Star-DBT Report
2018-19

1. Name of the College: K. J. Somaiya College of Science and Commerce, Vidyavihar, Mumbai-400077

2. Name of Departments Supported:

Name of Coordinator, designation, address, phone nos.

Department	Name of Coordinator	Designation	Address	Phone Number
Biochemistry	Dr.Ketan Ranade Ms.Saeema Khan	Assistant Professor	Dept. of Biochemistry,	9322660738 9867572823
Botany	Dr.Ketan Thatte Dr.Meena Patankar	Assistant Professor	Department of Botany,	7045074240 9619975792
Chemistry	Dr.Vanita Kulkarni Dr.Nishamol Kanat Dr.Rohitsingh Chauhan Dr.Aniket Pawanoji	Assistant Professor Assistant Professor Assistant Professor Assistant Professor	Dept. of Chemistry,	7506122478 8452821977 9320870781 9821176760
Microbiology	Mrs.Hemlatha Chakraborty Dr.Lolly Jain	Associate.Professor Assistant Professor	Dept.of Microbiology	9867208239 9819914206
Physics	Dr.Jitendra Pendharkar Mrs.Smita Survase	Assistant Professor Assistant Professor	Dept. of Physics	9820177087 9220898269
Zoology	Ms.Shreya Patil	Assistant Professor	Dept.of Zoology	9967004379

3. No. of Regular Faculty with Ph. D. in each participating Department :

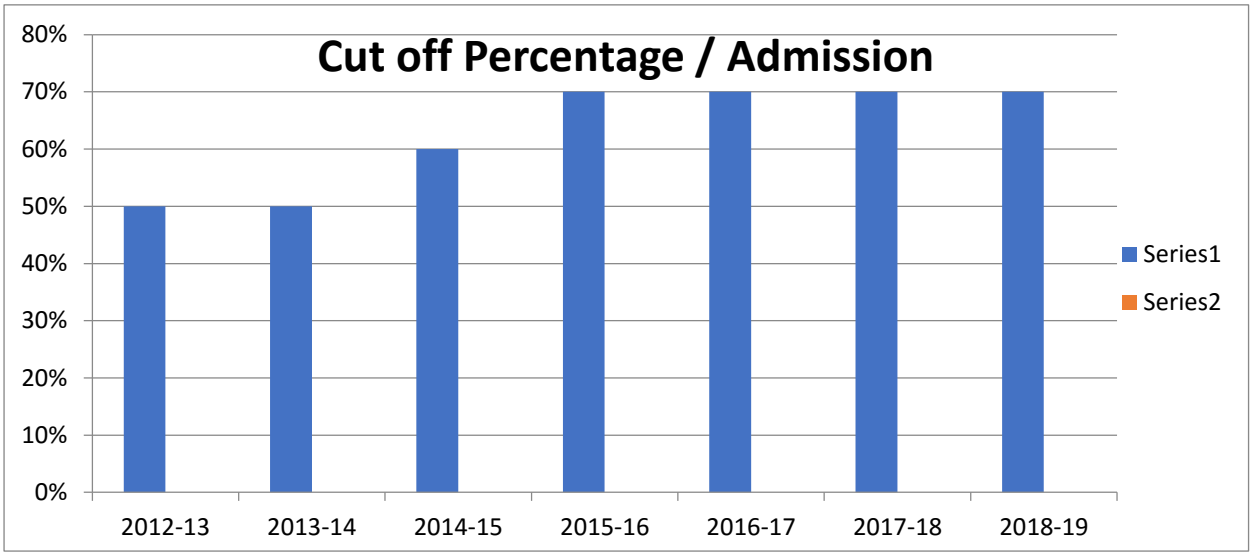
Department	Total No. of regular Faculty	No. of Faculty with Ph.D
Biochemistry	04	03
Botany	07	04
Chemistry	23	18
Microbiology	07	05
Physics	13	05
Zoology	07	04

4. **List of courses (B.Sc./M.Sc./PG Diploma, certificate etc) run by different participating departments :**

Sr. No.	Department	Courses
1.	Biochemistry	B.Sc., M.Sc
2.	Botany	B.Sc, M.Sc., Ph.D.
3.	Chemistry	B.Sc,, M.Sc., Ph.D.
4.	Microbiology	B.Sc,, M.Sc., Ph.D.
5.	Physics	B.Sc, M.Sc.
6	Zoology	B.Sc,, M.Sc., Ph.D.

5. Cut off percentage for admission in different courses in participating Departments, positions in university, percentage of result in 2009-10 academic session :

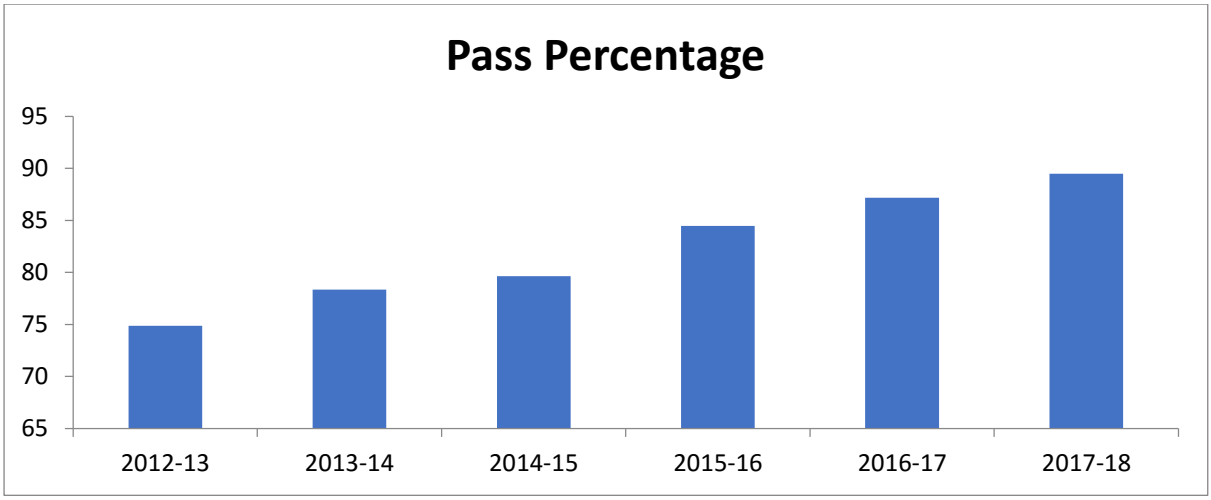
CLASS	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
FYBSC	50%	50%	60%	70%	70 %	70%	70%



Percentage Results

T.Y.B.Sc result :

Year	Pass Percentage
2012-13	74.87
2013-14	78.35
2014-15	79.63
2015-16	84.48
2016-17	87.17
2017-18	89.47



6. **List of Projects undertaken by students, industrial visits by students, summer training in last one year :**

Botany

Dissertation / Projects			
Number of the students involved	Class	Title of Project	Duration
4	SYBSc.	Anatomical and phytochemical analysis of some mangrove plants collected from Ratnagiri.	01 Month
2	SYBSc.	Phytochemical screening of gum exudate of *Auracaria.*	02 weeks
5	FYBSc.	Microscopy of *Ageratum, Vinca* and *Vernonia*.	01 month
5	TYBSc.	Estimation of alcohol produced from fruit waste using *Saccharomyces cerevisiae*	03 Months
1	SYBSc.	Isolation of pigments from fresh leaves of *Tectona grandis*.	01 Month
4	TYBSc.	Preparation of paper from fruit waste.	02 Months
5	FYBSc.	Role of two fungal species in biodegradation of pineapple waste.	01 Month
1	TYBSc.	Study of Air purifying plants commonly used in household.	02 weeks
4	TYBSc.	Model of Landscape architecture of formal garden	01 Month
12	TYBSc.	Start-up counters of small scale fruit processing industry.	06 Months

FYBSc, SYBSc, and TYBSc. Students	Seed bank Continuation of projects since 2016	ongoing

44 Students of TYBSc started with following Projects :

- Start-up counters for Small Scale Industry which includes making of handmade pots, Pickles, Jams, dry herbs and Kokedema.
- Display of different types of garden
- Nursery development and sell under start-up counter as small scale industry

Projects done by TYBSc (20) students:

Sr. No.	Name of Students	Title of the project
1	Kshitija Shrungare Neha Kothari Aziz Shaikh Narayan Dash	Time to grow vertically- Hydroponics
2	Yogesh Sarvankar Kruti Kaneriya Shivam Khillari Krishna Chandra	To Measure the growth of *Brassica juncea* at different wavelengths of light.
3	Bidisha Mandal Bushra Shaikh Swarnalata Panda Surabhi Sawant Tehreem Khan	Survey- Awareness about menstrual cup among college girls.
4	Prachi Padaya Rahul Ghodke Gautam Chedda Sayali Prajakta Palve	Diseased train- Measurement of microbial growth in train compartments of Mumbai suburban.
5	Akshit Shah Pankaj Yadav Monali Kadam	Magical growth

	Pratiksha Jadhav	

Social Awareness:

- Swachh Bharat Abhiyan: 20 students of TYBSc Botany were enrolled for Swachh Bharat Abhiyan internship from 15 June 2018 to 31 August 2018.

  Students have contributed 100 hours for various social activities conducted at Nareshwadi Ashram School and Dhundalwadi, Dist. Palghar, Maharashtra. Students were engaged in social responsibilities for three months. They have initiated seed bank project and plantation drive at Dhundalwadi

  - Following are the activities conducted under Swachh Bharat Abhiyan
    - Door to Door meeting
    - Survey-questionnaire
    - Rain water harvesting
    - Preparation of Herbal hand wash
    - Recycling of clothes & papers
    - Water filter
    - Awareness about plastic
    - Wall painting
    - Employment generation
    - Sanitation
    - Health & Hygiene
    - Green cover- kitchen garden
    - Seed bank

Industrial Visit

Visit to Institute / Industry		
Student Class	Name of Institute / Industry	Duration / Date
T.Y.B.Sc -40 S.Y.B.Sc-33 Faculty - 4	Regional Ayurveda Institute for Fundamental Research, Kothrud and Division of Mushroom Cultivation, Dept. of Green House Technology-Mahatma Phule Krishi Vidyapeeth, Rahuri, Pune branch, Pune	11th Dec.2018.
S. Y. B. Sc.- 53 Faculty - 4	Keshav Srushti, Bhayander, Mumbai	7th July 2018
T. Y. B.Sc.- 24 Faculty - 3	Godavari Biorefinary, Godavari Distillery, Division of Biofertilizers, Co-gen at Sameerwadi, Karnataka and ICMR-National Institute of Traditional Medicine, Belgaum	31st January 2019 to 6th February 2019

Training/ Internship

Name of Student	Class	Name of Institute / Industry	Title of Project	Duration / Date
Sayali Palvankar Prajakta kale Prachi Padaya	TYBSc. TYBSc. TYBSc.	Centre for Environment Education and Development, CBD- Belapur	Tree census at CBS Belapur and Godrej	01 Month
Tanmay Dave Vaishnavi Dalvi Elma Malik Shreya Pandey	SYBSc.	WWF- India	Ek Prithvi Project-Educating Children in BMC Schools	1 year
Krishna Chandra Saloni Shinde Khan Tehreem Shruti Pagare	TYBSc.	WWF- India	Ek Prithvi Project-Educating Children in BMC Schools	1 year
Fatema Nalwala	TYBSc.	U Farm Internship	Micrograin and lettuce grown hydroponically	Started from January 2019

Chemistry Projects

No. of students	Class	Name of the Project	Duration in months
4	T. Y. B. Sc.	Synthesis of Rayon Fibers	June- Sept 15
4	T. Y. B. Sc.	Determination of Chloride Content in Water samples –Mohr's Method	June- Sept 15
4	T. Y. B. Sc.	Determination of Chloride, Sodium and Potassium Content in Well water samples	June- Sept 15
4	T. Y. B. Sc.	Synthesis and Applications of Hydantoin	June- Sept 15
4	T. Y. B. Sc.	Determination of amount of Chlorophyll in Spinach	June- Sept 15
4	T. Y. B. Sc.	Preparation of Synthetic Dyes	June- Sept 15
4	T. Y. B. Sc.	Synthesis of Chalcones	June- Sept 15
4	T. Y. B. Sc.	Synthesis of Polymers- Glyptal	June- Sept 15
4	T. Y. B. Sc.	Synthesis of Methyl salicylate from Aspirin	June- Sept 15
4	T. Y. B. Sc.	Synthesis of n-Butyl Acetate	June- Sept 15
4	T. Y. B. Sc.	Synthetic Food Dyes and Natural Dyes	June- Sept 15
4	T. Y. B. Sc.	Synthesis of drugs- Quinoxaline	June- Sept 15
4	T. Y. B. Sc.	Synthesis of Azodyes- Para Red	June- Sept 15
4	T. Y. B. Sc.	Determination of formula of Copper ammonium Complex – Partition Coefficient method	June- Sept 15
4	T. Y. B. Sc.	Preparation of Quinoxaline and AST Testing	June- Sept 15
4	T. Y. B. Sc.	Synthesis of Anthraquinone	June- Sept 15
4	T. Y. B. Sc.	Soap Making	June- Sept 15
4	T. Y. B. Sc.	Testing of Fastness of Dyes	June- Sept 15
4	T. Y. B. Sc.	Detection of Calcium and Fluoride in Toothpaste	June- Sept 15
4	T. Y. B. Sc.	Determination of Shapes of Atomic Orbitals Using Quantum Mechanical Concepts	June- Sept 15

4	T. Y. B. Sc.	Conversion of Waste plastic into Fuel	June- Sept 15
4	S.Y.B.Sc.	Determination of the formula of zinc ferric cyanide complex.	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of Anhydride of Dicarboxylic acid	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of schiff's base or imines	Jan – Mar 15
4	S.Y.B.Sc.	Salt Hydrolysis for NH_4Cl: Determining hydrolysis constant and degree of hydrolysis for NH_4Cl	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of organic derivative: To Prepare p-iodonitrobenzene from p-nitroaniline	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of 2-methylbenzimidazole from o-phenylenediamine	Jan – Mar 15
4	S.Y.B.Sc.	To prepare 2- Methylbenzimidazole from O- Phenylenediamine	Jan – Mar 15
4	S.Y.B.Sc.	Coumarin Synthesis: Resorcinol to 7-hydroxy-4-methyl coumarin	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of ligand schiff base and schiff base metal complexes	Jan – Mar 15
4	S.Y.B.Sc.	Synthesis of hydantoin	Jan – Mar 15
4	S.Y.B.Sc.	To study Diels alder reaction	Jan – Mar 15
4	S.Y.B.Sc.	To study and understand Biginelli reaction	Jan – Mar 15
4	S.Y.B.Sc.	To study and understand Knoevenagel reaction	Jan – Mar 15
4	S.Y.B.Sc.	Quantitative estimation of Proteins in pulses by biuret method.	Jan – Mar 15
4	S.Y.B.Sc.	pH dependance of anthocyanin	Jan – Mar 15
4	S.Y.B.Sc.	Synthesis of dyes and their applications	Jan – Mar 15

4	S.Y.B.Sc.	To study and understand Schotten-Baumann Reaction	Jan – Mar 15
4	S.Y.B.Sc.	Formation of crystals	Jan – Mar 15
4	S.Y.B.Sc.	To study and understand Coupling Reaction	Jan – Mar 15
4	S.Y.B.Sc.	Synthesis of paracetamol from p-aminophenol	Jan – Mar 15
4	S.Y.B.Sc.	Synthesis of Biodiesel	Jan – Mar 15
4	S.Y.B.Sc.	Generation of electricity using vinegar	Jan – Mar 15
4	S.Y.B.Sc.	Formation of phenol formaldehyde and urea formaldehyde	Jan – Mar 15
4	S.Y.B.Sc.	Synthesis of aspirin	Jan – Mar 15
4	S.Y.B.Sc.	Determination of percentage yield of Garlic oil from garlic clove	Jan – Mar 15
4	S.Y.B.Sc.	To discuss the uses of ZnO and estimate the amount of Zn present in given sample of talcum powder by complexometric titrations	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of paracetamol	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of Bakelite	Jan – Mar 15

Interdisciplinary Projects

No. of students	Class	Name of the Project	Duration in months
4	T. Y. B. Sc.	Determination of Caffeine content from Plant Based Compounds, Synthetic medicines, food and beverages. (Chemistry- Nutraceutical)	June- Sept 15
4	T. Y. B. Sc.	Estimation of Chlorophyll content in common medicinal Leaves and health benefits of chlorophyll	June- Sept 15
4	T. Y. B. Sc.	Extraction of dyes from Purple Cabbage	June- Sept 15
4	T. Y. B. Sc.	Water Analysis Using Antibiotics Discs By Disc Diffusion And Spread Plate Method	June- Sept 15
4	T. Y. B. Sc.	Preparation of 2,3-diphenyl quinoxaline and 5-nitro salicylic acid and Testing their susceptibility on gram positive and gram negative organisms.	June- Sept 15
4	T. Y. B. Sc.	Determination of Oxalate Content in guava fruit at different stages of ripening	June- Sept 15
4	S.Y.B.Sc.	Soil analysis: Parameters: pH , Electrical conductivity , Organic carbon content, Bulk Density	Jan – Mar 15
4	S.Y.B.Sc.	Preparation of Benzilic acid and determination of its antimicrobial activity	Jan – Mar 15
4	S.Y.B.Sc.	Using Excel for Graphical Analysis of Data	Jan – Mar 15
4	S.Y.B.Sc.	Quantitative Estimation of Protein content in pulses using Biuret method.	Jan – Mar 15
4	S.Y.B.Sc.	Determination of vitamin C content in different fruit juices	Jan – Mar 15
4	S.Y.B.Sc.	Determination of Fermentation rate in juices	Jan – Mar 15
4	S.Y.B.Sc.	Determination of pH using red cabbage as an indicator	Jan – Mar 15
4	S.Y.B.Sc.	Analysis of Chlorophyll in green medicinal plants	Jan – Mar 15

FYBSc Project

To understand the nature of safety required to handle the chemicals in the laboratory, our F.Y.B.Sc. Students have prepared Material Safety Data Sheet (MSDS) of all chemicals used in laboratory. Total 100 students were benefited by this activity.

1) No of students involved : 100
2) Chemicals studied : 500
3) No.of students benefited : All the 700 students working in Chemistry Laboratory

Student Exchange Programme

Bro. Shubham Biswal (SYBSc) has been selected to participate in the U.S. government funded exchange program titled 'FY 2018 Study of the U.S. Institute for Student Leaders on Global Environmental Issues' hosted by the University of Montana, in Missoula, Montana, USA in July and August, 2018.

Rasayan: Departmental Chemistry festival

- Theme: Polymer
- No of the Events: 08
- Total participants: 200
- No of participants from other colleges : 80

Rasayan Events:

- **Brain-O-Philia** - A quiz event
- **Catenation** – Formation of Chemical structure by students
- **Infinity-Hunt** - A treasure hunting game based on skills and knowledge of chemistry
- **Photo-K-Mystery** - Photography event based on knowledge of Chemistry
- **@Reactive-Poster** - A poster making event.
- **3rd Dimension** - A model making event
- **KISMAT**-Chemistry element Housie game

Industrial/institute visit by students

Number of Beneficiaries	Class	Name of the institute/industry	Duration/Date
70 + 4 faculty	T.Y.BSc.	Bombay Rayon Textile Industry Nipra Packaging	5th January 2019
70 + 5 faculty	T.Y.B.Sc.	Forensic Science Laboratory	6th February 2019
110 + 5 faculty	T.Y.BSc.	Bhabha Atomic research centre	16th February 2019

Microbiology:

Title of the Project	Name of Students	Class	Faculty Supervisor
"Battle for disinfectant between FUN-TERIA (Fungus & Bacteria)"	Isha Popat Tanvi Patel Preeti poojary Bhakti Narsale Bhagyshree Mundaye Zhera sayyed Arwa mujpurwala Shruti Patil	F.Y.B.Sc	Dr. Rashmi Thakur
Goodbye Acne	Shreya Mane Sanyukta Mishra Isha Raikar Sakshi Mav Shruti Kenjale Maryam Nawab Priya Prajapati	F.Y.B.Sc	Dr. Rashmi Thakur
Battle of decomposition	Prajwal dhumal Amey bait Rasika borade Amreen khan Shaziya khan Ankit jaiswal Jainam jain	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal
Kya aapke toothpaste me antimicrobial property hai?	Siddhesh Desai Shubham Mourya Shaikh Hera Divya Chauhan Manju Yadav Nipunya	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal
Tie & dye	Kasturi chavan Krina Gandhi Akanksha Desai Ashni Jakhariya Samruddhi chaudhari SarveshJain Aditi Chavan Kanchan chauhan Yesvi amal	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal
Thugged by shampoos	Shreeya naik Amisha Panchal Prachi sonawane Vikrant bhoir Zainab fatima Iqra Memon Pratik Chavan Suditi Desai	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal

Get more with milk	Anshika Gandre Rucha Phondke Nirmiti Pachanekar Shraddha kadam Payal Bhanushali Tejas Kalaskar	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal
Dye degradation by isolated thermophile.	Ninad Achrekar Chetana Jishi Neha Gupta Falgunee Bodke Akshay Kadam Rushikesh Kadam	S.Y.B.Sc	Mr. Shabib Khan
Isolation, Characterization of Pigment Producing Bacteria from soil and it's Applications.	Dimple Anand Gautam Pooja Jawale Dakshata Achrekar Sneha Bhagat Komal Gohil	S.Y.B.Sc	Mr. Shabib Khan
Antimicrobial activity of guava leaves.	Vidhi Baria Aniket Bonte Payal Chauhan Ashwini Kandula Neha Khond	S.Y.B.Sc	Mr. Shabib Khan
Microbial Analysis and Characterization of different street selling Schezwan chutney.	Falaknaaz Khan Tashmi Kadam Priya Kahar Komal Joshi	S.Y.B.Sc	Mr. Shabib Khan
Detection of presence of microbial load on electrical devices.	Pranali Pranaykumar Pednekar Anjali Lalit Singh Neha Hariram Prajapati Neha Anil Takke Pratik Harishankar Tripathi PV Sidharth	S.Y.B.Sc	Dr. Unnati Padalia
Reusability of nutrient medium.	Shreya Nair	S.Y.B.Sc	Dr. Unnati Padalia
Isolation of microorganisms from local pani-puri samples on different culture media.	Apeksha Kumari Patel Greeshma Nair Shruti Nadgir Kajal Pangam Akshada Bodke	S.Y.B.Sc	Dr. Unnati Padalia
Growth of different microbial cultures using different dilutions of nutrient agar and broth.	Divya Nikumb Mayuri Parab	S.Y.B.Sc	Dr. Unnati Padalia
Effect of different carbon sources on the growth of antimicrobial producing Bacillus species in nutrient broth composition.	Mayuri Parab	S.Y.B.Sc	Mr. Shabib Khan

Interdisciplinary Projects

Minor project	Name of student	Class	Name of supervisor	Department
Plant devils	Rushali Jadhav Sakshi Gangurde Shraddha Kambare Niyati Bhanushali Meet Hurbada Namrata Bhadra Sayali Ghag Divya Gujar Jui Kalap Bijal Vikamasi	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal Dr. Ajit Katdare	Microbiology Botany
Know soil Know life	Shifa Sayyed Sana Sayyed Saurabh Pawar Murtuza Patangwala Akshay Maskar Saloni Sawant	F.Y.B.Sc	Dr. Rashmi Thakur Dr. Vanita Kulkarni	Microbiology Chemistry
Fascinating Fungi	Krusha Shah Anam shaikh Aditi puthane Kajal gupta Raj Vora	F.Y.B.Sc	Dr. Lolly Jain Ms. Varsha Pegwal Dr. Jitendra Pendharkar Dr. Ajit Katdare	Microbiology Physics Botany

Summer training:

10 students of F.Y.B.Sc have applied for the Summer training under Project oriented Biology Education -2019 (POBE-2019), Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.

- Students of F.Y.B.Sc attended the National Science Day event at Tata Institute of fundamental Research, Colaba on 24th February 2019 at TIFR.

Names of the Students: Samruddhi Chavan, Tanvi Patel, Isha Popat, Suditi Desai, Iqra Menon, Krusha Shah, Kajal Gupta, Manju Yadav

Visit To Ankur Theme Park, Enviro-Vigil, Kalwa, Thane :

Date: 05th January, 2019

Venue: Ankur-Theme Park, Enviro-Vigil, Kalwa Thane.

Number of students attended: 52

Number of teachers supervised the Event:01

Students of S.Y.B.Sc. Microbiology visited Ankur-Theme Park, Enviro-Vigil, Kalwa Thane. Students were given a brief presentation on Biomedical Waste Management, followed by a display of a video for the same. Students were taken to the site of Biomedical Waste Management, where they observed how the bio-medical waste is collected from different hospitals in Thane district, labelled and processed. Students then observed different Medicinal plants and their significant applications in daily life. Students were then shown Vermicomposting method, its technique and applications followed by Biogas method to deal with domestic waste segregation and management. Students also observed rain water harvesting and different simple techniques to handle, segregate domestic waste in different innovative ways like Magic Bucket etc. Students could observe how vermi-wash is collected, processed and sold. Students were motivated to work for environmental issues and projects on the same. Mr. Shabib Khan organized the visit and accompanied the students.

Physics

Sr. No.	Title of the Project	Students Names	Faculty Supervisor	No.of Beneficiaries
1	Tesla Coil	Siddique Kaneez Fateema, Khan Farheen	Dr.Deepak More	2
2	Automatic smart parking	Suranmaye Sahu Nishat Kamat Amrutha Iyer	Dr.Jitendra Pendharkar	3
3	CHUA's circuit	Shruti Patel, Supriya Patra Tanuja Jangannawar , Jyothaika	Ms.Smita Survase	4
4	Health Parameter Sensor	Sagar Mahendra, Harsha Nandu, Siraprasad W. Anand Jaiswal	Dr.Pallavi Raote	4
5	Automatic aligning system	Shweta Sharma, Anuja Ghadi, Niranjan Jadhav, Chintan Patel	Dr.Geeta Nair	4

6	AM-FM modulator	Vrushanka Kumakar, Samruddhi Menge, Ashish Patel, Ashish Nikam	Mr.Amit More	4
7	Reflectometer	Akash K, Faizan	Dr.Pallavi Raote	2

Visit to Institutes / Industries

Sr.No	Institute/ Industry visited	Date	No.of beneficiaries
1	Geomagnetic center, Alibaug	21st August 2018	53 students + 3 faculty
2	Night Sky gazing at Patil farm, Asangaon	5th January 2019	31 students + 3 faculty
3	BARC	1st March 2019	21 students + 4 faculty

Zoology

Title of the Project	Name of Student	Class	Faculty Supervisor	Beneficiary no.
Study of Behaviour of terrestrial gastropod - *Macrochlamys indica*	Revati Vispute	TYBSc	Ms. Shreya Patil	1
Study of diversity of Tardigrades in samples collected from local ponds	Vidhi Rathod	TYBSc	Ms. Shreya Patil	1
Study of lifecycle of Barnacle along South Mumbai coast	Shruti Joshi	TYBSc	Ms.Shreya Patil	1
Study of Insects, Birds and Reptile Biodiversity in Tungareshwar Wildlife Sanctuary	Manan Mehta Prathmensh Amberkar Chinmay Nikam	SYBSc	Dr. Amol Patwardhan	3
Study of bacterial load from different water samples collected in college premises	Tanmay Dave	SYBSc	Ms. Madhuri Padaya	1
Survey of birds in lake areas in Thane city	Tejali -630 and Snehal - 635	FYBSc	Dr. Amol Patwardhan	2

Study of adulteration in chilli powder obtained from different sources	Shweta -614 and Nisha -615	FYBSc	Ms Aarti Damle	2
Study of status of animals in Jijamata Udyan, Byculla	Mohini - 595, Shrutika 632, Maya 637, Uma 638, Aysia 640	FYBSc	Ms. Shreya Patil	5
Study of alcohol brewing from fruit juice and fruit waste	Shrutesh 624 and Abhishek 612	FYBSc	Dr. Shanti Upadhye	2
Preparation of permanent slides of different types of scales in fishes	Shrutika 654, Anushka 652, Minal 669, Pratiksha 664	FYBSc	Dr. Amol Patwardhan	4
Comparative study on Quantitative Estimation of DNA from different samples	Pallavi 596, Anamika 594, Ruchi 613, Riddhi 601	FYBSc	Ms. Shreya Patil	4
Effect of caffeine on heart rate of daphnia using Redbull and coffee	Shubham 604 , Rohit 588, Manish 593, Sheetal 609, Umesh 622	FYBSc	Ms. Madhuri Padaya	5
Development of database of insects found in college campus	Piyush 602, Meet 599, Krunal 591, Deepak 592	FYBSc	Dr. Amol Patwardhan	4
Production of organic manure from kitchen waste	Dhyanvi 620, Tanuja 589, Shruti 590, Ayushi 598	FYBSc	Mr. Ajay Tripathi	4
Study of effect of glucose on developing of chick embryo	Pritanksha 625, Saroj 626, Sakina 611, Nishba 603, Mohini 619	FYBSc	Ms. Shreya Patil	5

Interdisciplinary Projects

Minor project	Name of student	Class	Name of supervisor	Department	Beneficiary No.
Effect of electric current on *E.coli* growth curve	1. Kinnari Joshi 2. Abhishek 3. Hritik 4. Mangesh	FYBSc	1. Dr. Shanti Upadhye 2. Dr. Jitendra Pendharkar	1. Zoology 2. Physics	4
Comparative study of Phoraminiferan shells of various beaches of Mumbai and Konkan	1. Tanmay Dave	SYBSc	1. Ms. Shreya Patil 2. Dr. Jyoti Sharma	1. Zoology 2. Geology	1

Three students of MSc part II Zoology (sp Oceanography) (B.Sc. Students of our college who worked under star DBT project) were selected under MoU signed between KJ Somaiya College of Science and Commerce and Hemchandracharya North Gujarat University for student exchange and collaborative research.

- Miss Bharati Desai:

Title: Study of anthropogenic pressure on the distribution and burrow morphology of the brachyuran crab Dotilla blanfordi of the mudflats of Gujarat and Maharashtra

Field work done on selected beaches of Gujarat, Mumbai and Raigad coasts

Dotilla burrows were identified and resin casts were made of random burrows from the upper middle and lower zones of the beach.

Quadrat method was used to cover 9 quadrats over 3 line transects to check for burrow density

Visitors and vehicular count was taken per hour to check for anthropogenic activity on the beach

Statistical analysis was used to check for correlation between the burrow architecture and anthropogenic pressure.

- Mr Jaivansh Somaiya:

Title: Study of Biochemical composition of the commercially important brachyuran crab, Scylla serrata collected from North-western coast of Gujarat

The parameters tested were the content of protein, carbohydrate, lipid and moisture in the body and claw muscle harvested from the crab. Samples were collected from 7 sites from Gujarat as well as Maharashtra.

- Mr Rishiraj Dughal:

Title: Study of biochemical composition of the Mudskipper, Boleopthalmus dussumieri.

Parameters like morphometric, protein, carbohydrate, lipid and moisture content is analysed.

The samples were collected from 8 sites (5 from Gujarat, 3 from Maharashtra)

Field Visits:

Sr.No.	Title	Beneficiaries	Date
01	Excursion to Matheran	TYBSc - 24	13th July, 2018
02	Excursion to Godrej Mangrove	TYBSc - 25	18th July 2018
03	Excursion to Tungareshwar Wildlife Sanctuary	SYBSc - 47	7th August 2018
04	Konkan Krishi Vidyapith, Dapoli	SYBSc - 30	3 - 4 Dec 2018

05	Harne fish landing centre	SYBSc - 30	3 - 4 Dec 2018
07	NIO – Goa , Bondla Wildlife Sanctury and backwaters	TYBSc - 24	4th Jan – 8th Jan 2019

7. Training received by Faculty From Participating Departments.

Botany

Name of faculty	Name of the Activity conducted	Date
Mrs.Supriya Janbandhu	Workshop at Lala Lajpat Rai College on Green wall	31st August,18
Mrs.Supriya Janbandhu	Workshop at ICT on phytochemistry "Extraction and isolation of phytoconstituents	8th and 9th Dec.18
Dr.Meena Patankar	Workshop at ICT on phytochemistry Extraction and isolation of phytoconstituents	8th and 9th Dec.18
Mrs.Supriya Janbandhu.	Biodiversity Conclave "My Earth 2050- Sustainable Habitats for Co- Existence''K.C college	5th and 6th Feb19
Dr Ajit Katdare	Workshop on RBPT at KJSSC	22nd to 24th November 2018
Dr. Meena Patankar	Workshop on RBPT at KJSSC	22nd to 24th November 2018
Dr. Veena Salvi	Workshop on RBPT at KJSSC	22nd to 24th November 2018
Dr. Ketan Thatte	Induction programme at IISER, Pune	1st May to 28th May 2018

Chemistry

- Science Teachers Congress was attended by Dr. Vanita Kulkarni from Chemistry Department at Lucknow from 5th to 8th October 2018.
- Three staff members (Dr. Vanita Kulkarni, Dr. Saurabh Shete, Dr. Aniket Pawanoji) attended workshop in Chemistry organized by Homi Bhabha Centre for Science education and Research (HBCSE)

Microbiology

- Dr. Soniya Shetty attended Workshop on Mendelian Genetics conducted by Department of Biotechnology, KJSSC
- Dr.Unnati Padalia, Associate Professor attended the workshop on Flow Cytometry on 2nd February, 2019 at Somaiya Vidyavihar organised by Flow cytometry Solutions in association with SIRAC and Sathgen Biotech.

Physics

Sr.No.	Name of the faculty	Theme of the course	From (Date) To (Date)	Venue
01	Ms Ranjana Shukl	ICT (ID) : Effective use of ICT in Science Education	24th to 13th Oct 2018	D. G. Ruparel College, Mumbai (HRDC, Mumbai)
02	Ms.Ranjana Shukl, Dr. Meena Sharma, Dr.Deepak More, Dr. Geeta Nair, Ms. Smita Survase, Dr. Pallavi Raote, Dr. Rucha Naik. Mr. Ketankumar Gayakwad Dr. Shruti Barve	Moodle workshop organised by IIT Bombay	15th March 2019	KJSCEIT, Mumbai

- Science Teachers Congress was attended by Mrs.Smita Survase from Physics Department at Lucknow from 5th to 8th October 2018.

Zoology

- Ms. Shreya Patil and Ms. Aarti Damle attended one day Workshop conducted by IIT Bombay on Moodle at KJ Somaiya College of Engineering, Vidyavihar, through the project PMMNMTT, funded by Ministry of Human Resource Development, Govt of India.
- Mr. Ajay Tripathi attended Workshop on Mendelian Genetics conducted by Department of Biotechnology, KJSSC

8. List of exhibitions/Seminars/training courses conducted by College

Biochemistry

Sr. No	Name of Resource person	Designation	Host Institute	Duration	Programme and its date	No. of student Beneficiaries
1.	Dr.S.M.Pawaskar Dr.Heena Shah Dr.Ketan Ranade	Head, Dept of Biochemistry Assistant Professor, Dept of Biochemistry Assistant Professor, Dept	K.J.Somaiya College of science and commerce	6 days	"Swatcha Bharat-Swastha Bharat" Abhiyan from 24th September 2018 to 29th September 2018	30

	Mrs.Saeema Khan	of Biochemistry Lecturer, Dept of Biochemistry				
2	Dr.S.M.Pawaskar Dr.Heena Shah Dr.Ketan Ranade Mrs.Saeema Khan	Head, Dept of Biochemistry Assistant Professor, Dept of Biochemistry Assistant Professor, Dept of Biochemistry Lecturer, Dept of Biochemistry	K.J.Somaiya College of science and commerce	2 days	"Health Fair 2019".on 12th and 13th January 2019. Conducted at Inorbit mall vashi	76
3.	Chef Sonali Thakur	Pastry chef,	Hyatt Regency, Mumbai	1 day	Workshop by on healthy cooking on 22nd January 2019	70
4	Mrs. Yogita Narvekar	Technical expert and proprietor		1 day	A workshop on electrophoresis 10th December, 2018	45

Botany

Exhibition	Shravanatlya Bhajya.	20/08/18	15
Exhibition	Air purifying plants.	9th and 10th Jan 2019	04
Departmental Fest (Inter collegiate)	VRUKSHAM with events such as seed art Garland making, Zayka, Jugad, poster making.	9th and 10th Jan .2019	300 +

Number of Beneficiaries	Resource person/ Institute	Title of Workshop	Duration / Date
S.Y.B.Sc -02 T.Y.B.Sc -08	Mr.SachinRane. Member, NaturalisT Foundation	Kokedama	10/08/18
S.Y.B.Sc -02 T.Y.B.Sc -11	Chef Feroz Khan Khan Fruit Carving Academy	Fruit and vegetable carving	11/08/18
S.Y.B.Sc -03 T.Y.B.Sc -16	Mr.SachinRane. Member, NaturalisT Foundation	Bonsai	14/08/18
T.Y.B.Sc (25) + 1 Faculty from R J College, Ghatkopar	Dr.DnyandaSalvi Mr.Siddharth Kshatriya	Geo tagging of Plants	10/01/19
T.Y.B.Sc -33	Dr.Jitendra Pendharkar	RBPT workshop	13/02/19

Chemistry

230 (students) + 9 faculty	Workshop on safety measures	28th June 2018 – 2nd July, 2018
118 students + 2 faculty	workshop conducted on Chemsketch Draw for T.Y.B.Sc Students	23rd -27th July, 2018
191 Students + 3 faculty	Stereochemistry Workshop	22nd February 2019
118 students + 3 faculty	Spectroscopy Workshop	25th February 2019
49 Non-teaching staff	WRIC workshop for laboratory maintenance and repair for Non-teaching staff	13 -16th February 2019
337 students At 6 Schools	Students outreach program (Detection of Food Adulterants)	15th Jan to 25th March 2019

<u>Workshop on Laboratory Maintenance in collaboration with WRIC (organised by Chemistry & Physics Department)</u>

A workshop on laboratory maintenance was jointly organized by the Departments of Physics and Chemistry of K.J.Somaiya College of Science and Commerce from 13 -16th February 2019. This workshop was conducted in collaboration with Western Regional Instrumentation Center (WRIC), Mumbai University under the Star –DBT Scheme.

The workshop aimed at providing hands on training to the non- teaching faculty on repair and maintenance of the laboratory equipment**.**

The workshop was conducted under the convenorship of Ms. Ranjana Shukl and Dr. Vanita Kulkarni with the able support of committee members. It saw the participation of 49 candidates from the host college and also various colleges in Mumbai and suburbs. The resource persons from WRIC namely Mr. N. N. Rao, Ms. Sunita Batra, Ms. Sarita Thopte, Mr. Sudhir Kumar, Mr. Govind Chitte, , Mr. Milind Shidruk, Ms. Asmita Newaskar, Mr. Devendra Gunde , aptly guided the participants. About 150 apparatus were repaired during the course of the workshop. This included CROs, power supply, microprocessor kits, microscopes, spectrophotometer, colorimeter, pH meter, balance etc.

The workshop was very useful with the participants actively interacting with the resource persons and "learning by doing". Overall the workshop was a huge success and achieved the objective with which it was planned.

Microbiology

Workshop on Biostatistics- Insilico

The Department of Microbiology had organized a two-day workshop under DBT Star College Scheme.on 'Biostatistics- Insilico' on 1st and 2nd August 2018. The resource person was Prof. Nitin Wasnik, Assistant Professor, Department of Zoology, D.G. Ruparel College, Matunga. The workshop was organised by Mrs. Soniya Shetty.

The first session was a general explanatory session on the introduction and importance of biostatistics in various fields. The speaker explained the different terminologies, types of graphs, formulae for calculations as used in an excel sheet. The afternoon session was a hands-on session where students learned to use excel for making graphs and statistical calculations.

The second day was devoted to learning about various statistical tests like chi square test, f-test , ANNOVA, variance and much more. The morning session was a theoretical one while the afternoon was a practical session. Students learnt to create hypothesis and to prove them. They also took up the actual case studies for solving.

It was a very interactive and useful workshop and was very well received by the students. It was hugely appreciated by the students as was seen from the feedback given by them.

Workshop on: ‘Let’s Do Research- RBPT way’

The One day workshop on ‘Let’s do Research- RBPT way’ was organized on 23rd December 2018 from 10.00 am to 3.00 pm. The objective of the workshop was to orient the F.Y.B.Sc students (Physics-Chemistry and Microbiology combination) to undertake short 6-week research projects which are interdisciplinary in nature under STAR-DBT scheme . Dr. Roshan D’Souza, Professor and Head, Department of Zoology, Sophia College, Mumbai, Dr. Jitendra Pendharkar, Assistant Professor in Physics, KJSSC and Dr. Lolly Jain, Associate Professor in Microbiology were the resource persons for the workshop. The workshop began with an Introductory talk by Dr. Roshan D’Souza. She explained the different types of research, difference between method and methodology, process flow that a researcher follows, essentials of a research report and summed it up by defining the criteria of good research. The students were also told to observe a dairy milk chocolate and share their findings. They were then grouped into 10 groups (5-6 students each). They were told to design their projects keeping in mind the time frame. The students represented their work in the form of problem statement, Methodology, resources required and subjects included in the project. The students were guided by all the three resource persons. They all came up with great and innovative ideas.
The projects designed are as follows:
Extraction of dyes from neem and beetroot and study of their antimicrobial property.
Get more with Milk! How nutritious is the Milk you are drinking?
Decomposition of Vegetable and fruit waste.
Kya apke Toothpaste mein Antimicrobial property hain?
Thugged by shampoos?
Battle of Disinfectants : FUN-TERIA…
Goodbye ACNE..
Plant Devils..
Fascinating Fungi..

The projects were suggested a few reforms. The students worked on these projects in the month of January and February 2019. The feedback of the students was taken and was quite encouraging. 46 participants attended the workshop. Certificates of participation were distributed to all the participants.

Workshop on Foldscope

The workshop on Foldscope was organized on 11th and 14th February 2019 . It was held in three batches:
Batch 1: 11th Feb 2019, 7.30 am to 8.45 am,
19 students attended with 2 faculty members(Dr. Lolly Jain and Ms. Varsha Pegwal).
Batch 2: 11th Feb 2019, 8.45 am to 10.00 am,
20 students attended with 2 faculty members. (Dr. Lolly Jain and Ms. Varsha Pegwal).
Batch 3: 14th Feb 2019, 7.30 am to 9.00 am,
24 students attended with 3 faculty members.(Dr. Lolly Jain, Mr. Shabib Khan and Ms. Varsha Pegwal).
The objective of the workshop was to orient the F.Y.B.Sc students (Physics-Chemistry and Microbiology combination) to understand and explore the use of easily available paper microscope invented by Mr. Manu Prakash Sharma for easy viewing of live samples.

Students were quite excited with the workshop and observed several samples in their live environment such as microbes in curds, microflora on spoiled fruits and vegetables, leaves, hair, onion cells & dissolution of soluble chemicals.
Dr. Anupma Harshal, Indo US Foldscope Grant Recipient,Phase I, was kind enough to share her expertise with the students, She explained the concept and need of foldscope. She also explained the students how to assemble the foldscope and helped them to focus the various samples brought by them.

The students were highly motivated and have expressed their desire to own a foldscope for themselves . Dr. Lolly Jain, organizer of the workshop has collectively placed the order for 40 foldscopes for the students. The students shared the photos and videos of specimens observed also on the foldscope community. Online feedback was taken.

18th State Level Microbio olympiad

The Department of Microbiology, K.J.Somaiya College of Science and Commerce organised the Preliminary test for the 18TH STATE LEVEL MICROBIOLOGICAL OLYMPIAD (Quiz Competition). Totally 71 Undergraduate students from the Department of Microbiology participated in the event. 14 F.Y.B.Sc, 28 S.Y.B.Sc and 24 T.Y.B.Sc students participated in the written preliminary Quiz competition (Total 66). Four T.Y.B.Sc students participated in the Microbioslate (Essay writing Competition). One T.Y.B.Sc student participated in the Microbiocanvas (Poster making competition) too.
The screening test was conducted on the 9th of January 2019 in the college. The test comprised of 50 objective type test questions. There was a different paper for different levels. Of all the participants only 4 S.Y.B.Sc students could not qualify. All the qualified participants were awarded a certificate of participation.
K.J.Somaiya college of Science and Commerce was at the 23rd position in the T.Y.B.Sc category with the total of the scores of the top 3 students being 168.00.The college ranked 13th in the S.Y.B.Sc category with the total of the scores of the top 3 students being 170.00. In the F.Y.B.Sc category the college stood 23rd with the total of the scores of the top 3 students being 192.00.
Ms. Divya Dinesh Singh Chauhan of F.Y.B.Sc (Microbiology) scored 68 % marks, Ms. Dimple Anand Gautam of S.Y.B.Sc (Microbiology) scored 62 % and Ms. Jewel Anil Monterio of T.Y.B.Sc (Microbiology) scored 58 % marks. All these 3 students stood first amongst the participants of the college.
This event was coordinated by Dr. Lolly Jain.

Intercollegiate Festival:

MICROSCOPE 2018: *Explore the world of mini wonders*

1st September, 2018, Vidyavihar, Mumbai: Department of Microbiology of K.J.Somaiya College of Science and Commerce organized State level Inter-Collegiate event MICROSCOPE-2018 sponsored by Hi-Media, T-Traxx, Express, Redbull, Vrushali's Astro Vastu consultancy, Khushal Security Services and Facilities, Bijy Tushar, FSI Diagnostic Centre, J.Parekh & Company, Microbiology-Alumni 2016-17 batch Arushi Pandya ,Vishal Shetty, Kashmira Sawant , Nidhi Goriwa and Varun Apte.
The event witnessed a huge number of 250 participants from Colleges within and outside Mumbai and for E-event 55 National and International participation was observed from Brazin,China,USA and Russia. Participants were from diverse fields ranging from

undergraduate and postgraduate levels having biological as well as non-biological backgrounds. Event began with the formal Inauguration session with dignitaries such as the Principal-Dr. Pradnya Prabhu, and Head of the Microbiology Department- Dr.Unnati Padalia on the dias. Inauguration Session was followed by the first Elimination round for Quizophilia event along with Presento event. Quizophilia had 96 participants divided into various teams. Presento event saw a large number of participants in which they delivered a Powerpoint presentation on latest topics from Life-Sciences.Judges for Presento (Post-Graduate section) Prof. Mrs. Shraddha Patel from Department of Microbiology, KBP College and Dr. Sneha Panvalkar G.N. Khalsa college.

This was followed by Bio-Humour event in which participants displayed their posters on various biological topics with humour incorporated in it and was judged by Ms. Shailaja Girishankar Ex-H.O.D. Microbiology K.J.S.Sc. and Dr. Kamalrookh Marolia Head, Department of Biotechnology, K.J.S.Sc.

After this was the Crime Scene Investigation event, which witnessed a total participation of 216 students in which they were given a case study along with some primary evidence and were asked to solve the mystery.

E event Unravel was introduced this year in which participation across the globe was observed and had sent solutions to the problems posted by Google form, the event was judged by Ms. Shailaja Girishankar Ex-H.O.D. Microbiology K.J.S.Sc.

Innovation factory was also a new addition this year were students were supposed to pen down their idea /design/model for the problems form the materials provided. Nishamol Kanat,Asst Prof. Chemistry,K.J.S.Sc. and , Dr Jayshree pawar,Asst. Prof Microbiology, Bandodkar College were the judges for the event.

This was followed by the final round of Quizophilia in which there were different competitive rounds with increasing difficulty level.

The last event was Biomimic- a skit based on a biological theme, where participants acted as living organisms, cells and presented interesting concepts and processes in life-sciences and was judged by Ms. Shailaja Girishankar Ex-H.O.D. Microbiology KJSSC and Dr.Lolly Jain Asst.Prof. from Department of Microbiology KJSSC. Finally the event culminated with the Valedictory and prize distribution ceremony where winners for different events were appreciated and awarded with trophies, certificates and exciting cash prizes.

Ms. Hemlatta Chakraborty and Dr. Rashmi Thakur worked as the Conveners for the event.

Demonstration of GLC and HPLC

Demonstration of GLC and HPLC was done on 30th March 2019 for S.Y.B.Sc students. 11 students attended the demonstration at Central Instrumentation Laboratory, K.J.Somaiya College of Science and Commerce.

Students were explained the working of instruments for GC and HPLC. This helped them to understand the principle based on which it functions. Futher, students got an exposure to the recent techniques. This created an interest among students and were motivated to work in such state of the art technology laboratories.

Physics

Sr.No.	Event	No.of Beneficiaries	From (Date) To (Date)	Venue
01	FIZIKA Department Fest	35 (outsiders)+ (127)(somaiya)	11th to 12th Jan 2019	K.J.Somaiya College, of Sc & Com, Mumbai
02	Hands on training	49 students + 10 faculty	7th Dec to 8th Dec 2018	K.J.Somaiya College, of Sc & Com, Mumbai
03	Workshop on maintenance of laboratory equipments in collaboration with Dept of chem and WRIC (Jointly organised by Chemistry and Physics Department)	49	13th to 16th Feb 2019	K.J.Somaiya College, of Sc & Com, Mumbai
04	Light Show	180 (School + college)	28th Feb 2019	K.J.Somaiya College, of Sc & Com, Mumbai

Zoology

Intercollegiate Festival: Zorilla

The department of zoology organises an Annual Intercollegiate fest - Zorilla , each year, with a nature friendly theme inorder to spread awareness among students about love for wildlife and sustainable development. This year the theme was "SYLVAN - back to roots".
Sylvan means 'of the forest' . The festival events were planned around this theme. The festival boasts an astounding 350 plus participants and is known for is carbon neutral practices such as

- use of recycled paper, old certificates, old brochures for its artwork
- only newspaper used for wrapping and other such.
- saplings given to all guests with 'adopt me' tags
- no printing of pamplets and brochures
- videos and images were used for canvassing
- e- certificates given to all participants.

The prime attraction is the Fauna race which is a race to identify maximum species on campus, so participants learn to identify birds insects reptiles etc... The Rock-a - doodle was a new event with students showing Marine based Art on Rocks!!. SHUTTERBUG - thr photography exhibit was also based on widlife photography based on Wildlife in Action & Insecta.

The two invited speakers were Renowned wildlifers like the Elephant Whisperer Mr Anand Shinde and Marine Expert Mr.Pradip Patade.
The volunteers were taken for a Marine Walk at Haji Ali by our sponsors Marine Life of Mumbai , to understand and appreciate the marine biodiversity of mumbai.

The entire fest was covered by Maharashtra Times as our Media Partner.

8. Name, Designation, Host institute of invited faculty
Biochemistry :

Sr. No	Name of Resource person	Designation	Host Institute	Duration	Programme and its date	No. of student Beneficiaries
1	Ms. Himani Chowhan	Senior Research Associate,	Learning mate Pvt Ltd	1 day	Seminaron "Career options in Management" on 30th June 2018	32
2.	Mr. Satish Kumar Gupta	Chief Assessor/ Food Scheme Manager,	Indian Register Quality Systems (IROS), Mumbai	1 day	Seminar on "Career options in Food Auditing" on 13th August 2018	35
3.	Dr.Chetan Vedpathak Dr.Sonali Lohar Ms. Shraddha Gandhi	Ayurvedic Consultant Audiologist and Speech therapist Aura reader, Mystologist		1 day	Swasthya Mahotsav 2019 a lecture series by eminent health professionals conducted on 22nd January 2019	61
4	Chef Sonali Thakur	Pastry chef,	Hyatt Regency , Mumbai	1 day	Workshop by on healthy cooking on 22nd January 2019	70
5	Mrs. Yogita Narvekar	Technical expert and proprietor		1 day	A workshop on electrophoresis 10th December, 2018	45

Botany

Name	Designation	Host institute	Duration of visit	Topic of discussion	No.of beneficiaries
Mr.Deepak Badhe.	Research scientist	Marico Ltd	02 hrs	Scope of Botany in cosmetic Industry	S.Y.B.Sc -71 T.Y.B.Sc -37 M.Sc -04
Mr.Parth Bapat	Director & Learning Catalyst	Somaiya Center for Experiential Learning	02 hrs	EIA	S.Y.B.Sc -65 T.Y.B.Sc -40
Ms.Shatabdi Sawant	Lecturer	I Y College of Arts, Science & Commerce, Jogeshwari.	02 hrs	Landscape designing	S.Y.B.Sc -02 T.Y.B.Sc -32
Dr.Harish Shetty	Psychiatrist	Private Practitioner	03 hrs	Comprehensive stress management socio - academic interphase	Undergraduates of all disciplines: 135

Chemistry

Name	Designation	Host institute	Duration of visit	Topic of discussion	No. of Beneficiaries
Dr. Ganesh Naik	Professor	College of Saint Mary, Omaha, Nebraska, USA	27th June 2018	Chemistry and Society	70
Dr. A. K. Tyagi	Scientific officer H^{+}	Bhabha Atomic Research Centre	8th December 2018	Chemistry for better future	26 faculty 120 Students

Dr. Mayur Desai	Assistant Professor	Gogate college of Arts, Science and Commerce, Ratnagiri	23rd Feb 2019	Stereochemistry	03 faculty 100 Students
Dr. Ashok Borade	Associate Professor	H P T and R Y K College, Nashik	23rd Feb 2019	Molecular Spectroscopy	05 faculty 118 Students

Microbiology

Name	Designation	Host institute	Duration of visit	No.of beneficiaries	Topic of discussion
Dr. Vikrant Bhor	Scientist G	National Institute for Research in Reproductive Health (NIRRH)	2 Hours (11th Aug. 2018)	41 (S.Y.B.Sc, T.Y.B.Sc and M.Sc students)	Understanding host- pathogen interaction using proteomics
Mr. Ramchandra Amnekar	Alumnus enrolled for Ph.D on epigenetics and chromatin in biology	Tata memorial center's-Advanced center for treatment and research and education in cancer	2 hours (30th Aug. 2018)	139 (F.Y.B.Sc, S.Y.B.Sc, T.Y.B.Sc and M.Sc students)	Epigenetics: its role in physiology and disease
Ms. Mita Sheikh	Principal Associate, Registered Patent agent	IIPRD, Khurana and Khurana	1 hour (27th August, 2018)	30 (S.Y.B.Sc, T.Y.B.Sc and M.Sc students)	Patents, Patent procedures and Career opportunities in patents
Dr. Sangeeta Joshi	Senior manager of quality assurance at the Board of Radiation and Isotope Technology	BARC, Vashi	1 hour (4th February, 2019)	50(S.Y.B.Sc, T.Y.B.Sc and M.Sc students)	"Radiopharmaceuticals and their applications"

Physics

Name	Designation	Host institute	Duration of visit	No.of beneficiaries	Topic of discussion
Dr. D J Biswas	Former Senior scientist	BARC	6th Sept 2018	Students: 85 Faculty: 13	"Secure Optical Communication with Lasers and the effect of Butterfly Effect
Mr. Saumya Mishra	Vice President	Reliance-Jio	11th Jan 2019	Students: 120 Faculty: 15	4G technology
Prof. Sudhakar Agarkar	Former. Senior scientist	HBCSE	18th February 2019	Students: 60 Faculty: 15	Development and significance of periodic table

Zoology

Name	Designation	Host institute	Duration of visit	Topic of discussion	No.of Beneficiaries
Dr. Lalit Sharma	Veterinary Consultant	Freelancer	06th July, 2018	World Zoonosis Day	SYBSc & TYBSc- 60
Ms. Kiran Deshpande	Dietician	Apollo Hospital	21st July 2018	Career after Zoology - dietetics	SYBSc & TYBSc- 51
Ms. Harshini Kanekar	First women fire Engineer in Asia	ONGC	17th July 2018	Motivational lecture for students	SYBSc & TYBSc- 35
Mr. Nikit Surve	Research Associate, Wildlife Conservation Society - India	Wildlife Conservation Society - India	21st August 2018	Careers after Zoology - Research in Wildlife	FYBSc, SYBSc & TYBSc- 72
Mr. Anand Shinde	Founder	Truncall Foundation	30th Nov 2018	Elephant Communication	FYBSc, SYBSc & TYBSc- 80
Mr. Pradeep Patade	Founder	Marine life of Mumbai	1st Dec 2018	Marine Biodiversity along Mumbai Sea shore	FYBSc, SYBSc & TYBSc- 80

10. Date of Advisory Committee Meeting: July 05th, 2018

11. List of New Practical/Demonstrations introduced

Biochemistry :

- Hematological Experiments:-
- Blood group Analysis
- Hb Estimation (Sahli's / Drabkins method)
- RBC & WBC count
- Biochemical & Microbiological analysis of food
- Colorimetric experiments using Micropipette

Botany : (Please refer Annexure I for Protocol)

- Isolation Of Rhizobium from Root nodules of Leguminous Plants.
- Study of UV induced mutagenesis in bacteria**.**

Chemistry

- Two burette Method
- Microscale Technique
- Use of Pipetters
- Gas absorbing Tubes
- Stalagnometer and Viscometer
- Safety glasses and Gloves
- Crystallography models for Solid state chemistry.
- Ball and stick model for stereochemistry.
- Atomic orbital models for hybridization concept.
- Determination of percentage composition of the given mixture of two liquids by surface tension measurements.
- Study of variation of surface tension of organic solution with concentration and determination of limiting cross section area of organic molecules.
- Separation of food colors using TLC.
- Determination of amount of calcium present in tooth paste.

Microbiology : (Please refer Annexure I for Protocol)

1. Estimation of Cholesterol for S.Y.B.Sc and T.Y.B.Sc students.
2. Detection of enzyme activity: Casease, Diastase, Catalase and Dehydrogenase for F.Y.B.Sc students.
3. Use of Motility agar for demonstrating motility of bacteria for F.Y.B.Sc students.
4. Preservation by Glycerol Stock method for F.Y.B.Sc students.
5. Column Chromatography for S.Y.B.Sc students.* Protocol Developed and attached alongwith as ANNEXURE -I.

Physics : Laser divergence at F.Y.B.Sc.

Zoology : (Please refer Annexure I for Protocol)

1. Detection of gut enzymes in Cockroach
2. Detection of gut enzymes of vertebrate
3. Blood group testing by kit method

12. Details of Equipment purchased in each Department from DBT Grant (item no., cost, date of order placed, purchase/installation)

The grant is only for recurring expenses

13. Details of books and Journals subscribed / purchased from DBT Grant.

Botany

Sr.No	Title of the book	Author
1.	Bionanotechnology	Madhuri Sharon
2.	Biostatistics	Veerbala Rastogi
3.	Pharmacognosy	Kokate
4.	PharmacognosyVol (I)	Rangari
5.	Pharmacognosy Vol (II)	Rangari
6.	Plant Systematics	Guru Charan Singh
7.	Introduction to Plant Biotechnology	Chawla
8.	Plant Tissue Culture	Razdan
9.	Biotechnology	S.S.Purohit
10.	Principles of Microbiology	Sumbali
11.	Research Methodology	Kothari
12.	Biotechnology	Crueger
13.	Applications and Research in Biotechnology	Pandan
14.	Nanotechnology	Sulbha kulkarni
15.	Microbiology	Pelczar
16.	Nanomaterials	Vishwanathan
17.	Algae	Vashishta
18.	Plant Biotechnology	Slater
19.	Fungi	Vashishta
20.	Plant Taxonomy	O P Sharma
21.	Horticulture: Principle and Practices	George and Acquah
22.	Plant Anatomy	B P Pandey
23.	Ethnobotany	Amritpal Singh Saroya
24.	Horticulture	B Kumarsen
25.	Biofertilizer: Production manual	Dushyant Dehlo

Zoology

Sr.No.	Title of the book
1	Biochemistry by Satyanarayana
2	Human Histology by Inderbir Singh
3	Biotechnology by Satyanarayana
4	Fundamentals of Ecology by Odum
5	Textbook of Practical physiology by Inderbir Singh
6	Textbook of microbiology by Anantnarayan and Panikar
7	Human Embryology by Inderbir Singh
8	Genetics by Strickburger

14. Qualitative improvements due to DBT support

Please highlight (5 salient lines)

- Several faculty were already trained in flipped class pedagogy and they were implementing it in the classroom sessions too. However due to STAR-DBT grant we could enhance the implementation of this effective pedagogy due to purchase of CYBERNETIX boards which allows for more active involvement between the faculty and the students.
- The STAR-DBT grant allowed us to expose the students to the wonderland of microscopic live samples through the use of FOLDSCOPE. As a continuation of this activity we plan to initiate a facebook Somaiya foldscope community wherein the students will upload the videos, photographs of their foldscope venture as and when they explore and share with everybody.
- The STAR-DBT grant allowed us to envisage new experiments in several subjects such as Zoology, Botany, Microbiology, Biotechnology at different levels and it allowed us enrichment of our curriculum and added value to our autonomous status. Duplication of routine experiments has brought about robustness in the departmental experimental planning.
- Research based Pedagogy tools, Project based learning and Problem based learning could be initiated at all levels (F.Y.B.Sc, S.Y.B.Sc and T.Y.B.Sc) due to the availability of STAR-DBT grant. It honed the research aptitude of the undergraduate students. Student numbers opting for projects has increased and the time they spend in the department after class has given them a great sense of happiness and power to discuss and analyses. To highlight, the chemistry students have designed and manufactured a Food adulteration detection kit, which was demonstrated and distributed to several schools in the local neighbourhood. It has enabled the department to execute projects with perceivable results for the students.
- The STAR-DBT grant allowed us to encourage and motivate undergraduate students to attend and present their projects in the form of posters and oral presentations in several Local, State, National and International conferences and Research conventions. To highlight, our S.Y.B.Sc (Chemistry-Zoology and Chemistry-

Microbiology) students represented their work at Avishkar, a state-level Research Convention.

15. Problems faced, if any, in implementation of the programme and utilization of DBT grant (in two-three lines)

- Timely Release of funds
- Difficulties in Entries in PFMS portal
- Inclusion of Laptops, Printers, LCD Projector as teaching aids and Small equipments under Recurring grants

****

ANNEXURE –I: New Protocols Designed under STAR DBT

Botany

Effect of UV Radiation on Survival of E coli strain and study of SOS Repair.

Direct-Plate Irradiation Method

1. For the series of direct-plate kill experiments, sub-cultures were grown by inoculating (1:50 dilution) LB broth (20ml final volume) with the overnights and grown to about 1 x 10^8 cells per ml, approximately 0.7 to 0.8 OD660nm.
2. These sub-cultures were grown in flasks placed in a 37°C orbit-shaker.
3. When the sub-culture reached the desired optical density, a series of dilutions of the sub-culture was prepared; these dilutions are 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, and 10^{-5}.
4. These dilutions were then used to make final plates for the ultraviolet irradiation by spread-plating 0.1 ml of the diluted sub-cultures onto various nutrient plates.
5. The final plated dilutions are $10^{-2,}$ 10^{-3}, 10^{-4}, 10^{-5}, and 10^{-6}.
6. For most experiments, the dilutions of 10^{-2}, 10^{-3}, and 10^{-4} were used for the treatment set while 10^{-5} and 10^{-6} dilutions were the control.
7. After plating, the plates were kept in a black box (plastic cooler box) before and after irradiation unless otherwise noted.
8. All UV irradiations were done in a custom-built UV chamber with a glass front. The UV lamp could be adjusted vertically to a desired height of up to 1.2 metres.
9. The majority of the experiments were done in the dark to avoid photoreactivation.
10. The only time a light source was present was during the transfer of the plates into the UV chamber.
11. Before each irradiation, the UV lamp was warmed up for at least 30 minutes. For each UV exposure time point one plate from each treatment set (10^{-2}, 10^{-3}, and 10^{-4} dilutions) were randomly placed in the centre of the chamber and irradiated for the set time; this was done by using a digital timer and by manually adjusting the power switch of the UV lamp.
12. The lids of the treatment plates were removed before placing the plates into the chamber to avoid shielding by the lids.
13. After irradiation, the lids were replaced and the plates were immediately placed into the black box. All the plates were grown in the 37°C incubator for 24 to 36 hours before scoring the number of colonies

Microbiology

Column Chromatography for separation of Dyes (Protocol Developed by Mr. Shabib Khan, Department of Microbiology)

Earlier in S.Y.B.Sc., Microbiology; Column Chromatography was conducted as a demonstration Practical in Semester IV, but with the impact of DBT-STAR Scheme this year

all the students could set up a mini column using glass dropper tubes and could chromatographically separate the mixture of dyes which was given to them. This practical created a significant impact on the understanding level of the students where each student could use Column grade Silica and set up the Column, load the mobile phase and sample and observe the process. There was an enhancement in the understanding level of the students.

Introduction to Chromatography: The term Chromatography means writing in colour (in Greek Khromas- colour and graphos-written). It was discovered by Mikhail Tswett in 1906. Chromatography has been researched upon and eventually developed into a new method of separation of mixture of substances, mainly when they are available in small amounts. Chromatography method is very significant when the components of a mixture have almost the same physical and chemical properties and hence cannot be separated by other unusual methods of separations.

Basically the methods of separation in chromatography are based on the distribution of the components in a mixture between a fixed (stationary) and a moving (mobile) phase. The stationary phase may be a column of adsorbent, a paper, a thin layer of adsorbent on a glass slide etc. through which the mobile phase moves on. The mobile phase may be a liquid or a gas. When a solid stationary phase is taken as a column it is known as Column chromatography.

Column chromatography is one of the most useful methods for the separation and purification of both solids and liquids. This is a solid-liquid technique in which the stationary phase is a solid and mobile phase is a liquid. The basic principle is based on differential adsorption of substance by the adsorbent.

Many adsorbents are available for use in column chromatography, such as silica, alumina, calcium carbonate, calcium propionate, magnesia, starch etc. selection of solvent is based on the nature of both the solvent and the adsorbent. The rate of separation of components depends on the activity of the adsorbent and polarity of the solvent. If the activity of the adsorbent is very high and the polarity of the solvent is very low, then the separation is very slow but gives a good separation. On the other hand, if the activity of the adsorbent is low and the polarity of the solvent is high, the separation is rapid but gives only a poor separation, that is the components separated are not 100% pure.

Adsorbent is made into a slurry with a suitable liquid and placed in a cylindrical tube that is plugged at the bottom by a piece of glass wool or a porous disc. The mixture to be separated is dissolved in a suitable solvent and introduced at the top of the column and is allowed to pass through the column. As the mixture moves down through the column, the components are adsorbed at different regions depending on their ability for adsorption. The component with greater adsorption power will be adsorbed at the top and the other will be adsorbed at the bottom. The different components can be desorbed and collected separately by adding more solvent at the top and this process is known as elution. The process of dissolving out of the components from the adsorbent is called elution and the solvent is called eluent. The weakly adsorbed component will be eluted more rapidly from the other. The different fractions are collected separately. Distillation or evaporation of the solvent from the different fractions gives the pure components.

Principle: Different compounds in a mixture separate due to the difference in their affinities towards the stationary and the mobile phases.

In most column chromatography, the stationary phase has relatively high polarity and the mobile phase has low polarity. Compounds will show differential adsorption based on their relative affinity to the mobile phase and the stationary phase. The differential adsorption of compounds is a characteristic of the polarity of compounds relative to the two phases. Thus compounds have a high polarity for solvents with a similar polarity to themselves. Polar compounds easily dissolve in polar solvents and have a low affinity to non-polar solvents and hence will move with the mobile phase. If a compound has a high affinity to the stationary phase it will come out slower than a compound which has a lower affinity to the stationary phase.

Applications: The applications are wide reaching and span over many disciplines including Microbiology, Biotechnology, Botany, Biochemistry, Zoology, Medicine, Chemistry and allied sciences

Requirements:

Apparatus: Clean and dry Glass columns, petri dishes, beakers, capillary tubes, dilution test tubes.

Chemicals: Silica gel 60-120 mesh, Methanol, mixture of dyes, distilled water.

Miscellaneous: Clean and dry Micro tubes, cotton, test tube stand, bottom sticks, rubber bulb.

Procedure:

1) The glass tube of the dropper is used as a column. Plug the tapering end of the column with cotton.
2) Use a long glass rod or broom stick to place the cotton at the tapering end of the column. (The cotton should be compressed enough to support the column packing yet loose enough that the solvent flow will not be hindered).
3) Place the column in a beaker which can also be the fraction collector.
4) Prepare the silica gel column by dry pack method. Other method is wet pack method where a slurry of silica in an appropriate solvent can be made and used for column packing.

Dry pack method:

a) The stationary phase i.e silica gel 60-120 mesh is activated by keeping in an oven at 110^0C for 30 minutes.
b) The activated silica gel 60-120 mesh is then deposited in the column, fill the column to the intended height with the stationary phase.
c) Then slowly add the solvent A (methanol) till the silica saturates. [The solvent should be added slowly as to avoid uneven channelling.]
d) The column is now ready for use. [Try to pack the column as evenly as possible: cracks, air bubbles and channels will lead to a poor separation.]

5) When the solvent A reaches the silica gel surface, slowly add the mixture solution, (different combinations of mixture of dyes can be used, each mixture having two dyes, such as-Safranin and Malachite Green, Basic Fuchsin and Malachite Green,

Methylene Blue and Basic Fuchsin etc.) into the column using a capillary tube. The flat surface of silica gel should be minimally disturbed.

6) Allow the sample to adsorb on to the silica gel, and gently rinse the inner wall of the column with solvent.
7) When the solvent reaches the top of the column again, carefully add more solvent to the column. Do not let the column dry out during the elution process.
8) After elution of one of the components, add solvent B (50% methanol + 50 % distilled water) to the column.

Observation: (will be reported by student)

Result and Conclusion: (will be reported by student)

Suggested Reference for further reading:

Principles and Techniques of Biochemistry and Molecular Biology- Keith Wilson and John Walker 7th edition, Cambridge University Press.

Zoology

Detection of Gut enzymes in cockroach

Cockroach is starved for 24 h before dissection to standardize them and to allow the accumulation of digestive enzymes. The insects are placed at -20 °C for 4 min and then dissected in ice-cold 0.9% NaCl solution under a dissecting microscope. The alimentary tract is removed by placing the scissors points between the junction of the third and second to the last tergites. Two incisions are made along each laterally arranged spiracle, continuing through to the thorax. Once the tergites are freed from the underlying connective tissue they can be removed in one piece. By grabbing the head with a forceps and cutting the surrounding neck chitin, the entire digestive tract is removed by gently lifting the head and freeing the attached tract moving caudally toward the anus. The extracted digestive tubes are separated into the foregut, midgut and hindgut, and each gut region is kept in 1 ml ice-cold sodium phosphate buffer (pH 7.1). The tissues are homogenized and ultra-centrifuged at 16,000 rpm for 10 min at 4 °C. The supernatant is placed in a centrifuge tube and kept at 4°C.

I Proteinase assay

Aim: To detect gut enzymes in cockroach

Requirement: Protein like 1% Casein, Crude enzyme extract, ice cold 10% TCA (Trichrolo Acetic acid, alkaline Copper sulphate, 2:1 Folin Ciocalteau reagent, water bath, pipettes, test tubes, beakers etc.

Principle: The copper ions acts on peptide bonds under alkaline condition and oxidizes amino acids like tyrosine and tryptophan which when treated with phosphomolybdic and phosphor tungstic acid forms a blue coloured complex heteropolymolybdenum.

Procedure: Follow the steps according to the table below-

Sr. No	Test tube	1% Casein	Crude Enzyme Extract	Distilled water	10% TCA(ice cold)	Centrifuge at 2500 rpm for 10 minutes. Discard the precipitate. Take 1ml of the supernatant in another test tube	Alkaline copper sulphate	2:1Folin's Reagent	Shake the mixture well and incubate at room temperature for 30 minutes.
1)	Test	1 ml	0.5 ml	-------	3 ml		5 ml	0.5 ml	
2)	Control	1ml	---------	0.5 ml	3 ml		5ml	0.5 ml	

Observation: blue coloured complex complex develops in the tube containing enzyme extract.

Result: Enzyme Proteinase was present in the crude gut extract of the cockroach

II α-Amylase assay

Aim: To detect the presence of enzyme α-Amylase assay in the gut extract of Cockroach.

.Requirements: 1% starch, crude enzyme extract, DNSA reagent, lugol's iodine solution

Principle: Iodine forms a blue coloured complex with starch. α-Amylase digests starch so available quantity of starch to form complex with iodine is reduced hence intensity of blue colour also reduces.

Procedure: follow the steps mentioned in the table-

Sr.No	Test tube	1% starch	Crude enzyme extract	Distilled water	Mix well and incubate at room temperature for 30 minutes	DNSA reagent	Lugol's iodine
1)	Test	0.2 ml	1ml	0.7 ml		1 ml	1 ml
2)	Control	0.2 ml	-----	0.8 ml		1ml	1 ml

The colour development in the two tubes was observed.

Observation : The tube containing enzyme extract showed lesser intensity of blue coloue as compared to the tube not containing it.

Result: the gut extract of cockroach contains enzyme α-Amylase.

III Specific activities of lipases

Requirement: Crude enzyme extract, 25% triglyceride (dalda or any Oil), Chloroform, 0.05 M NaOH, Phenolphthalein indicator.

Principle: The enzyme Lipase catalyzes the hydrolysis of triglycerides to fatty acid and glycerol. The extracted fatty acid from alcohol when titrated with NaOH gives an end point from colour less to pink.

Procedure:

1) Take two conical flask. Label one flask as control and the other as test.

2) In the flask labeled test take 10 ml of 25% triglyceride and 2 ml of crude enzyme extract.

3) In the flask labelled control take 10ml of 25% triglyceride and 2ml chloroform.

4) Incubate both the flasks for 1 hr at 37º C.

5) Add 10 ml 0f 95% ethanol to both the flask and few drops of Phenolphthalein indicator

6) Titrate both the flask against 0.05 M NaOH in the burette until end point changes from colourless to pink.

Observation:

The flask containing enzyme extract turns pink faster indicated that the triglyceride is hydrolyzed to fatty acid by the enzyme lipase.

Result: Enzyme lipase is present in the crude enzyme extract.

Blood Group testing by kit method

1. Take a clean glass slide with three cavities or circles marked on it.
2. Mark them as anti A, anti B and anti D respectively
3. Swab the tip of ring finger with spirit and gently puncture with a sterile needle or Lancet.
4. Take one drop of blood in each of the marked circles
5. Add 1 drop of reagent A , B and D to the respective circles.
6. Mix the content of each circle with a sterile applicator stick and look for clumping within 30 seconds
7. Dispose all needles, cotton safely
8. If clumping observed in circle marked as anti A then blood group is A. If clumping observed in circle marked as anti B then blood group is B. If clumping observed in circle marked as anti A and B both then blood group is AB. If clumping is observed in neither A and B then blood group is O.
9. If clumping is observed in circle marked as anti D then blood is Rh positive otherwise blood is Rh negative.