Proof. S.B. Vidhate

K.K.V. Harni, Nashik

MODEL ANSWER

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

Semester	: II (New)	Academic year: 2016-17	
Course No.	: H/HORT 123	Title:	Growth & Development of Horticultural Crops
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 (s) wherever necessary.

SECTION "A"

Q.1 Define photoperiodism and describe its types.

Ans. The response of plant to the relative length of day and night within 24 hours. (1)

~~Classified in three categories~~ Type of photoperiodism : (3)

i) Short day plants -

ii) Long day plants -

iii) Day neutral plants -

Q.2 What is seed dormancy? Give its causes and methods to overcome it.

Ans. Dormancy is a state in which viable seeds fail to germinate under conditions of moisture, temperature and oxygen favorable for vegetative growth (1)

Causes of seed dormancy (3)

i) Physiologically immature embryo-

ii) Mechanically resistant seed coat-

(1)

iv) Presence of germination inhibitors –

v) Seeds having chilling requirements-

Methods to overcome

i) Scarification – Physical and chemical

ii) Stratification –Low temperature

iii) Soaking of seed in water-

iv) Use of growth regulators-

Q.3 Describe in brief the physiology of climacteric and non climacteric fruits.

Ans. Ripening was associated with spectacular changes in respiratory rates, including a lowering of respiration in the mature fruits, followed by large increase in respiration during the time of ripening. (1)

Climacteric fruits-

The period of occurrence of climacteric peak in fruits are called climacteric fruits. eg. mango, papaya, banana, pears etc.

Non climacteric fruits –

The rate of respiration remains steady during their ripening eg. Orange, lemon, citrus etc.

Climacteric rise has been affected by low oxygen and increased concentration of carbon dioxide. Both these factors prevent climacteric rise and improves storage quality of fruits. (3)

Q.4 Define plant growth. Explain in brief its phases in horticultural crops.

Ans. Growth may be defined as permanent and irreversible increase in size of cell, organ or whole organism. (1)

Growth Phases (3)

i) Lag phase

ii) Log phase/Exponential phase

iii) Stationary phase /Steady state

Q.5. Write in short physiological role of Gibberellins. (4)

Ans. **Physiological role of Gibberellins**

i) Acceleration of seed germination-
ii) Stimulation of bud break and increased lateral branching-
iii) Stimulation of fruit set –
iv) Breaking of dormancy-
v) Reduction in fruit set –
vi) Increase fruit size and quality-
vii) Increased vegetative growth and yield
viii) Delayed senescence and fruit ripening

Q.6 What is flower bud differentiation? Explain the factors affecting flower bud formation.

Ans. Floral bud differentiation is the stage during which vegetative bud is biochemically stimulated and changed to reproductive bud. (1)

Flower bud initiation- refers to anatomical and morphological changes occurring within the bud

Differentiation of flower bud- refers to the further development of the embryonic flower within the bud.

Factors affecting flower bud formation

i. Nutritional
ii. Environmental
iii. Cultural factors (3)

Q.7 Write short notes (Any Two).

Ans.

1. Parthenocarpy

Refers to the ability of plant to develop its fruits pollination and fertilization

Types of Parthenocarpy

Vegetative- banana

Stimulative- Allahabad round guava and black Corinth variety of grape

Stenospermocarpy- Thompson seedless (2)

2. **Vernalization**

Methods of inducing early flowering in plants by pretreatment of the propagating material with very low temperature.

Practical utility of vernalization

i) Early bearing

ii) Crop can be grown in regions where they do not naturally reproduce

iii) Plant breeding (2)

3. **Fruit set**

Development of the ovary and the adjacent tissues following the blossoming period is known as fruit set. The number of flowers which are colonized develop into fruit vary widely.

Factors associated with fruit set

i) Pollination followed by germination of the pollen grain and growth of the pollen tube leading ultimately to fertilization.

ii) Presence of large amount of auxin in the pollen and the density of pollen on the stigma has a marked effect on fruit set

iii) High temperature at flowering dry up the stigmatic fluid and pollination and fertilization affect the fruit set.

iv) Use of synthetic growth regulators viz. NAA and 2, 4-D (2)

Q.8 Describe in brief the physiological role of Auxins.

Ans. **Physiological role of Auxins**

a. Stem elongation
b. To induce rooting in cuttings
c. To prevent fruit drop in fruit trees
d. To increase blossom and fruit set
e. For fruit thinning
f. For defoliation before harvesting
g. To prevent sprouting of stored produce e.g. potato
h. Weedicide (4)

Q.9 What is fruit drop? Discuss in brief types of fruit drop.

Ans. Dropping of fruits at different stages of fruit development due to competition among the growing fruitlets, lack of pollination, fertilization un-favourable environmental conditions and hormonal imbalance is called as fruit drop. (1)

(4)

Different types of fruit drop

i) Post setting drop

ii) Summer drop

iii) Pre mature fruit drop

iv) Pre harvest drop (3)

Q.10 Define the term juvenility and describe in brief physiological expressions of juvenility.

Ans. State of vigorous vegetative growth during which plant can't readily induce flowering or reproductive phase. (1)

Physiological expressions of juvenility

i) Juvenile wood roots easily.

ii) Juvenile wood has more capacity to retain leaves.

iii) Juvenile growth is vigorous.

iv) Juvenile wood has high concentration of Auxins, GA & cytokinines.

v) Juvenile form has high apical dominance

vi) Juvenile scion takes more time for flowering. (3)

SECTION "B"

Q.11 Fill in the blanks

1. Development of plant or plant part in absence of light is called **etiolation**
2. Tomato is photoperiodically **day neutral** plant
3. **Leaf area index** is the ratio of the leaf area of a plant to the gound area occupied by the plant
4. Cytokinins widely occur in **root** part of higher plants. (4)

Q.12 Define the following terms

1. **Abscission**: shedding of plant part as a result of the formation of an abscission layer of loosely adhering cells at its base which breaks apart readily.

2. **Apical dominance:** it is the inhibitory effect of a terminal bud upon lateral bud development

3. **Maturity:** refers to having completed natural growth and development.

4. **Flowering:** conversion of a vegetative apex in to floral one from inception to anthesis

(4)

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Signature of the Course Instructor

Sign :

Name : Dr. P.V. Patil

Phone No : 020-25537646 Mobile : 7588513421

Signature of the Professor/Associate Dean, College of Horticulture, Pune

Sign :

Name : Dr. S.D. Masalkar

Phone No : 020-25537646 Mobile : 9404958915

I have checked the question paper as per the given checklist and the question paper is found correct.

Signature of the Head of the Department

Sign :

Name : Dr. S.A. Ranpise

Phone No : 02426-243247 Mobile : 9404980456

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