PANJABRAO DESHMUKH KRISHI VIDYAPEETH ,AKOLA

SEMESTER END EXAMINATION

B.Sc. (Hons)Hort

Semester: V (NEW) **Academic Year : 2019-2020**
Course No: H/FS-359 Title: Orchard and Estate management
Credits: 2 (1+1) **Total Marks: 40**
Day and Date:16/01/2020 Time: 1.00 hours

Note:1Note: 1. Solve any Four question from SECTION 'A' — 16

2 Solve any SIX question from SECTION 'B' — 12

3.All question fromSECTION 'C'arecompulsory . — 12

40

4 Send the PDF file of answer sheet to the email id of respective course teacher

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SECTION 'A'

(Write the answer in4-5 sentencesonly .Each question carries 4 marks)

Q.1 Write in brief any four importance of orchard and estate management .

Ans :
Importance

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Human diet – protein and carbohydrates,minerals, calorific value,
Produce higher biomass, highly remunerative, Have potential for develpment of wasteland, nutritional security,.

Q.2 Write in brief the objectives to establish fruit ochard .

Ans

Commercial
Private
Experimental
Germplasm conservation
Teaching,demonstration and training
Propagation
Control soil erosion
Utilization of inferior land
Afforestration

Q.3 Write the advantages of High Density Plantingof fruit crops .

Advantages - occupy maximum plant population in minimum area.

Higher population density help in higher productivity.

Cultural practices like spraying etc get easy due to dwarf stature

Quality production is possible my maintaining number of fruit.

Q.4 Mention the system of irrigation used in fruitorchardandexplaininbrief any one of them .

Spot irrigation in ring
Flood irrigation
Basin irrigation
Furrow system of irrigation
Overhead or sprinkler system of irrigation
Slope irrigation
Drip irrigation

Q. 5 Explain in brief any one planting systems used for fruit crops .

Planting System

The plan showing the arrangement of plants in an orchard is known as Orchard Layout. The plants are arranged in the garden in several ways, but the following are the most common systems of planting.

1. Square 2. Rectangular 3. Quincunx or filler or diagonal
4. Hexagonal 5. Contour

Square systems of planting :

This is the very simplest of all systems. The distance between the rows and plants in the rows is the same and four plants are planted on the four corners of a square.

SECTION "B"

(Write the answer in one sentence .Each question carry 2marks)

Q. 6 Define the following :Any six

1)**Crop regulation** :.A range of method used to increase produtiuon with fruit quality which influence fruit growth and fruit saze at harvest.

2) **Crop model** : - A pattern of formal way of present quantitative knowledge about how crop gow in interaction with its environment .

3) **Rejuvenation**-Regeneration of new shoots following pruning,cultivation and fertilization with a view to induce juvenility in plants

4) **Rootstock**-The plant or part on which the scion is worked upon to produce the final tree is rootstock .

5) **Wind break**- Wind break consist of planting trees,shrubs or artificial barriers on the windward side of an orchard for protection from wind

6) **Mulching:** Mulch is a loose cover of extraneous material on soil surface to minimize the evaporation of water from soil.

7)**Cropping system** is defined as the pattern followed on a farm and its interactions with farm recourses, other farm enterprises and production technology is known as cropping system.

SECTION "C"

(Choose the correct option.Each question carry 1mark)

Q. 7 Chose correct option.

1. Khirni is used as a rootstock in

a) Citrus b) Papaya **c) Sapota** d) Mango

2. The filler tree in mango orchard is

a) Papaya b) Apple c) Ber d) Pomegranate

3 HDP for mandarin is generally plantedat spacing

a) 6X6mt b) 5X 5mt c)**6X3mt**d)3X 2mt

4. Seedless cultivars of Acidilime is

a) Pramalini b) Vikram **c) P D K VChakadhar** d) PKM-1

5. The February flowering in citrus is known as

a) Ambebahar b) MrigBahar c) Hasta bahar d) None

6.'Papain 'is processed product of fruit crops

a) Mango b)Guavac)**Papaya** d) Grape

7.Alternative bearing is most commmon in

a) Mango b) Papaya c) Citrus d) Fig

8. The process of scratching or injuring the seed coat for facilitate seed germination

a) **Scarification** b) Scalding c) Stratification d) None of these

9. The low temperature requirement for flowering is called as

a)Chilling effect b)**Vernalizationc**) low temperature d)Production

10. High temperature related to

a)Aerationb)**Climate aberrations** c)Vernalizationd) Production

11. Better soil aeration related to

a) **Clean cultivation** b) soil improvement c) Remove weeds

d) Production

12.Notching is done in fruit crop

a) Pomegranateb)**Fig** c) Acidlime d) Banana

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MODEL ANSWER

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE

SEMESTER END EXAMINATION

B. Sc. (Hons.) Horticulture

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SECTION "A"

Q.1	Describe in brief different systems of planting of orchard crops. 1. **Square system:** This system is considered as the simples of all the system of planting and followed widely. In this system of planting, equal spacing is given fir all the trees. In this system, the plot is divided into square shape and trees are planted at four corners of the square in straight rows at right angle. Intercrops can be cultivated. 2. **Rectangular system:** Here also, trees are planted on each corner of a rectangle. The distance between any two rows is more than the distance between any two trees in a row. Like in square system, raining intercrop's is also possible in this system. The only difference in this system is, more plants can be accommodated in the row, keeping more space between the rows. 3. **Triangular shape:** The trees are planted as in square system but the difference being that those in the even-numbered rows are mid-way between those in the odd rows instead of opposite to them. It accommodates less number of trees than the square system. It is difficult both to layout and cultivate trees in this system. Only advantage of this system is, more open space is available for the spread of the trees and intercrops 4. **Hexagonal system:** In this system, trees are planted in each corner of an equilateral triangle. Here six trees form a hexagon with the 7^{th} tree at the centre. This system follows alternate row planting pattern as no tree in a row is perpendicular to a tree in the adjacent row. This system can be followed when there is ample supply of water in a highly fertile, valued land. 5. **Quincunx or diagonal system:** This is nothing but the square system with plants in the centre of the square. Eventhough this system of planting accommodates double the number of plants, it does not provide equal spacing between plants. the central 5^{th} tree, actually a filler tree, is quick and erect growing and early maturing, like banana, pomegranate, papaya which would be removed as soon as the main trees planted at the corners come to bearing. 6. **Contour system:** This system of planting is followed mainly in the hills with slopes, where the land is with undulating topography and greater damage of erosion and difficulty of irrigation persist. On undulated

	lands, generally bench terracing may be done after the trees are planted. Trees can be planted on terraces or along contours. As the tree position can be decided only on the spot, the trees will not be equal-distant. This type of system is good for shallow soils where terracing will expose rocky or poor sub soil. Irrigation and cultivation can be done along tree rows only.
Q.2	**a) Enlist different irrigation methods and write in detail about drip irrigation method.** Enlist different irrigation methods. **A. Surface irrigation** Flooding Check Basins Ring Bed Furrow Overhead irrigation Drip irrigation **b) Write in detail drip irrigation method.** Drip irrigation is known by various names like 'trickle irrigation or high frequency irrigation daily flower irrigation' This is a method of watering plants at a rate equivalent to its consumptive on so that plants would not experience any stress during the growin phase. In this the water is conveyed from a source under low pressure to the root zone of the crop only. It has the following components 1. Water supply pump at the source of water 2. filters, fertilizer mixing tank, 3. Control system 4. pressure regulators, 5. monitor valve/water meter, 6. head lines or main lines for conveying water from pumpset to the field where water is to be delivered. 7. Laterals to carry water to plant rows and 8. the emitters/dripper through which water is finally released at a distance of 5 to 25 cm from the plant base. **Advantages** 1. Water saving – water is applied directly to the root zone, eliminating wastage. 30 to 70 percent water saving 2. Labour saving – This is eliminates the need for constructing borders, bunds and labour intensive works associated with conventional irrigation techniques, there by saving about to 60to90% 3. Use of lower quality water – water is applied continuously and the root zone is kept wet constantly. 4. Increased yield and plant vigor – It maintains soil moisture at optimum

	level eliminating water stress resulting in greater vigour, better establishment and high productivity. 5. Reduced weed growth – Since water is applied to the restricted area, wide spread weed growth is inhibited due to restricted water supply 6. Saving of nutrients – nutrients are directly applied to the root zone along with water. Leaching losses are minimized. saving upto 30 to 60% **Disadvantages** 1. Higher initial investment 2. Clogging of drippers due to oxidants, bi oxides and algae.
Q.3	Describe in brief clean cultivation, sod culture and sod mulch. I. Clean cultivation This type of cultivation is extensively followed in India. This involves regular ploughing and removal of weeds. The clean culture has many disadvantages 1. Humus will be completely depleted rapidly due to frequent cultivation. 2. Frequent cultivation causes injury to the feeding roots and the trees may be short lived or stunted in growth. 3. Clean cultivation aids in more aeration leading to the depletion of nitrogen 4. Hard pan is created in the soil 5. Frequent cultivation causes more soil erosion Sod culture In this method, permanent cover of grass is raised in the orchard and not tillage is given. This type of orchard cultivation is followed in USA and Europe. This may be useful in sloppy lands for preventing soil erosion. But they compete for soil moisture and available nitrogen. The drawbacks of this system are the need for increased manuring and water application. They are harmful to shallow rooted trees. Sod mulch This is similar to sod and the only difference is that the vegetation is cut frequently and the cut material is allowed to remain on the ground. This is slightly better than the previous one, as the moisture loss is not so great as in sod – in both sod and sod mulch, more nitrogen should be applied to the fruit trees than usual application because the vegetation utilizes more soil nitrogen.
Q.4	a) Enlist different methods of grafting used for rejuvenation of fruit tree. 1. Cleft grafting: Side grafting: 2. Crown grafting: 3. Bridge grafting: 4. Top working:

	b) Write in detail about cleft or wedge grafting? This is one of the oldest methods grafting. It is usually is done during the early spring. In this method, the limb or the main stem is first sawed off and a vertical split of about 5-7.5 cm long is given down the center of the stem to be grafted. The split is then kept open by inserting a screw driver of chisel in the split. The scion is prepared by cutting the end in the shape of wedge of about 5cm in length. The scion should be 7.5-10cm long having at least 2-3 buds. The scions are inserted one in each side of the cleft. If the scion is not held tightly in the cleft, the graft is tied and the grafted portion is covered with grafting wax.
Q.5	a) Define high density planting. Planting of fruit trees rather at a closer spacing than the recommended one using certain special techniques with the sole objective of obtaining maximum productivity per unit area without sacrificing quality is often referred as 'High density planting' or HDP. b) Discuss in brief advantages and disadvantages of high density planting. **Advantages:** 1) It induces precocity/precocious bearing 2) Higher yields. The average yield in apple is about 5.0 t/ha under normal system of planting and it is about 140.0 t/ha under high density planting. 3) Higher returns per unit area 4) Early returns 5) Easy management of orchard tress 6) Reduces labour cost resulting in low cost of production 7) Enables the mechanization of fruit crop production and facilitates more efficient use of fertilizers, water, solar radiation, fungicides, herbicides and pesticides. **Dis- advantages of high density planting:** 1) HDP results in overcrowding, over lapping not only in the tops, but also in the root system and heavy competition for space, nutrients and water. 2) More important is build-up of high humidity, lack of cross ventilation in the orchard, which is more conducive for build-up of pests and diseases. 3) Reduction in yield in the long run after 10-12 years of age. 4) Production of small sized fruits and poor quality fruits.
Q.6	Write in brief factors leading to unfruitfulness. Internal - Evolutionary - Genetics - Physiological External - Nutritional - Pruning - Locality

	- Temperature - Environment - Insect- pests and diseases
Q.7	a) Define Integrated Nutrient Management. **Integrated Nutrient Management (definition):** The combined use of different sources of plant nutrients i.e. organic, biological and inorganic amendments for the maintenance and improvement of soil fertility and plant nutrient supply at an optimum level for desired crop productivity may be termed as integrated nutrient management. b) Discuss the importance of INM. **Importance of INM** • The INMS helps to restore and sustain soil fertility and crop productivity. • It may also help to check the emerging deficiency of nutrients other than NPK. • It brings economy and efficiency in fertilizer use and favourably affects the physical, chemical and biological environment of soil. • It helps to produce fruits of high nutritional quality in sufficient quantity. • Currently, decreasing soil fertility has also raised concerns about the sustainability of agricultural production. • Future strategies for increasing agricultural productivity will have to focus on using available nutrient resources more efficiently, effectively than in the past. • Integrated management of the nutrients is needed for proper plant growth, together with effective crop, water, soil, and land management.
Q.8.	a) Define crop model. Crop Model It is defined as "an attempt to describe a certain process or a system through the use of a simplified representation, preferably a quantitative mathematical expression that focuses on relatively few key variables that control the process or a system" b) Write in brief about utility of crop models. **Utility of crop models** • Crop models help us to understand the crop production process or system in a more systematic way. • The process of modeling is often equated to solving of a puzzle. A puzzle has to be considered as a whole even if we need to fit a one small block. Crop models provide us quantitative information about the amount of inputs like the doses of fertilizers, number of irrigations, amount of insecticides/pesticides, etc. required. • These models also help us to consider various input requirements under different climatic conditions. This means models help us to get reasonably clearer picture of otherwise hazy scene.