

GONDIA EDUCATION SOCIETY'S

MANOHARBHAI PATEL COLLEGE OF ARTS, COMMERCE & SCIENCE

SADAK ARJUNI, GONDIA-441807

(AFFILIATED TO R.T.M.NAGPUR UNIVERSITY)



Cycle-1

**Assessment & Accreditation by
NAAC**

**CRITERION I:
CURRICULAR ASPECTS**

**QnM-1.2.2: Number of Add on /Certificate
programs offered during the last five years**

Gondia Education Society's



Estd. 2009

MANOHARBHAI PATEL COLLEGE OF ARTS, COMMERCE & SCIENCE

SADAK ARJUNI, Dist. Gondia.(Maharashtra) 441807

Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur

E-mail:mbpatelsadakarjuni@gmail.com

Phone (07199) 233224

Ref.No. MBPCI/ ³³⁶ 120222023

Date : 28/02/2023

Declaration

The information, reports, true copies of the supporting documents, numerical data, etc. furnished in this file is verified by IQAC and found correct.

Hence this certificate.

Mr. A. M. Patil
IQAC Coordinator
Manoharbai Patel College
Sadak Arjuni



Dr. A. S. Dwivedi
Chairman IQAC and Principal
Manoharbai Patel College
Sadak Arjuni



Department of Chemistry
Manoharbhair Patel College of Arts, Commerce & Science,
Tal. Sadak Arjuni Dist- Gondia

To,
Hon.. Principal
Manoharbhair Patel College of Arts, Commerce & Science,
Tal- Sadak Arjuni Dist Gondia

Sub: Proposal for Add On Course in "Hands on Chromatographic Technique"

Respected Sir,

With reference to above mentioned subject, the Departments of Chemistry wish to organize a Add-on Course in Chemistry from academic year 2018-2019. The Course duration is of 30 clock hours spread over 15 weeks (2 period per week) course is specially designed for the UG students will participate in the course. A detailed proposal is enclosed herewith this letter we request you to kindly sanction the permission and financial support to conduct course.

Yours Faithfully

Mr. Chandrakant V. Bisen

Department of Chemistry

for, IQAC



Course Proposal:

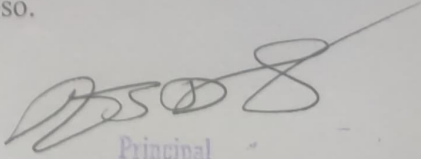
Name of Courses	Add on Courses in “ Hands on Chromatographic Technique” Chemistry
Courses Coordinator	Mr.Chandrakant V. Bisen
Duration	08 Week (total 16 o clock hours , (2 hours per week)
Eligibility	Students do this courses simultaneously with graduation
Fees	Not Required Free

Objectives of the Course:

The Add on course aim to provide additional learner centric graded skill oriented technical training , with the primary objective of improving the employability skills of chemistry students.

The main objectives of the program are:

1. To provide students an understanding of the expectations of industry.
2. To improve employability skills of chemistry students.
3. To bridge the skill gaps and make students industry ready.
4. To provide an opportunity to students to develop inter-disciplinary skills.
5. All the final year students are participated in this course. This course is intended to provide advanced chemistry aspects of programmable. Also, features and applications of chemistry which has the ability to monitor entire system in real time also were discussed. Students participated in this course realized the emerging trends in industry. Topics covered in this course are useful in their academic curriculum also.


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Science**

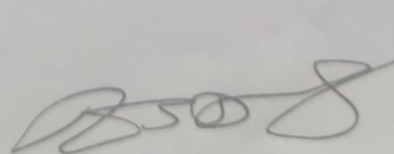
Sadak Arjuni, Dist. Gondia-441807

List of Students of Add on Courses

Department of Chemistry

Year 2018-2019

Sr.No.	Name of Students	Class
1	Kemila Ramesh Chandewar	F.Y.B.Sc
2	Bhagyashri Shankar Chute	F.Y.B.Sc
3	Kusumbai Zalu Fulluke	F.Y.B.Sc
4	Rajni Premlal Bramhankar	F.Y.B.Sc
5	Nita Pyarelal Madavi	F.Y.B.Sc
6	Punam Lehandas Satdeve	F.Y.B.Sc
7	Kajal Vijay Tembhone	F.Y.B.Sc
8	Mahendra Rimlal Parsuramkar	F.Y.B.Sc
9	Divya Suresh Raut	F.Y.B.Sc
10	Sunita Deoram Tarone	F.Y.B.Sc


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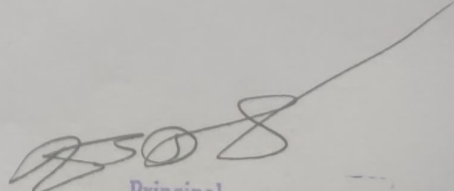


Manoharbai Patel College of Arts, Commerce & Science

Sadak Arjuni, Dist. Gondia-441807

List of Students in Add on Courses Year 2018-2019

Sr.No.	Name of Students	Class
1	Kemila Ramesh Chandewar	F.Y.B.Sc
2	Bhagyashri Shankar Chute	F.Y.B.Sc
3	Kusumbai Zalu Fulluke	F.Y.B.Sc
4	Rajni Premlal Bramhankar	F.Y.B.Sc
5	Nita Pyarelal Madavi	F.Y.B.Sc
6	Punam Lehandas Satdeve	F.Y.B.Sc
7	Kajal Vijay Tembhone	F.Y.B.Sc
8	Mahendra Rimlal Parsuramkar	F.Y.B.Sc
9	Divya Suresh Raut	F.Y.B.Sc
10	Sunita Deoram Tarone	F.Y.B.Sc


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Dist. Gondia - 441807



Time Table for Add on Courses Students

Year 2018-2019

Department of Chemistry

Theory Time Table

Sr.No	Time (Morning)	Mon	Tue	Wed	Thu	Fri	Sat
		BSC III	BSC III	BSC III	BSC III	BSC III	BSC III
1	8.00 to 8.50	--	--	--	--	--	--
2	8.50 to 9.40	CVB	RNH	--	--	--	--
3	9.40 to 10.30	--	--	--	--	--	--
4	10.30 to 11.20	--	--	--	--	--	--

CVB : Mr. Chandrakant V. Bisen

RNH: Mr. Ramdas N. Huse

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Add On Course Content (Syllabus) 2018-19

Principles of Chromatography

Chromatography is a separation method where the analyze is combined within a liquid or gaseous mobile phase. This is pumped through a stationary phase. Usually one phase is hydrophilic and the other lipohilic. The components of the analyte interact differently with these y-two phases. Depending on of their polarity, they spend more or less time interacting with the stationary phase and are thus retarded to a greater or lesser extent. This leads to the separation of the different components present in the sample. Each sample component clutes from the stationary phase at a specific time, its retention time. As the components pass through the dctor their signal is recorded and plotted in the form of a chromatogram.

Types of Chromatography

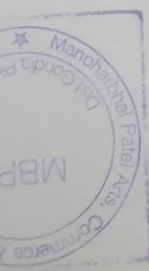
The four main types of chromatography are

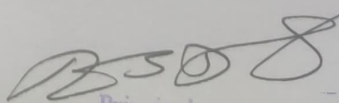
1. Adsorption Chromatography

In the process of adsorption chromatography, different compounds are adsorbed on the adsorbent to different degrees based on the absorptivity of the component. Here also, a mobile phase is made to move over a stationary phase, thus carrying the components with higher absorptivity to a lower distance than that with lower absorptivity. The main types of chromatographic techniques that are used in industries are given as under.

2. Thin Layer Chromatography

In the process of thin-layer chromatography (TLC), the mixture of substances is separated into its components with the help of a glass plate coated with a very thin layer of adsorbent, such as silica gel and alumina, as shown in the figure below. The plate used for this process is known as chrome plate. The solution of the mixture to be separated is applied as a small spot at a distance of 2 cm above one end of the plate. The plate is then




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placed in a closed jar containing a fluid termed as an eluent, which then rises up the plate carrying different components of the mixture to different heights

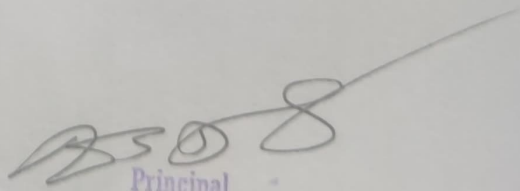
3. Column Chromatography

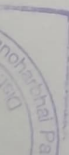
Column chromatography is the technique used to separate the components of a mixture using a column of suitable adsorbent packed in a glass tube, as shown in the figure below. The mixture is placed on the top of the column, and an appropriate eluent is made to flow down the column slowly.

Depending upon the degree of adsorption of the components on the wall adsorbent column/tube separation of the components takes place. The component with the highest absorptivity retained at the top, while the other flow down to different heights accordingly.

4. Partition chromatography

In this process, a continuous differential partitioning of components of a mixture into a stationary phase and mobile phase takes place. The example of partition chromatography can be seen in paper chromatography. In this process, chromatography paper is used as a stationary phase which is suspended in a mixture of solvents that act as a mobile phase. Here, we put a spot at the base of the chromatographic paper with the mixture to be separated and as the solvent rises up this paper, the components are carried to different degrees depending upon their retention on the paper. The components are thus separated at different heights.


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Manoharbai Patel College of Arts, Commerce & Science

Sadak Arjuni, Dist. Gondia-441807

Department of Chemistry

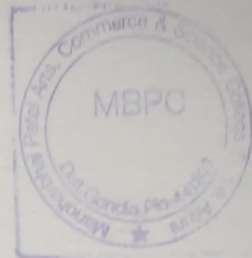
Attendance Register

Add on Courses 2018-2019

Theory/practical

Sr. No.	Name Of Student	Date		Signature																																	
		Lecture Delivered																																			
1	Kemila Ramesh Chandewar	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
2	Bhagyashri Shankar Chute	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
3	Kusumbhai Zalu Fulluke	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
4	Rajini Premal Bramhankar	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
5	Nita Pyarelal Madavi	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
6	Punam Lehandas Satdave	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
7	Kajal Vijay Tembume	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
8	Mahendra Rimlal Parsuramkar	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
9	Divya Suresh Raut	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>
10	Sunita Deoram Tarone	01/18	1	<i>Bis</i>	02/18	1	<i>Bis</i>	03/18	1	<i>Bis</i>	04/18	1	<i>Bis</i>	05/18	1	<i>Bis</i>	06/18	1	<i>Bis</i>	07/18	1	<i>Bis</i>	08/18	1	<i>Bis</i>	09/18	1	<i>Bis</i>	10/18	1	<i>Bis</i>	11/18	1	<i>Bis</i>	12/18	1	<i>Bis</i>

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**Manoharbai Patel College of Arts, Commerce &
Science**

Sadak Arjuni, Dist. Gondia-441807

Class: B.Sc. III

Subject: Chemistry

Time: 30 min.

Mark: 20

Add on Course Test Paper

2018-19

Note: 1) All questions are compulsory.

Date: 04/09/2018

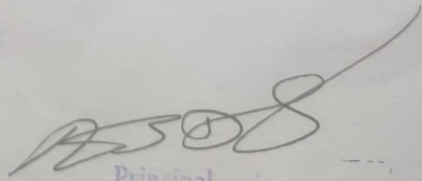
2) All questions are MCQ

1. Chromatography is a physical method that is used to separate _____

- (a) Simple mixtures
- (b) Complex mixtures
- (c) Viscous mixtures
- (d) Metals

Answer:

2. Which force is involved in the Chromatography ?


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- (a) Hydrogen bonding
- (b) London force
- (c) Electric static force
- (d) All of the above

Answer:

3. Ion exchange chromatography is based on the _____

- (a) Electrostatic attraction
- (b) Electrical mobility of ionic specie
- (c) Adsorption chromatography
- (d) Partition chromatography

Answer:

4. Chromatography with solid stationary phase is called _____

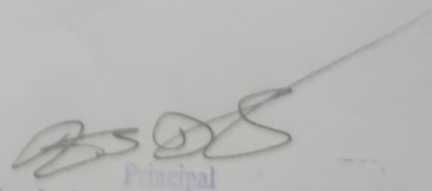
- (a) circle chromatography
- (b) Square chromatography
- (c) solid chromatography
- (d) adsorption chromatography

Answer:

5. A combination of paper chromatography and electrophoresis involves

- (a) Partition chromatography
- (b) Electrical mobility of the ionic species
- (c) Both (a) and (b)
- (d) None of these

Answer:


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6. The pattern on the paper in chromatography is called

- (a) chroming
- (b) Chroma
- (c) Chromatograph
- (d) Chromatogram

Answer:

7. In reverse phase chromatography, the stationary phase is made

- (a) Non-polar
- (b) Polar
- (c) Both a and b
- (d) None of these

Answer:

8. The components which have a small value of K have an affinity for

- (a) mobile phase
- (b) stationary phase
- (c) no phase
- (d) solution

Answer:

9. Which technique is also known as colour writing ?

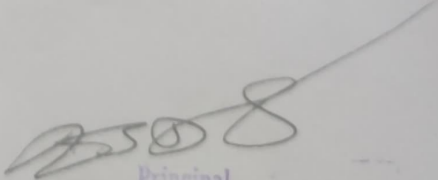
- (a) NMR
- (b) Mass spectroscopy
- (c) Chromatography
- (d) All of the above

Answer:

10. Which of the following HPLC detectors is used as a bulk property or general purpose detector?

- (a) Electrochemical detector
- (b) Fluorescence detector
- (c) UV-Visible detector
- (d) Evaporative Light scattering detector

Answer:


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Manoharbai Patel College of Arts, Commerce & Science

Sadak Arjuni, Dist. Gondia-441807

Department of Chemistry

Progress Report for Add On Course

Academic Year : 2018-2019

“Hands on Chromatography Technique”

An Add on course "Hands on Chromatography technique" started in the department of chemistry from academic year 2018-19. Every year 10 deserving students are admitted to course. Students participating in course are benefitted in their recruitment in chemical industry and laboratory. This course also helps them increase their awareness about pharmaceutical and chemical industrial knowledge.

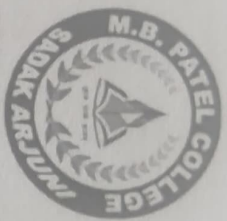
In academic year 2018-19, 10 students sought admission in the course from July to October. The continued as two lectures were scheduled per week. After completion of the course certificate were issued and feedback from student was collected.

Yours Faithfully

Asst. Prof. C. V. Bisen

Add on Course Co-ordinator

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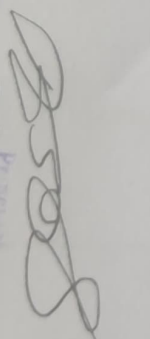


Gondia Education Society's
M. B. PATEL ARTS, COMMERCE & SCIENCE COLLEGE, SADAK ARJUNI

CERTIFICATE

This is to certify that _____ student of _____ has enrolled and successfully completed the add on course in chemistry Entitled "**Hands On Chromatography Technique**" organized by the Department of Chemistry during academic year 2018 - 2019.


Coordinator


Principal
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& Science College, Sadak Arjuni,
Dist. Gondia, Pin Code - 441807





Manoharbai Patel College of Arts, Commerce & Science

Sadak Arjuni, Dist. Gondia-441807

Analysis Report

Feedback on "Hands on Chromatography Technique" Add on Courses 2018-2019

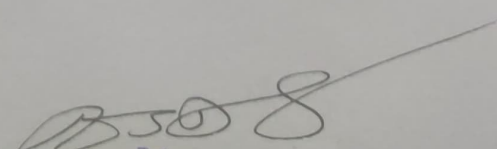
Department of Chemistry

Name of Add on Course: Hands on Chromatography Technique.

Subject: Chemistry

Number of students filled in feedback form: 10

Sr. No	Index	Strongly Agree	Agree	Partially Agree	Disagree	Strongly Disagree
1	Current syllabus is good for skill development and employability	90%	10%	—	—	—
2	It increases social awareness moral values	80%	20%	—	—	—
3	It enhance thirst for learning and helps in overall personality development	80%	20%	—	—	—
4	It fulfills the demands of higher education	90%	10%	—	—	—
5	It promote environmental awareness and cultural harmony	80%	20%	—	—	—
6	Its objectives are clearly achieved	70%	20%	10%	—	—
6	It promotes research ability	80%	20%	—	—	—
7	It represent social scenario	90%	10%	—	—	—


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Manoharbhai Patel College of Arts, Commerce & Science

Sadak Arjuni, Dist. Gondia-441807

In Collaboration with

Gokul Nursery and Sericulture Farm Ukara Fata, Sakoli

SYLLABUS

Sericulture Rearing

and

Domestication of silkworm Varieties

(Effective from 2019-2020)

Principal
Manoharbhai Patel Arts, Commerce
& Science College, Sadak Arjuni
Dist. Gondia, Pin Code-441807.



To,

The Principal

Manoharbhai Pate College of Arts, Commerce
& Science College Sadak Arjuni, Dist- Gondla

Subject –Proposal for Certificate Course in “Sericulture Rearing and Domestication of Silkworms Varieties ”

Respected Sir,


We wish to start certificate course in “ **Sericulture Rearing and Domestication of Silkworms Varieties** ” it is in collaboration with Gokul Nursery And Sericulture Farms Ukara Fata , Sakoli .This. Course has been especially designed for poor and needy students of the College being offered free of cost as a benevolent gesture by Gokul Nursery And Sericulture Farms Ukara Fata ,.

A detailed Proposal is enclosed herewith this letter we request you to kindly sanction the permission to Conduct Course.

Thanking You.

Yours Faithfully


(Dr. V.K. Sangode)


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& Science College, Sadak Arjuni
Dist-Gondla, Pin Code-341807.



Manoharbai Patel College of Arts, Commerce & Science
Sadak Arjuni, Dist. Gondia-441807

COURSE PROPOSAL

Name of The Course : **Sericulture Rearing and Domestication of silkworm Varieties**


Course Coordinator : Dr. V. K. Sangode (Assistant Professor)

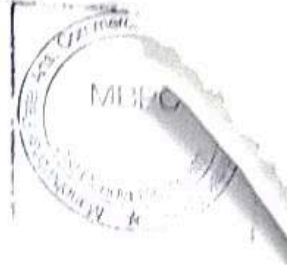
Duration : 1 January 2019 to 31 March 2019

(1 days per week)

Total Students : 12

Total Hours : 24 Hrs.


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Dist.Gondia,Pin Code 441807.



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Sadak Arjuni, Dist. Gondia-441807

Time table

Year: 2019-2020

(1 Days in a week/ 4 Classes in Month)

Time: 2 Hours

Sr. No.	Day	Time
1	Wednesday	2.00 -5.00 pm
2	JAN / FEB/MAR	12 CLASSES

Principal
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& Science College, Sadak Arjuni
Dist.Gondia,Pin Code-441807.

MANOHARBHAI PAILE COLLEGE OF ARI, COMMERCE & SCIENCE, SADAKARJUNI
SADAK ARJUNI, DIST. GONDIA (MAHARASHTRA) 441807
Attendance Sheet Sericulture Rearing and Domestication of Silkworm Varieties Field Report

Course Name : B.SC. - 5 SEM

Sr No.	Student Id	NAME	ENROLLMENT NO
1	2835234	TARKESH GOWARDHAN BHURE	2012016600 0570437
2	2822346	TILOTTAMA MADHUSUDAN MESHARAM	2015016600497266
3	2838110	RAKESH DULICHANDKORE	2015016602296744
4	2835265	BHUMESHWAI HANWATDONODE	20173074203933
5	2834474	CHANDANI MARKANDUKEY	20173074203934
6	2834999	DIPALI HIVINDRAKUMARRAUT	20173074203940
7	2834485	JAYSHREE SUKRAMCHAUDHARI	20173074203945
8	2835181	RIMA NARESHNAGRIKAR	20173074203981
9	2838092	SAKSHI HIRALALMESHARAM	20173074203984
10	2835196	SONALI CHANDRASENKPARGATE	20173074203992
11	2837273	SWATI BABURAOMATALE	20173074203994
12	2834978	SWITI BHAGWANDASRAUT	20173074203995
13	2837503	VISHAKHA ARUN KORE	20173074203996
14	2822782	SUNITA RAMKRUSHNASAYAM	2018107150
15	2838133	ANJALI RAJKUMARSHENDE	2018107420 2392
16	2837422	BHUMESHWARI RAMUDHANBHATE	2018107420 6122
17	2837267	CHETNA PRAMOD IRALE	20181074206131 6128


 Name of the student
 Date of the report


 Name of the teacher

MANOHARBHAI PATEL COLLEGE OF ARTS, COMMERCE & SCIENCE, SADAKARJUNI
 SADAK ARJUNI, DIST. GONDIA (MAHARASHTRA) 441807
 Attendance Sheet Sericulture Rearing and Domestication of Silkworm Varieties Field Report



Course Name : B.S.C. - 5 SEM

Sr No. Id	Student NAME	ENROLLMENT NO	2/1/19	9/1/19	30/2/19	6/2/19	13/2/19	24/3/19	6/3/19
1	2835234 TARKESH GOWARDHAN BHURE	2012016600 0570437	P	P	P	P	P	P	P
2	2822346 TILOTTAMA MADHUSUDAN MESHARAM	2015016600 497266	P	P	P	P	P	P	A
3	2838110 RAKESH DULICHANDKORE	2015016602 296744	P	P	P	P	P	P	P
4	2835265 BHUMESHWAI HANWATDONODE	2017307420 3933	P	P	P	P	P	P	P
5	2834474 CHANDANI MARKANDUIKEY	2017307420 3934	P	P	P	P	P	P	P
6	2834999 DIPALI HIVINDRAKUMARRAUT	2017307420 3940	P	P	P	P	P	P	P
7	2834485 JAYSHREE SUKRAM CHAUDHARI	2017307420 3945	P	P	A	P	P	P	A
8	2835181 RIMA NARESH NAGRICKAR	2017307420 3981	P	P	P	P	P	P	P
9	2838092 SAKSHI HIRALAL MESHARAM	2017307420 3984	P	P	P	A	P	P	P
10	2835196 SONALI CHANDRASEN KARGATE	2017307420 3992	P	A	P	P	P	A	P
11	2837273 SWATI BABURAO MATALE	2017307420 3994	P	P	P	P	A	A	P
12	2834978 SWITI BHAGWANDAS RAUT	2017307420 3995	P	P	P	P	P	A	P
	2837503 VISHAKHA ARUN KORE	2017307420 3996	P	P	P	P	P	P	P
4	2822782 SUNITA RAMKRUSHNA SAYAM	2018107150 2392	P	P	P	P	P	P	P
	2838133 ANJALI RAJKUMAR	2018107420 6122	P	P	P	P	P	P	P

2/1/19 Jan
 9/1/19
 30/2/19 Feb
 6/2/19
 13/2/19
 24/3/19 Mar
 6/3/19 Sessic

Manoharbai Patel
 & Science College
 Dist. Gondia, Dist.

**Value Added Courses
Sericulture
Semester- I**



GENERAL SERICULTURE AND BIOLOGY OF SILKWORM

Unit-I : General Sericulture

1. History of Sericulture
2. Geographical distribution of various species and economic races of silkworms.
3. Systematic position of mulberry, tasar, eri and muga silkworm.
4. Distribution of mulberry and non- mulberry silkworms.

Unit-II : Present status & distribution

1. Present status of sericulture industry in India.
2. Morphology of various stages of mulberry silkworm.
3. Morphology of various stages of non-mulberry silkworms
4. Problems and prospects of Sericulture in India.

Unit-III : Morphology of Silk gland of mulberry and non-mulberry silkworms

1. Morphological structure of silk gland of mulberry silkworm
2. Morphological structure of silk gland of non mulberry silkworm
3. Histological structure of silk gland
4. Development of silk gland

Unit- IV: Silk synthesis

1. Biosynthesis of Silk
2. Types of silk protein and constituents of silk
3. Effect of exogenous and endogenous factors on silk synthesis.
4. Role of environmental conditions on silk gland development

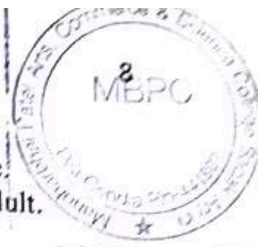
Principal
Manoharbhaj Patel Arts, Comme

REFERENCE BOOKS

1. Handbook of Practical Sericulture : Ullal, S.R. and Narasimhamma, M.N. (1987), Central Silk Board Publications, Bangalore.
2. T.R. of Tropical Sericulture : (1975), Publ., Japan Overseas Corporation Volunteers.
3. FAO Manuals on Sericulture : Anonymous (1972), Vol. I-IV
4. Sericulture for Rural Development : Hanumappa (1978), Himalaya Publication, Delhi.
5. The Silkworm, an Important Laboratory Tool : Tazuma, Y. (1978), Kodansha Publications, Tokyo.
6. Control of Silkworm Reproduction, Development and Sex : Strumnikov, V.A. (1983), MIR Publications, Moscow.
7. Tassar Culture : Joly, M.S. Sen, S.K. and Absan M.M. (1974), CSTRI, Ranchi.
8. Ericulture in India : Sarkar, D.C. (1988), CSB, Bangalore.
9. Annual Report of the Central Sericulture Research and Training Institute, Mysore.
10. Annual Report of the Central Silk Technological Research Institute, Bangalore.
11. Annual Report of Central Tassar Research Institute, Ranchi.
12. Annual Report of Muga Research Institute, Assam.
13. General Text Book of Entomology : Inms, A.D. (1961), Edn. 9 Rev. By O.W. Richards & R.G. Davis.
14. Text Book of Comparative Endocrinology : Gorman, A. & Bern, H. (1974), Wiley Eastern Pub. Delhi.
15. Insect Physiology : Wigglesworth, V.B. (1956) Edn. 5, Rev. Methven, London.
16. Insect Hormones: Novak, V.L.A. (1985), Chapman and Hall, London.
17. Insect Structure and Function : Chapman, R.R. (1985) ELBS Publ. New Delhi
18. An Introduction to Sericulture : Ganga, G. and Chetty, S.J. (1997), 2nd Edition, Oxford and IBH Publishing Co. Ltd., New Delhi.
19. Principles of Sericulture : Hisao Aruga, Oxford and IBH Publishing Co. Pvt. Ltd., New Dell.
20. Modern Entomology : Tembhare, D.B. (1997), Himalaya Publishing House, Bombay.
21. Handbook of Muga Culture : Thangavelu, K. et. Al. (1988) CSB Publication, Bangalore.
22. General Entomology : Mani, M.S. (1994), Oxford & IBH Pub. Co. Pvt. Ltd., Delhi.
23. General and Applied Entomology : Nayar, K., et. al., (1995), Tata McGraw-Hill, Pub., New Delhi.
24. Principles of Insect Morphology : Snodgrass, R.C. (1970), Tata McGraw-Hill, Pub. Co. Bombay.
25. A Text Book of Insect Morphology, Physiology and Endocrinology : Tembhare, D.B. (1984), S. Chand and Co. New Delhi.
26. Text Book of Applied Entomology : Vols. I and II. Srivastava, K.P. (1983), Kalyani Publishers, Ludhiana/.

Practical-I : Biology of Silkworms and Host Plants

1. Identification of different types of silkworms.
2. Morphology of egg larva, pupa and adult of different silkworm types.
3. Life history of different silkworm types.
4. Dissection of digestive system of larva, pupa and adult, study of salivary gland.
5. Dissection of circulatory system of the larva, pupa and adult silkworm.
6. Dissection of the nervous system of larva and adult silkworm.
7. Dissection of reproductive system in the adult silkworm types.



8. Study of the silkworm cuticle : Abrasion test and chitosan test.
9. Study of the digestive enzymes; amylase, invertase, trehalase, lipase and protease.
10. Haemocyte types and their counts (Total and differential) in the larva and adult. (Reproductive Biology of Silkworm and Silkworm Biology-II)
11. Anatomy and histology of reproductive organs of silkworm.
12. Gametogenesis; Histological preparation of spermatogenesis and oogenesis.
13. Preparation and mounting of different embryonic stages of silkworm.
14. Study of retrocerebral complex of the silkworm.
15. Histomorphology of endocrine glands of the silkworm.
16. Study of the enzymes during metamorphosis : acid and alkaline phosphatase and beta glucuronidase.
17. Study of the moisture loss during larval and adult stages.
18. Demonstration of the uptake of dyes by the Malpighian tubules of larval stages and adult.
19. Demonstration of the uric acid in the Malpighian tubules.
20. Histological preparations of the various parts of: Digestive system, reproductive system, excretory system and silk glands of the Mulberry silkworm.

DISTRIBUTION OF MARKS

1. Dissection	...	...	...	...	...	...	15
2. Identification of silkworm cocoons (1-5)...	...	...	...	...	...	...	10
3. Identification and comments on given spots (1-10)	...	...	...	...	...	...	20
4. Physiological Experiments	...	...	...	...	...	...	10
5. Permanent stained slide preparations	...	...	...	...	...	...	05
6. Submission of permanent Slides, Tour Diary	05
7. Class Record	05
8. <i>Viva voce</i>	10
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9. Internal Assessment	20
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TOTAL MARKS	100

BIOLOGY OF MUGA AND ERI SILKWORM HOST PLANTS

Unit-I : Arboriculture (Muga)

1. Distribution and present status.
2. Morphology of host plants; Som (*Machilus bombyciana*), Soalu (*Litsaea polyantha*).
3. Taxonomy of host plants; Som (*Machilus bombyciana*), Soalu (*Litsaea polyantha*).
4. Anatomy of leaf, stem and roots of host plants

Unit -II: Intercultivation and management

1. Climate, soil conditions and manuring.
2. Types of Propagation methods
3. Intercultivation and pruning and their management.
4. Physiology of Mineral nutrition, Photosynthesis, Respiration, Growth regulators, Photoperiodism, Transpiration

Unit-III : Arboriculture (Eri) :

1. Distribution and present status
2. Morphology of host plants; Castor (*Ricinus communis*), Kesseru (*Heteropanax fragrans*)
3. Taxonomy of the plants; Castor (*Ricinus communis*)

4. Anatomy of leaf, stem and roots of host plants

Unit –IV: Intercultivtion and management

1. Climate, soil conditions and manuring.
2. Methods of Propagation and cultivation
3. Intercultivation and methods of pruning.
4. Physiology of Mineral nutrition, Photosynthesis, Respiration, Growth regulators, Photoperiodism, Transpiration

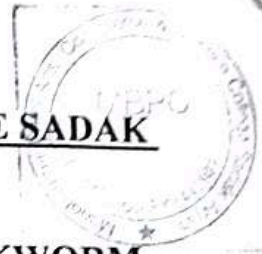


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1. **A text book of Sericulture** : Mohan Rao, M.M. (1988), B.S.P. Publications, Sultan Bazar, Hyderabad.
2. **Mulberry Cultivation** : (1988) FAO Pub . By Oxford & IBH Publishing Co. Pvt . Ltd., New Delhi.

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MB PATEL COLLEGE OF ARTS COMMERCE AND SCIENCE SADAK
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SERICULTURE :REARING AND DOMESTICATION OF SILKWORM
MULTIPLE CHOICE QUESTION

Time Allowed : 45 MIN

Full Marks : 20

All questions carry equal mark of 1 each.

Attempt all questions.

- Which country is the largest producer of raw silk?
(a) Japan (b) India
(c) China (d) South Korea
- India occupies the _____ position in production of raw silk in the world.
(a) 2nd (b) 3rd
(c) 4th (d) 5th
- Maximum raw silk produced in India is :
(a) Bivoltine silk (b) Multivoltine silk
(c) Univoltine silk (d) Trivoltine
- Which state is the largest producer of raw silk in India?
(a) Tamil Nadu (b) Andra Pradesh
(c) Karnataka (d) West Bengal
- What is Vanya silk?
(a) Vanya silk is produced by non-mulberry silkworms
(b) Eri silk
(c) Raw silk
(d) Oak tasar silk
- Which state is the leading raw silk producer in India?
(a) Tamil Nadu (b) Karnataka
(c) Andra Pradesh (d) West Bengal
- Which country is producing all the four commercial silk in the world?
(a) India (b) China
(c) South Korea (d) Japan
- Muga silk is produced only in :
(a) India (b) Bangladesh
(c) Pakistan (d) Myanmar
- Define Sericulture.
(a) Sericulture is the science that deals with the production of raw silk by rearing of silkworms.
(b) Silk culture
(c) Silkworm rearing

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10. More than _____ % of the raw silk production in India is mulberry silk.
- (a) 80 % (b) 87 %
(c) 89 % (d) 77 %
11. What is ants well?
- (a) It is the seat of rearing rack
(b) Alluminium bowl
(c) It is a device to prevent ants from entry into the rearing racks containing rearing tray.
(d) Plastic mug
12. The scientific name of Mulberry silkworm is :
- (a) Bombyx mori (b) Bombyx mandarina
(c) Bombyx rotundapex (d) Bombyx incomposita
13. Philosamia ricini is the scientific name of :
- (a) Eri silk worm (b) Muga silkworm
(c) Oak Tasar silkworm (d) Mulberry silkworm
14. Out of the four variety of silkworms which one is the only monophagus in nature.
- (a) Mulberry silkworm (b) Muga silkworm
(c) Eri silkworm (d) Oak tasar
15. In Orissa Tropical Tasar is mainly fed on _____ leaves.
- (a) Sal (b) Arjun
(c) Ber (d) Janum
16. Explain polyphagus insects?
- (a) Insects (including silkworm) that feed on more than one food plants.
(b) Multi food plants
(c) Muga silkworm only
(d) Mulberry silkworm only
17. Silkworm undergoes _____ moulting.
- (a) two (b) three
(c) four (d) five
18. _____ symptoms are intersegmental membranes of the body which becomes swollen and the skin becomes shiny.
- (a) Flacherie (b) Muscardine
(c) Grasserie (d) Pebrine
19. What is Voltinism?
- (a) Voltinism is the number of generation in a year
(b) One generation in a year
(c) Two generation in a year
(d) Number of moulting in a year
20. What is fecundity?
- (a) Number of eggs laid by muga moth (b) The number of eggs laid by a single moth
(c) Number of eggs laid by eri (d) Number of eggs laid by mulberry



Gondia Education Society's
M. B. PATEL ARTS, COMMERCE & SCIENCE COLLEGE, SADAK ARJUNI

CERTIFICATE

This is certify that _____ student of _____
has participated in Add on course Entitled Sericulture Rearing and Domestication of
Silkworm varieties organized by the Department of Zoology in collaboration with Gokul
Nursery and Sericulture Farm during academic year __ 2019 - 2020 _____

Coordinator

Head of the department

Principal