Registration No:_____	Uni. No:_____
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GUJARAT AGRICULTURAL UNIVERSITIES

1. Anand Agricultural University, Anand
2. Navsari Agricultural University, Navsari
3. Junagadh Agricultural University, Junagadh
4. S.D. Agricultural University, S.K. Nagar

Sixth Semester B.Sc. (Hons.) Agri. (Supplementary) End Examination 2014-15

PBG 6.6 : Principles of Plant Biotechnology (2+1)

"PART-B (Subjective)"

Date: 08.01.2015 **Time: 10.15 to 12.00 hrs**

Day : Thursday **Marks: 40.00**

Q.1 (A) Define / Explain the following **(Any Eight)** **4.0**

1. Sterilization
2. Callus
3. Androgenesis
4. Protoplast
5. Organogenesis
6. Biotechnology
7. Transformation
8. Primer
9. Restriction enzyme
10. Electrophoresis

Q.1 (B) Write the full form of the following **(Any Ten)** **2.0**

1. AFLP
2. T-DNA
3. IAA
4. BAC
5. BSA
6. RNA
7. cDNA
8. PCR
9. MAS
10. RAPD
11. PAGE
12. GA_3

Q.1 (C) Differentiate the following **(Any Four)** **4.0**

1. RAPD Vs. AFLP
2. Somatic embryogenesis Vs. Embryo culture
3. Anther culture Vs. Ovary culture
4. Direct Vs. Indirect methods of gene transfer
5. Sourthern blotting Vs. Northern blotting
6. Redifferentiation Vs. Dedifferentiation

Q.2 (A) Explain somatic embryogenesis with schematic representation along with its applications **5.0**

OR

Discuss micropropagation in detail along with its applications, advantages and disadvantages

Q.2 (B) Give scientific reason for the following **(Any Five)** **5.0**

1. Androgenesis is widely used as compared to gynogenesis
2. Type II restriction enzymes are widely used for gene cloning
3. Embryo abortion is observed during wide hybridization
4. Codominant markers are preferred over dominant markers
5. Sterilization is inevitable in any tissue culturc cxperiment
6. *Agrobacterium* mediated gene transfer method is most widely used
7. DNA markers are advantageous over morphological markers

(P.T.O.)

Q.3 (A) Give brief answers (**Any Five**) **5.0**

1. Enlist different types of cloning vectors
2. Applications of gynogenesis
3. Enlist factors affecting electrophoresis
4. Stages of micropropagation
5. Enlist different gene transfer methods
6. Causes of somaclonal variation
7. Problems associated with anther culture

Q.3 (B) What is a molecular marker ? Explain any one molecular marker technique along with its applications, advantages and disadvantages **5.0**

OR

What is PCR ? Give components of PCR reaction and discuss its steps along with the applications.

Q.4 Write short notes on following (**Any Four**) **10.0**

1. Applications of tissue culture in crop improvement
2. Recombinant DNA technology
3. Meristem culture
4. Marker assisted selection
5. Synthetic seed
6. *Agrobacterium* mediated plant transformation

AGRICULTURAL UNIVERSITIES OF GUJARAT
ANAND/NAVSARI/JUNAGADH/SARDARKRUSHINAGAR

Sixth Semester B.Sc. (Hons.) Agri. (Supplementary) End Examination 2014-15

Ag. Ento. 6.4: Pests of Horticultural Crops and their Management

Date: 12/01/2015 Time: 9:30 to 12:00 hrs

Day: Monday Total Marks: 80.00

PART-B SUBJECTIVE (Marks: 40.00)

Q.1 Describe the IPM strategies for the following pests (Any five) (10.0)

1. Tomato fruit borer
2. Chiku bud borer
3. Banana pseudostem weevil
4. Coconut red palm weevil
5. Brinjal shoot and fruit borer
6. Mango fruit fly
7. Phytophagous mites in ornamental crops
8. Termite damages in orchard crops

Q.2 Describe the nature of damage caused by the following pests (Any five) (10.0)

1. Guava bark eating caterpillar
2. Citrus fruit sucking moth
3. Rose aphid
4. Okra shoot and fruit borer
5. Mango hopper
6. Melon fruit fly
7. Rhinoceros beetle
8. Drumstick bud worm

Q.3 (A). Describe the life cycle of the following pests (Any five) (05.0)

1. Ber fruit fly
2. Sweet potato weevil
3. Custard apple mealy bug
4. Onion thrips
5. Citrus whitefly
6. Brinjal epilachna beetle
7. Black cut worm
8. White grub in orchard crops

(B). Give scientific reason for the following (Any five) (05.0)

1. Root feeding with biocides is adopted in coconut plantation.
2. Systemic destruction of wild weed plants in citrus orchard is advisable.
3. Collection and destruction of fallen fruits at a regular interval should be followed in sapota orchard.
4. Heaps of green grass is to be kept in the field during evening and burnt in the next day morning.
5. Flooding of infested fields of sweet potato for at least 48 hours after harvesting the tubers.
6. Fallen buds, flowers and weathered terminal shoots should be destroyed in okra field.
7. Circular holes are observed on tomato fruits without having excreta of damaging pest.
8. Chilli leaves develop crinkles and curl upward and symptoms are locally known as "*Kokadvo*".

Q.4 (A). Answer the following in brief (06.0)

1. Give the five important green house pests.
2. Enlist the virus diseases of fruits and vegetable crops with their vector name.
3. Describe the procedure for preparation of ply wood block trap for the management of orchard flies.
4. Enlist the major pests of ornamental crops with their damaging stages.
5. Give ecological based management strategy for *Helicoverpa armigera* in tomato crop.
6. Give morphological differences between male and female rhinoceros beetle.

(B). Write the chemical control measures for the following pests (Any four) (04.0)

1. Tea mosquito bug in cashewnut
2. Okra mite
3. Diamond back moth
4. Sucking pests of leafy vegetables
5. Rodents in orchard crops
6. *Spodoptera litura* in banana

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Reg. No. ..... Uni. No. ..... Supervisor's Sign. .....
Centre: ..... Marks obtained: .....

AGRICULTURAL UNIVERSITIES OF GUJARAT
ANAND/NAVSARI/JUNAGADH/SARDARKRUSHINAGAR
Sixth Semester B. Sc. (Hons.) Agri. (Supplementary) End Examination 2014-15
Ag. Ento. 6.4: Pests of Horticultural Crops and their Management

Date: 12/01/2015 **Time: 09:30 to 12:00 hrs**
Day: Monday **Total Marks: 80.00**

Note: Erased or overwritten answer(s) will not be examined.

PART - A: OBJECTIVE (Marks: 40.00 Time: 45 Minutes)

Q.1	ANS	**Write correct answer (A, B, C or D) in space provided before each question.** (30.0)
1.		Give the correct scientific name of brinjal shoot and fruit borer. A. *Leucinodes orbonalis* B. *Luecinodes orbonmalis* C. *Leucinodes arbonalis* D. *Luecinodes orbanalis*
2.		Coleopteran beetles are spherical, pale brown and mottled black spots while grubs are yellowish in colour and having stout hairs. A. Pulse beetle B. Epilachna beetle C. Rhinoceros beetle D. Pumpkin beetle
3.		Which pest is monophaagous in nature? A. *Helicoverpa armigera* B. *L. orbonalis* C. *Liriomyza trifolii* D. *Earias vittella*
4.		Name the pest which cuts the plant parts as well as root portion of potato. A. Spotted bollworm B. White grub C. American bollworm D. Cut worm
5.		Which insect is vector of YVM in okra? A. Whitefly B. Mites C. Leaf hopper D. Aphid
6.		___ as trap crop is advocated to manage the cabbage diamond back moth. A. Castor B. Cress C. Tomato D. Marigold
7.		Deformity of smooth guard fruits with gummy secretion at the site of oviposition injury gives the indication of the infestation due to ____. A. Melon fruit fly B. Pea stem fly C. Mustard sawfly D. Orchard fruit fly
8.		_____ is the vector of purple blotch in onion. A. Jassid B. Thrips C. Aphids D. Whitefly
9.		Which fruit fly species is neither attracted by Methyl Eugenol nor Cue lure traps? A. *Bactrocera zonata* B. *Bactrocera dorsalis* C. *Bactrocera diversus* D. *Bactrocera ciliatus*

10.		Which pesticide possesses the acaricidal property? A. Quinalphos B. Propargite C. Thiodicarb D. Chlorpyriphos
11.		_____ adult is found damaging to the tomato fruits. A. Hawk moth B. Til sphinx moth C. Fruit sucking moth D. Chiku moth
12.		Maggot feeds on fruit juice and rotten near stone which emits bad smell. A. Ber fruit borer B. Ber fruit fly C. Anar butterfly D. None of the above
13.		The insect feeds on leaves, shoots, buds and mainly on fruits of pomegranate by sucking the cell sap is _____. A. Aphid B. Fruit borer C. Fruit fly D. None of the above
14.		Young larva bores into rose bud and eats the internal content by thrusting the head inside the bud by leaving the rest of its body outside. A. Flower chaffer beetle B. Slug caterpillar C. Rose semilooper D. *Helicoverpa armigera*
15.		Larvae remian within the bored hole during day time and come out during night time to feed on the bark under siken galleries. A. *Bactrocera dorsalis* B. *Batocera rufomaculata* C. *Sternochetus mangiferae* D. *Inderbela tetraonis*
16.		Maggots bore inside the leaf tissues and feed within, resulting in formation of small raised wart like structure on the leaves. A. Mango leaf gall midge B. Mango leaf weevil C. Mango leaf miner D. Mango shoot borer
17.		Over wintering is in the adult stage by hiding in cracks and crevices of bark of mango trees. A. Mango hopper B. Mango fruit fly C. Mango stem borer D. Mango mealy bug
18.		Rusty reddish discoloration on the banana fingers with rusty growth over fruits and yellowing of leaves due to damage caused by _____. A. *Spodoptera litura* B. Thrips C. Aphid D. None of the above
19.		*Aceria guerreronis* is a pest of _____. A. Coconut B. Pomegranate C. Custard apple D. Guava
20.		Females are apterous, long, slender covered with white waxy secretion, pair of waxy filaments and males are wingless. A. Jassids B. Aphids C. Mealy bug D. Psylla
21.		Curling of chilli leaves is observed due to the infestation of _____. A. Mites B. Fruit borer C. Thrips D. Aphid

22.		Larvae are pinkish in colour with three dorso-lateral brown stripes on thorax and generally make hole on the basal portion of sapota buds. A. Chiku bud borer B. Chiku margin folder C. Chiku seed borer D. Chiku moth
23.		Adult is large with very long antennae and short thick spine like projection on either side of the thorax whereas full grown grub measure about 10 cm in length, fleshy and stout with well defined segmentation. A. Mango nut weevil B. Mango stem borer C. Mango shoot borer D. Mango fruit borer
24.		Adult on rest folds its wings while its abdomen remains upward is observed in _____ insect. A. Scale B. Aphids C. Mealy bug D. Psylla
25.		Adult butterfly is medium sized, glossy bluish violet (male) to brownish violet (female) in colour with an orange patch on forewing. A. Anar butterfly B. Fruit sucking moth C. Sapota semilooper D. Chiku moth
26.		The principal form of damage to sweet potato is mining of the tubers by larvae. The infested tuber is often riddled with cavities, spongy in appearance and dark in colour. A. Cut worm B. Sweet potato weevil C. Potato tuber moth D. None of the above
27.		Damaging stage of rhinoceros beetle is _____. A. Grub B. Adult C. Both grubs and adult D. None of the above
28.		"Snake flute chamber" like damage symptoms are seen on aonla twigs. A. Leaf roller B. Aphids C. Gall maker D. Bark eating caterpillar
29.		Black larva with red white spots and feeds on spider lily leaves while adult is a brown with yellow and red markings. A. Lily caterpillar B. Cut worm C. *Spodoptera litura* D. Leaf miner
30.		Aggregation pheromone trap is used to attract the adults of _____. A. Coconut rhinoceros beetle B. Chiku moth C. Fruit fly D. Fruit sucking moth

(PTO)

Q.2 Match the following techniques with their target pest (10.0)

ANS	Name of technique		Target pest
	1. Root feeding of insecticide	(a)	Fruit sucking moth
	2. Smoking in orchard	(b)	Coconut black headed caterpillar
	3. Fruit wrapping with paper	(c)	Banana rhizome weevil
	4. Greasy band on tree trunk	(d)	Anar butterfly
	5. Wrapping of aluminum sheet on tree trunk	(e)	Termite
	6. Chemigation	(f)	Rhinoceros beetle
	7. Male Annihilation Technique (MAT)	(g)	Mango mealy bug
	8. Application of insecticides in manure pits	(h)	Mango stem borer
	9. Mechanical control with iron spike	(i)	Cucurbit fruit fly
	10. Cutting of sucker at ground level	(j)	Rodents in orchard crops

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