stage. **Yield:** First year -30-40 flowers /plant/yr. From third year onwards 50-65 lowers /plant/yr

Q.7 Write short notes (Any two)

1. Market gardening: In this type vegetables are grown for local market, the gardens are located 10-15 miles in the vicinity of city area. The vegetables are grown throughout the year, considering the demand, taste and liking of the consumer. As the gardens are located near the city area the cost of land, labour is high therefore to harvest large returns per unit areas the grower has to follow intensive method of cultivation like companion cropping, inter cropping for maximum use of land and labour. For market gardening crops like leafy vegetables, cabbage, cauliflower, knol khol, tomato, chilli etc. Short duration and high yielding varieties are used to catch the early market and get maximum returns.

2. Important varieties of jasmine

Mogra: Motia, Madanban, Ramban, Ramnathpuram, Bela, Rai, Virupakshi, Gundumulli
Jui: Co-1, Mullai, Parimulli, Large round, Short point
Jai: Co-1, Pinchi, Thimmapuram, Coimbtore, Pink pin
Kunda: Kakada

3. Maturity indices of water melon

Withering of tendril: The first tendril near the stalk of fruit dries and withers.
Thumping sound: Ripe fruits when thumped with finger give dull sound.
Colour of ground spot: The portion of the fruit which touches the ground gives yellow tinge.
Pressure of fruit: when ripe gives crisp, cracking noise when pressed with both the hands.

Q.8 Describe the cultivation of onion on following points. **(1 mark for each)**

1. Planting season: Kharif: June – July, Late Kharif: Sep – Oct and Rabi: Nov- Dec.
2. Use of weedicide: use of weedicide like Pendyamethiline (Stamp) and oxyflurofane (Gol).
3. Important kharif varieties: Kharif: Baswant – 780, AFDR, Arka niketan, Arka kalian, Phule safed etc.
4. Bolting in onion: When onion crop is grown for bulbs some premature seed stalks are produced before completing the normal life cycle of the onion bulbs is known as bolting. The bulb developed is fibrous and light in weight. The leaves and the bulbs are unfit for consumption. The bolted bulbs have poor keeping quality. It occurs due to fluctuation in the climate. For its control spraying of MH – 40 @ 250 ppm 60 days after transplanting is followed.

Q.9 Write the commercial cultivation of bhendi on following points

1. Management of yellow vein mosaic: Since the disease spread by sucking pest (White fly). This vector should be controlled by spraying of diamethoate @ 10 to 15ml/ 10 liter of water. The affected plants should be uprooted and destroyed. Use of resistant varieties

2. Manures and fertilizers: 20 T-FYM and 100:50:50 kg NPK/ha.

3. Seed rate and spacing: 12 – 15 kg/ha and spacing 30 x 15 cm.

4. Harvesting and yield: Okra comes to harvesting within a period of 35 to 38 days from sowing of seed. The pods are harvested 5 to 6 days after flowering. Harvesting should be done at every alternate day. Harvesting should be done in morning or evening hours. At time of harvesting due to spiny nature one should use the okra cutter or use of gloves is preferred.

Q.10 Enlist different types and styles of gardens and explain any one of them.

Garden types: Formal garden, Informal garden and Wild garden **(1 mark each)**

Garden styles: English garden, Japanese garden, Persian garden, Italian garden, Mughal garden French garden **(2 marks)**

Explanation of above any one type and style of garden with important features should be taken into consideration.

SECTION "B"

Q.11 Do as directed

1. United Kingdom and Iran
2. Indian Institute of Vegetable Research
3. Konkan Ashwini and Konkan Varsha
4. Bangalore

Q.12 Match the pairs

"A"	"B"
1. Broccoli	b. Anti cancer vegetable
2. Bitter gourd	d. Cheratin
3. Tuberose bulbs	a. Lycorine
4. Indoor plant	c. Dieffenbachia

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