

Department of Zoology
Kisan Veer Mahavidyalaya, Wai (Dist. Satara)

Certificate Course in Sericulture
Year 2019-2020

Course fee : Rs.500/- per student

Course duration : July - August OR August - September

Syllabus

Paper I **Silk moth Morphology, Types and Life Cycle**

1. History of Sericulture
2. Types of Silk moth and relationship
3. Habits and habitat, Morphology and classification of Silk moth
4. Life cycle

Paper II **Rearing and Cultivation of Silk moth**

1. Cultivation of mulberry plant
2. Rearing of silk moth
 - a. Housing
 - b. Feeding and its maintenance
 - c. Disease prevention techniques
 - d. Reeling and raw silk
 - e. Application of sericulture as a cottage industry


Practical

- ❖ Study of stages in life cycle of silk moth
- ❖ Cultivation of mulberry plants
- ❖ Rearing of silk worms
- ❖ Sericulture Economics

Nature of Question Paper: Multiple Choice Questions

Short Answer Questions

Short Notes


RAVINDRA V. BAKARE
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Kisan Veer Mahavidyalaya
Wai - 412704

Department of Zoology
KISAN VEER MAHAVIDYALAYA, VAI
Year: 2019-20

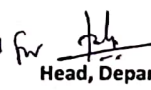
Semester -I, III, V

Class: B.Sc. I, II & III

Sr. No.	Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	07.30 - 08.18						B.Sc. I - ANB/RRT/RRC
2	08.18 - 09.06	B.Sc. II (B) - RVB B.Sc. III - IFP	B.Sc. III - HDK	B.Sc. III - RVB	B.Sc. I - IFP B.Sc. II (B) - RVB B.Sc. II (C) - RRT B.Sc. III - HDK	B.Sc. III - RRT	B.Sc. III - RVB
3	09.06 - 09.54	B.Sc. III- HDK	B.Sc.-II (C) RRC B.Sc. III - RRT	B.Sc. I- RRC B.Sc. II (B) - HDK B.Sc. II (C)-ANB B.Sc. III - IFP	B.Sc. III - RRC	B.Sc. I - HDK B.Sc. III - RVB	B.Sc. III - IFP
4	09.54 - 10.42	B.Sc.-II (C) RRC	B.Sc. I RVB B.Sc. II (B) - IFP			B.Sc. II (B) - IFP B.Sc. III (Seri.)	B.Sc. II (B) - HDK B.Sc. II (C) - RRT B.Sc. III (Seri.)
10.42 - 11.00		R	E	C	E	S	S
5-8	11.00 - 02.12	I - (I+II) - IFP II - (III+IV+VIII) 1. RRT 2. RVB III - HDK	I (IX+X) - RRC II (III+IV+VIII) 1 - ANB 2- RVB III - RRT	I - (V+VI) - ANB II/(V+VI) 1 - RRT 2 - RRC III - RVB	I - (VII+VIII) - RRC II - (V+VI) 1 - RRT 2. ANB III - IFP	I - (III+IV) - IFP II - (I+II+VII) 1 - HDK 2- ANB III - (Seri) - RRC	I - (XI+XII) - ANB II/(I+II+VII) 1 - HDK 2- RRC III - (Seri Pract.) - RRT

IFP: Dr. I. F. Pailwan - 18 RVB: Prof. R. V. Bakare - 18 (B.Sc II Pact- I). HDK: Dr. H. D. Kanase - 18 (B.Sc II, I Pact -II) . RRT: Mr. R. R. Tayade
RRC: Miss. R. R. Chorage ANB: Miss. A.N.Bhilare

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for 
Head, Department of Zoology


Department of Zoology
KISAN VEER MAHAVIDYALAYA, WAI
Year: 2019-20

Semester -II/IV/VI

Class: B.Sc. I, II & III

Sr. No.	Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	07.30 - 08.18						B.Sc. I - RRT
2	08.18 - 09.06	B.Sc. II (B) - RRT B.Sc. III - IFP	B.Sc. III - HDK	B.Sc. III - RVB	B.Sc. I - IFP B.Sc. II (B) - RVB B.Sc. III - HDK	B.Sc. III - RRT	B.Sc. III - RVB
3	09.06 - 09.54	B.Sc. III- HDK	B.Sc. III - RRT	B.Sc. I- RRC B.Sc. II- ANB B.Sc. III - IFP	B.Sc. III - RRC	B.Sc. I - HDK B.Sc. III - RVB	B.Sc. III - IFP
4	09.54 - 10.42		B.Sc. I RVB B.Sc. II (B) - IFP			B.Sc.-II RRC B.Sc. III (Seri.)	B.Sc. II- HDK B.Sc. III (Seri.)
10.42 - 11.00		R	E	C	E	S	S
5-8	11.00 - 02.12	I - (I+II) - IFP II - (III+IV+VIII) 1. RRT 2. RVB III - HDK	I (IX+X) - RRC II (III+IV+VIII) 1 - ANB 2- RVB III - RRT	I - (V+VI) - ANB II(V+VI) 1 - RRT 2 - RRC III - RVB	I - (VII+VIII) - RRC II - (V+VI) 1 - RRT 2. ANB III - IFP	I - (III+IV) - IFP II - (I+II+VII) 1 - HDK 2- ANB III - (Seri) - RRC	I - (XI+XII) - ANB II/(I+II+VII) 1 - HDK 2- RRC III - (Seri Pract.) - RRT

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Department of Zoology
Kisan Veer Mahavidyalaya, Wai (Dist. Satara)

Class: B.Sc. Part – III

Roll No.:

Date:

Time: 11. 30 – 12. 30

Marks: 50

Paper - II

Que: 1 Select correct option and rewrite in the answer book

10

1. The process of killing the cocoon is called.....

- a) Stickling b) Realling c) Rearing d) Spinning

2. The silk thread is composed of five filament of protein called.....

- a) Fibroin b) Tublin c) Histone d) Himoprotein

3. Cocoon is secreted by.....

- a) 1st instar larva b) Pupa c) Vst instar larva d) Imago

4. The full grown mature larva of silkworm is called.....

- a) Caterpillar b) Magot c) Wiggler d) chrysalis

5. In following country all four kinds of Mulberry, Tasar, Muga, and Evi silk is produced.

- a) China b) Japan c) India d) Korea

6. The domesticated silk worm Is one of the best insect for genetic research.

- a) Bombyxmori b) Evi c) Tasar d) none of these

7. Mascardine is a disease of silk moth caused due to

- a) fungi b) bacteria c) insect d) protozoa

8. Following plant is suitable for Bombyxmori feeding.

- a) Mulberry b) Acacia c) Neam d) Mango

9. Pebrine disease is caused by a.....

- a) Protozones b) Bacteria c) Virus d) Fungi

10. Life cycle of silkworm is divided into.....stages

- a) 2 b) 3 c) 4 d) 5

Que: 2. Solve the following.


20

1. Describe the various diseases in silk industry.
2. Describe the different tools used in sericulture.

Que: 3 Write Short Notes on

20

1. Describe Disease Pebrine.
2. Disease Muscardin.
3. Explain worm culture.
4. Grainage management.


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Department of Zoology
Kisan Veer Mahavidyalaya, Wai (Dist. Satara)

Class: B.Sc. Part - III

Time: 10.00 - 11.00

Roll No.:

Marks: 50

Date:

Paper - I

Que: 1 Select correct option and rewrite in the answer book **10**


1. Rearing silk moth for the production of silk is termed as.....
a) Apicultures b) Sericulture c) Prawn culture d) Lac culture
2. Silk moth belong to class.....
a) Insecta b) Mammalia c) Amphibia d) Reptelia
3. The biggest silk producing country in the world is
a) China b) India c) Japan d) America
4. The comments wild silk producing insect is.....
a) Bombyxmori b) Muga c) Tassar d) Eri
5. Humidity is measured by
a) Hygrometer b) Thermameter c) Lactometer d) Milimeter
6. Eri silk moth feeds on plants.
7. Female silk moth lays Eggs.
8. Life cycle of silk moth is completed Days.
9. mouth parts are present in silk worm.
10. Caterpillar of bombyxmori which feeds on.....leaves.
a) Machilas plant c) Custard plant d) Mulberry plant e) Fig plant

Q.2. Answer the following **20**

1. Describe disease cultivation of mulberry
2. Describe morphology of silk moth.

Q.3. Write short notes on **20**

1. Importance of silk
2. Describe types of silk moth
3. Food plant of silk worm
4. Habit and habitat of silk moth


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Department of Zoology
Kisan Veer Mahavidyalaya
Wai, Dist. Satara

JANATA SHIKSHAN SANSTHA'S
**KISAN VEER JUNIOR MAHAVIDYALAYA,
WAI**



Practical Examination in sericulture Examination 201

Class B.Sc - III

Div.

Sub. ZOOLOGY

sect.

Roll No. 93 [2017031605]

Date: 14/3/2020

Signature of the Supervisor:

[Handwritten signature]

10
10

Q.1)

Spot 1:

- i) The given specimen is cacoon of silk moth
- ii) Silkwork changes into pupa inside the cocoon.
- iii) Usually the weight of one ~~cacoon~~ ranges from 1.5 - 2.2 gms.
- iv) The silk is obtained from ~~undamaged~~ cocoon by rubbing the cocoon.

Spot 2:

- i) The given specimen is egg of silkmoth
- ii) The silk moth, lays thousands of eggs
- iii) Silkworm egg hatch & the larvae feed on the mulberry leaves.
- iv) Eggs are covered with gelatinous secretion
- v) It is circular in shape, smaller in size.

Spot 3:

- i) The given specimen is, caterpillar of silkmoth
- ii) Caterpillar of silkmoth is also called as silkworm.
- iii) When caterpillar change into adult, moths they convert themselves in a cocoon of raw silk.
- iv) caterpillar of silkmoth feed continuously
- v) some caterpillars are poisonous.

JANATA SHIKSHAN SANSTHA'S
KISAN VEER MAHAVIDYALAYA, WAI
DIST. SATARA



DEPARTMENT OF ZOOLOGY

Certificate of Attendance

Shri./Miss. Shaikh. Sabir. Inayat

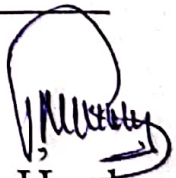
of class B.Sc. Part III Roll No. 93 Examination Seat No. _____

has attended the Study Tour / Local Visit arranged to

visit to the sericulture centre. on 27/1/2020


Teacher In-Charge

Examiner


Head,
Dept. of Zoology

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Date :

SERICULTURE REPORT

Introduction:

Sericulture or silk farming, is the rearing of silkworms for the production of silk. Although there are several commercial species of silkworms.

Bombyx mori, is the most widely-used for & intensively studied silkworm sericulture has become one of the most important cottage industries in a number of countries like China, Japan, India, Korea, Brazil, Italy & France.

Today China and India are the two main producers. Together silkworms larvae are fed by mulberry leaves & after the fourth moult, climb a twig placed near them & spin their silken cocoons.

This process is achieved by the worm through a dense fluid secreted from its structural glands, resulting in their fiber on the cocoon. The silk is a continuous

filament fiber consisting of fibroin protein,

secreted from two salivary glands. In the head of each larva & a gum called sericin, which connects the two filaments together.

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The sericin is removed by placing the cocoons in hot water, which frees the silk filaments and reddish them for reeling. This is known as the degumming process. The immersion in hot water also kills off the silkworm pupae. Single filaments are combined to form thread. This thread is drawn under tension through several guides & wound on to reels.

The threads may be plied together to form yarn. After drying the raw like silk is packed more than 80% of the world production each year.

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OBJECTIVES

1. Sericulture provides suitable silk fibers to the manufacture the various kind of garments.
2. Sericulture is an excellent cottage industry improving the economic status along with the maintainance of environment equilibrium rural areas.
3. Sericulture industry requires low capital investment it can be done with regular farming as a cottage industry.
4. Sericulture industry provides employment for men & women from rural area of different age category.

colours™

Flowers

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STUDY SITE

To study sericulture we have visited district sericulture centre weid on

In this centre the Government officials have provided us very useful information regarding the regarding the cultivation of mulberry rearing techniques of silkworms & ideal conditions required for the better maintenance of the larvae & production of good quality cocoons many farmers from satara district, koregaon, taluka have taken the initiative and involved in silk production along with their traditional farming.

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CULTIVATION

Mulberry is a hardy plant capable of thriving under a variety of agroclimatic conditions plants cultivated by "patla method" (2x3x5) feet & plant population is 100%.

It is also gives 8 metric tons cow dung manure

Only cultivate CSR, certified seeds for planting at the time some it is also sensitive responding extremely well to optimum agricultural inputs & but shows practically no growth when plant nutrients & moisture begin to operate as limiting factors.

This is evident from the fact that under the poor rainfall conditions of 25-30 (525-750mm) prevailing in south India the current leaf yield is of the order of only 3000-3500 kgs. per hectare where as under assured irrigations & appropriate fertilizer application it can be stepped upto 30,000 kgs or so or nearly ten times. Further, mulberry under south Indian conditions unlike in temperature regions like Japan.

India & USSR gives continuous growth almost throughout the year, because of optimum temperature conditions and good sunshine available.

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SOIL AND CLIMATIC CONDITIONS

Mulberry can grow practically on any type of land except on very steep lands. Good growths, however, are obtained when it is raised on their flat land. Mulberry grows in a wide range of soils, but best growth is obtained in loamy to clay cell loam soils. The mulberry plant can tolerate slightly acidic conditions in the soil. In the case of too acidic soils with pH belows. Necessary corrective measures through application of dolomite or lime should be adapted.

In case of alkaline soils, application of gypsum, should be resorted to for correction of the soil mulberry alkalinity. Since mulberry is a deep rooted plant the soil should be sufficiently deep up to about two feet in depth. In respect of elevation mulberry thrives well up to about 4,000 feet. Above growth will be related because of the colder temperature.

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REARING

The silkworm larvae after 12 to 13 days will be segregated into various age groups. The larvae at this stage change body colour at this stage and do not take any food. These worms will be separated & put into a plastic tray, covered with papers and a wire mesh net. The light yellow coloured larvae after taking required amount of feed (after approximately) 10 to 12 days of initiation of larval stage) are ready for cocoon stage are placed on the net. Before placing the cocoons the tray is washed with bleaching powder to protect the worms from infection. The cocoon stage is arrived in 5 days.

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ECONOMY

Sericulture provides a continuous income throughout the year. A economic analysis of mulberry sericulture Farmers was studied cost and return structure from cross-breed (pure mysore \times SR₂) silkworm rearing was estimated. The study has shown that net return from one acre of mulberry worked out to Rs. 52,206 per year. The cost benefit ratio of sericulture was worked out to be significantly higher (1:1.9:4). Detailed study of the economics revealed that the time major economic factor contributing for the total cost in structure was labour which was 32.54%. For silkworm rearing and 13.95%. For mulberry production. Another important item was cost of equipment for silkworm rearing which is about 11.27%.

The possibility of obtaining 1,600 kg of bivoltine cocoon from rearing 4000 layings and by producing 20,000 kg for leaves per hectore. The cost of leaf and cocoon production and net return were estimated, at Rs. 60,0000 Rs. 10,000,00 & Rs. 26,8000,00 resp. Per hectore by using improved techniques.

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GOVERNMENT FACILITIES

A complete system from egg to silkworm production at the village level has been developed and popularized in Maharashtra and Karnataka. Advisory services have also been provided to 400 farmers in Raundi district through the government of Himachal Pradesh for improving their income. More than 250 families with 183 to nurseries plantation, received technical guidance and marketing support in collaboration with the Director of Sericulture, Government of Maharashtra & whose earnings have increased to Rs. 120 lakh per year from Rs 40,000 per year. They produced 59 tons of cocoons which was processed into silk cloth garments & sold through the silk mart outlet at Urali Kanchan. Over 1700 farmers are benefitting from the programme & earnings in the range of 4000 to 28000 from tasar silk and Rs 25,000 to Rs. 3.5 lakh from sericulture.

While generating over 2.7 lakh person days of employment per year 80 landless families in Thane, Pune, Gadchiroli and Bhandara district of Maharashtra are earning

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in the range of Rs 6000 to 30,000 per year through integrated activities such as tasar or silkworm rearing reeling of tasar cocoons, processing of raw silk and weaving of silk fabrics.



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THE STAGES OF PRODUCTION ARE AS

FOLLOWS :-

- 1) The silk moth lays thousands of eggs.
- 2) The silkworm eggs hatch & the larvae feed on the mulberry leaves.
- 3) First, it weaves a net to hold itself.
- 4) Next, it swings its head from side to side in form of the number '8'.
- 5) The silkworm solidifies when it comes in contact with the air.
- 6) The silkworms spin approximately mile of filament & completely encloses itself a cocoon in about two or three days but due to quality restrictions the amount of usable silk in each cocoon is small. As a result, 5500 silkworms are required to produce 1 kg of silk.
- 7) The silk is obtained from the undamaged cocoons by brushing the cocoons to find the outside end of the filament.
- 8) The silk filaments are then wound on a reel. One cocoon contains approximately 1000 yards of



Silkworm Seed Preservation
COLD STORAGE PLANT
NSSO, CSB, HOSUR - 635 126
Regn. No. TN/01/RSP/0013

TEST HATCHING SAMPLE

LOT No. : 89
RACE : D.H
LAID ON :
TREATED ON /
RELEASED ON : 13-1-2019
P.D/H
HATCHED ON : 26-11-2019
% OF HATCHING : 100

SAPTA SRI
Bakambay

JANATA SHIKSHAN SANSTHA'S
KISAN VEER MAHAVIDYALAYA, WAI



DEPARTMENT OF ZOOLOGY
Certificate

This is to certify that, Shri / Smt.....


of class B.Sc. part III has successfully Completed the Self Aided Certificate Course in " Sericulture"
conducted by the Department of Zoology during the academic year 2019-2020.

Head,
Department of Zoology

Principal

Academic Year 2019-20

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किसन वीर महाविद्यालय, वाई
दि. १०/०३/२०२०

सूचना

बी. एस्सी. भाग ३ प्राणिशास्त्र वर्गातील सर्व विद्यार्थ्यांना सूचित करणेत येते की, दि. १४/०३/२०२० रोजी सकाळी १०.३० वा 'रेशीम उद्योग' प्रमाणपत्र कोर्सची लेखी व प्रात्यक्षिक परीक्षा घेण्यात येणार आहे. तरी सर्व विद्यार्थ्यांनी वेळेवर उपस्थित रहावे. यानंतर कोणतीही परीक्षा घेतली जाणार नाही याची सर्वांनी नोंद घ्यावी.

विभाग प्रमुख,


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