

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Agriculture
MODEL ANSWER

Semester : VI(New)

Academic Year : 2023-24

Course : ENTO- 365

Course Title: Management of Beneficial

Credit : 2 (1+1)

Insects

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.

SECTION 'A'

Q.1.	<p>Enlist the ideal characteristics of bioagents and describe any three (Enlist : 1 mark, Description : 3 Marks)</p> <table border="0"> <tr> <td>High searching capacity</td><td>Limited host specificity</td></tr> <tr> <td>High reproductive potential</td><td>Adaptation to the environment.</td></tr> <tr> <td>Appropriate host/prey range</td><td>Amenability to insect rearing</td></tr> <tr> <td>Synchrony with host/prey life cycle</td><td>Innate capacity to increase.</td></tr> <tr> <td>Good competitive ability</td><td>Pesticide tolerance.</td></tr> <tr> <td>Ease of economical mass rearing</td><td></td></tr> </table>	High searching capacity	Limited host specificity	High reproductive potential	Adaptation to the environment.	Appropriate host/prey range	Amenability to insect rearing	Synchrony with host/prey life cycle	Innate capacity to increase.	Good competitive ability	Pesticide tolerance.	Ease of economical mass rearing	
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Q.2	<p>What is Apiculture? Describe different castes of honey bee.</p> <p>Apiculture: Practice of keeping bees for commercial production of honey and bee wax. (1 Mark)</p> <p>Discription on three castes viz., Queen, Drone and workers (3 Marks)</p>												
Q.3	<p>Write scientific names, host plants and significance of different types of silkworm reared in India</p> <ol style="list-style-type: none"> Mulberry Silkworm: (<i>Bombyx mori</i>) Host plants: Mulberry (<i>Morus Spp.</i>) Significance: It is only species of silkworm which is reared on large scale. Cocoon easily reelable as single thread. Silk white or creamy in color. Tasar Silkworm (<i>Antheraea mylitta</i>, <i>A. paphia</i>, <i>A. pernyi</i>) Host plants: Asan (<i>Terminalis tomentosa</i>), Arjun (<i>Terminalia arjuna</i>), Ber, Sal Significance: This silkworm cannot be reared in confinement. Caterpillars feed in the open. Silk is brown or coppery in color. Muga Silkworm (<i>Antheraea assamia</i>) Host plants: Som (<i>Machilus bombycina</i>) and Soalu (<i>Litsaea polyantha</i>) Significance: They are polyphagous, semi-domesticated and multivoltine. Cocoon is reelable and brilliant yellow color. Eri silkworm: (<i>Philosamia ricini</i>) Host plants: Castor (<i>Ricinus communis</i>) Significance: Cocoon is unreelable and white in color. 												
Q.4	<p>Write cultivation of mulberry on following points</p> <table border="0"> <tr> <td>1. Soil and climatic requirement</td><td>2. Plantation season</td></tr> <tr> <td>3. Selection of planting material</td><td>4. Mulberry varieties</td></tr> </table>	1. Soil and climatic requirement	2. Plantation season	3. Selection of planting material	4. Mulberry varieties								
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	<p>1. Soil and climate: The soil should be deep fertile, well drained clayey loam. Saline and alkaline soils are not preferred. Mulberry can be grown up to 800 metre MSL, Mulberry can be grown in a rainfall ranged from 600mm to 2500mm.</p> <p>2. Plantation season: Mulberry cuttings can be planted in the month of September-October under irrigated condition. While in rainfed condition, saplings can be planted in the month of April-May.</p> <p>3. Selection of planning material: The mulberry plants are raised from semi-hard wood cuttings. The cuttings are selected from well established garden of 8 - 12 months old. The length of cuttings should be 15 - 20 cm with 3 - 4 active buds.</p> <p>4. Mulberry varieties: (at least 2) Irrigated: S-30, S-36, S-41, S-54, S-1635, JL-1, C-776, TR-10, VR-9, Kanva-2, etc Semi-Irrigated: Kanva-2 and MR-2, etc Rainfed: S-13, S-34, RFS-135, RFS-175 and S-1635, etc.</p>
Q.5	<p>Write short note on (Any two)</p> <p>a) A. Uses of lac : As insulating agent in electrical industry, as coating agent in food industry, coating of medicines in pharmaceutical industry, in paints, varnish and print ink, cosmetic industry, adhesive industry, jewelry and other miscellaneous uses.</p> <p>b) B. Importance of honey bees : Role played by honey bees in pollination and maintaining ecosystem, increasing yield as well as quality of crop, no damage to any crop or plant, producer of honey and bee wax and its value.</p> <p>c) C. Voltinism in silkworm : Number of generations completed in a year is called as voltinism. (Short description on three types of voltinism).</p>
Q.6	<p>Give the mass production techniques for <i>Cryptolaemus montrouzieri</i> -Selection of pumpkin - inoculation with mealybug in acrylic cages -introduction of <i>Cryptolaemus montrouzieri</i> - egg laying- grub rearing- pupation- adult diet for <i>C. Moutrouzieri</i>- Harvesting of beetle</p>
Q.7	<p>Give the importance of beneficial insects in Agriculture. (Description on following points) Insect as pollinators, Insect as weed killer, Insect as biocontrol agent, Insect as scavengers, Insect as producer of commercial products ,Insect as food, Insect as agent of regulating agriculture ecosystem.</p>
Q.8	<p>Enlist important parasitoids commonly used in biological control of crop pests. Give field release technique for <i>Trichogramma chilonis</i>.</p> <p>Important parasitoids with scientific names (at least four) – 2 Marks <i>Trichogramma sp.</i>, <i>Chelonus blackburni</i>, <i>Cotesia (Apentalis) sp.</i>, <i>Bracon sp.</i>, <i>Epiricania melanoleuca</i>, <i>Goniozus nephantidis</i>, <i>Compoletis chloridae</i> etc.</p> <p>Field release technique for <i>Trichogramma chilonis</i>- 2 Marks The parasitoids are released in the pharate stage or when few adults begin to emerge from the host egg during the morning or evening hours. The cards are cut into bits neatly along the grids with least damage to the eggs and stapled beneath the foliage in the upper canopy level. Avoid direct exposure of card to sunlight. To maximize the field parasitization it is recommended to release the parasitoids in as many locations as possible. Avoid application of pesticides at least for 15 days after release of parasitoid.</p>
Q.9	<p>Give the importance of following insect in relation to Agriculture; A. <i>Compoletis chloridae</i>: It is important endo-larval parasitoids parasitizing</p>


		<p>larvae of most of lepidopteran insect. It controls an important polyphagous pest <i>Helicoverpa armigera</i> in cotton, groundnut, chickpea, pigeonpea, sorghum and pearl millet.</p> <p>B. <i>Epiricania melanoleuca</i>: It is important ecto-parasitoid of most destructive pest of sugarcane i.e., sugarcane pyrilla. It parasitizes adult as well as nymphal stages of sugarcane pyrilla.</p> <p>C. <i>Zygogramma bicolorata</i> : It was imported from Mexico in 1983 for the control of Parthenium weed. It help to control the parthenium weed and also found safe to economically important crops.</p> <p>D. <i>Goniozus nephantidis</i> : It is an important larval parasitoid of black headed caterpillar of coconut.</p>
Q.10		<p>Enlist major host plant of lac insect. Give strains and crops of lac insect.</p> <p><u>Major Host Plants:</u> (2 Marks)</p> <p>Palas : <i>Butea monosperma</i> ; Ber: <i>Zizyphus jujuba</i></p> <p>Kusum : <i>Schleichera oleosa</i> ; Khair : <i>Acacia catechu</i></p> <p><u>Strains and crops of lac insect</u> : (1 Mark)</p> <p>Kusumi strain: Two crops</p> <p>A. Jethwi : Duration 6 months (January-February to June-July)</p> <p>B. Aghani : Duration 6 months (June-July to January- February)</p> <p>Rangeeni strain: Two crops (1 Mark)</p> <p>A. Katki: Duration 4 months (June- July to October-November)</p> <p>B. Baisakhi: Duration 8 months (October-November to June- July)</p>
SECTION 'B'		
Q.11	a	Define the following terms
		<p>1. Bee pasturage: The plants from which nectar and pollen are collected by bees .</p> <p>2. Mounting: Process of releasing matured silkworm larvae on chandrikas /mountage for preparation of cocoons.</p> <p>3. Parthenogenesis:Type of reproduction in which females without mating lays unfertilized eggs.</p> <p>4. Scavenger insects: Insects that feed on dead and decaying organisms</p>
Q.12	b	Fill in the blanks
	1	The days when there is no honey flow that period is called as dearth period.
	2	A place where silkworm eggs are produced is called as grainage.
	3	National Bee Board is located at New Delhi.
	4	Scientific name of Mexican beetle is <i>Zygogramma bicolorata</i> .


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