



JAMAL MOHAMED COLLEGE (Autonomous)

COLLEGE WITH POTENTIAL FOR EXCELLENCE
Accredited (3rd Cycle) with 'A' Grade by NAAC
DBT Star College Scheme & DST - FIST Funded
(Affiliated to Bharathidasan University)

**No.7, RACE COURSE ROAD, KHAJANAGAR, TIRUCHIRAPPALLI - 620020.
TAMILNADU, INDIA.**

Website : www.jmc.edu

Email : principaljmc@ymail.com / princi@jmc.edu

13.09.2022

To

Dr. Arindam Bhattacharya,
Scientist 'F',
R & D Infrastructure division,
Department of Science & Technology,
Technology Bhawan, New Mehrauli Road,
New Delhi – 110 016.

Sir,

Sub: Submission of Annual progress report for the period from 1st April 2021–31st March 2022 - Reg

Ref: DST-FIST Project No. SR/FST/College-2018-315 (c) dated: 22/07/2019.

I am pleased to submit the Progress report of DST-FIST project funded by Department of Science and Technology for the period 1st April 2021 – 31st March 2022. We sincerely acknowledge the DST for the consistent financial and moral support rendered throughout the project period. Due to pandemic, the purchase and installation of instrument was delayed. Here with we have enclosed the following documents for your kind perusal and necessary action.

1. Progress report for the period from 1st April 2021 to 31st March 2022.
2. Audited Utilization certificate & Statement of expenditure for the period 1st April 2021 to 31st March 2022.
3. Receipt of interest earned (Rs. 74,248/- Rupees Seventy Four Thousand and Two Hundred Forty Eight) has been submitted to NTR portal (Bharatkosh gov.in)

We eagerly look forward to your support in all our future endeavors.

Thank you very much

Yours faithfully,

13/9/22
PRINCIPAL
PRINCIPAL
JAMAL MOHAMED COLLEGE
(AUTONOMOUS)
TIRUCHIRAPPALLI-620 020.

Copy to

1. Dr. Shubham Goel, Scientist-B, R & D Infrastructure division, DST, New Delhi
2. Dr. R. Jahir Hussain, Coordinator, DST-FIST Project of Jamal Mohamed College, Tiruchirappalli – 620 020.
3. Dr. A. Shajahan, Dean of Research, Jamal Mohamed College, Tiruchirappalli – 620 020.
4. College Office.



FIST PROGRAM (Level-0) PROGRESS REPORT (2021 - 2022)

(Participating Departments - Botany, Chemistry, Computer Science, Mathematics, Physics & Zoology)

**2021
-
2022**

PROJECT No.SR/FST/College-2018-315 (c)
dated 22nd July 2019

Submitted to



Department of
Science & Technology,
Govt. of India.

***Department of Science & Technology
Technology Bhawan, New Mehrauli Road
New Delhi – 110 016***

Submitted by



***Jamal Mohamed College(Autonomous)
7, Race Course Road
Khaja Nagar, Tiruchirappalli – 620020
Tamil Nadu***

**DST – Fund for Improvement in S & T Infrastructure
(FIST Level-0)**

	CONTENT	Page No
<u>Part – A</u>		1 - 3
	Brief outline of the College	1
	Teaching and Research activities	1
	Facilities created	2
<u>Part - B</u>	Pro-forma for Report for utilization of FIST support	4 - 20
Annexure 1	Details of Books Purchased	21 - 26
Annexure 2	Research Publications	27 - 36
<u>Part - C</u>	Audited Documents and Receipts	37 - 40
Enclosure 1	Statement of Expenditure (for the Period from 1st April 2021 to 31st March 2022)	37
Enclosure 2	Utilization Certificate (for the Period from 1st April 2021 to 31st March 2022)	39
Enclosure 3	Receipt of interest earned submitted to NTR portal (Bharatkosh gov.in)	40

PART – A

Jamal Mohamed College (Autonomous) Tiruchirappalli – 620020

(Project No: SR/FST/College-2018-315 (c) dated 22nd July 2019)

Brief Outline of the College:

Jamal Mohamed College as a religious minority institution founded in 1951, with the primary objective of providing higher education to the downtrodden and socially backward section of the society. In 1972, the college was recognized by UGC New Delhi, for the purposes of Grants under section 2(F) and 12(B) of the University Grants Commission Act 1956. In 1977, on the recommendation of the University of Madras, the UGC recognized the college as one of the ten "Lead colleges" in the university area.

The college able to scale greater heights and rise to the present status with 23 UG and 21 PG courses. The college has strength of around 12000 students. There are 145 Government Aided teaching faculty and 357 staff members are working under the self-finance stream.

Teaching and Research Activities:

Teaching:

We have an effective ERP system with which we have been conducting all the regular UG and PG classes. Many faculty development programs, webinars, training programs and workshops have been organized by the departments for the benefit of the teachers and students. All our faculty members have attended faculty development programs, orientation / refresher programs, webinars and workshops for the enrichment of their knowledge and enhancement of their teaching skills. Most of the faculty members are using the ICT facilities and smart classrooms available in their departments, for effective teaching. The feedback on Teaching-Learning-Evaluation and on Campus Environment are also obtained online from all the students.

Research:

As research leads to the enrichment of the teachers' knowledge and understanding, the college management encourages the faculty members to carry out original research by providing cash incentives for the publication of research articles in the peer reviewed reputed journals approved by the UGC and for the publication of books with ISBN. A cash incentive of Rs. 1000/- is given for each publication in Web-of Science/Scopus indexed journals and Rs. 500/- for the publications in other UGC CARE List journals. An incentive of Rs. 2000/- is given for publication of a book and Rs. 10000/- for patent. Monetary incentives are also given

to the research guides for the guidance and supervision of M.Phil. and Ph.D. scholars pursuing both full-time and part-time research work.

The college publishes an Interdisciplinary referred journal entitled ‘Jamal Academic Research Journal (JARJ)’ and a Peer reviewed science journal entitled ‘Journal of Advanced Applied Scientific Research (JAASR)’ to promote research publications among the students and faculty members.

The faculty members are also encouraged to carry out socially relevant research projects, the college management provides a seed money of Rs. 10,000 to Rs.50,000 for each such project.

Faculty members are encouraged to submit research project proposals to various funding agencies such as DST, DBT, UGC, etc. and necessary infrastructure facilities are provided by the college authorities for all the sanctioned projects.

Facilities Created:

DST-FIST funded Common Instrumentation lab has been installed with the name of JAMAL INSTRUMENTATION CENTRE (JAMIC). Four major instruments, FT-IR Spectrometer, BINARY HPLC, FT RAMAN spectrometer and Atomic Absorption Spectrometer, facilities are made available for the usage to Faculty, Research Scholars and Students of Jamal Mohamed College and other neighboring institutes.

Jamal Instrumentation Centre (JAMIC)



Funding:

With a view to utilizing the DST-FIST Funds granted judiciously, a Common Instrumentation Centre was established in the campus. Networking Facilities, E-learning Class Room and equipments like FT-IR Spectrometer, BINARY HPLC, FT RAMAN spectrometer and Atomic Absorption Spectrometer were purchased, installed and maintained in the common Instrumentation Centre. Besides, books and reference materials were also purchased under the grant received.

It is pertinent to point out that in addition to the DST-FIST fund of Rs. 1,05,75,000/, the college Management has borne an additional expenditure of Rs. 10,96,840.86 for this purchase of instrument mentioned above.

<p style="text-align: center;">Contact Address:</p> <p style="text-align: center;">Dr. R. JAHIR HUSSAIN, Head / Coordinator</p>	<p style="text-align: center;">Mobile No: +91-9443836946</p>
<p>Jamal Mohamed College (Autonomous) No.7, Race Course Road, Khaja Nagar, Tiruchirappalli – 620 020, Tamil Nadu.</p>	<p style="text-align: center;">Email ID: hssn_jhr@yahoo.com / rj@jmc.edu</p>

PART – B

Pro-forma for Report for utilization of FIST support

1. Name of College:

Jamal Mohamed College(Autonomous) Tiruchirappalli – 620020

2. Address for communication:

Dr. S. Ismail Mohideen, Principal

Jamal Mohamed College (Autonomous) Tiruchirappalli – 620 020 0431

Phone: 0431-2331135, 2331235 (Mobile: +91-9894113582) 0431–2331035, 2331435

Email ID: principaljmc@ymail.com Website: www.jmc.edu

3. Date and Ref. No. of DST Sanction letter:

SR/FST/College-2018-315 (c) dated 22nd July 2019

4. Details of the Grants:

Amount Sanctioned with Date: Rs.110.0 lakh (Rupees One crore and Ten lakh only) on 22nd July, 2019.

Ist Year Amount Received with Date: Rs. 60.5 lakh (Rupees Sixty Lakh and Fifty Thousand only) on 31st July,2019.

IInd Year Amount Received with Date: Rs. 45.25 lakh (Rupees Forty-Five Lakh and Twenty-Five Thousand only) on 19thJuly2021 & 23rd July,2021.

Budget Heads	Amount Sanctioned (Rs in Lakhs)						Amount received (Rs in Lakhs)	
	I year	II year	III year	IV year	V year	Total	I year (Amount received on 31.07.2019)	II year (Amount Received 19.07.2021 & 23.07.2021)
a. Equipment	60.0	32.0	-	-	-	92.0	60.0	32.0
b. Infrastructure (Books & Renovation of labs)	0.50 (B)	0.50(B) +5.0 (E learning class room)	0.50 (B)	0.75 (B)	0.75 (B)	3.0+5.0	0.50 (B)	5.50
c. Networking	-	7.0	-	-	-	7.0	-	7.0
d. Maintenance	-	0.75	0.75	0.75	0.75	3.0	-	0.75
e. Total	60.5	45.25	1.25	1.50	1.50	110.0	60.5	45.25

5. Equipment Installed:

Total cost of the Equipment is Rs. 1,02,96,704.94 (Rupees One Crore Two Lakhs and Ninety Six Thousand Seven Hundred Four and Ninety Four Paise only). DST has released Rs. 92 Lakhs (Rupees Ninety Two Lakhs only) for procuring the Equipment and the excess amount of Rs. 10, 96,704.94 (Rupees Ten Lakhs Ninety-six Thousand seven hundred four and ninety four paise only) has been contributed by the Management of Jamal Mohamed College, Tiruchirappalli.

Details of the expenditure for equipment

S. No.	Name of the Instrument	Date of Order	Date of Delivery	Date of Installation	Cost in INR
1.	MUTIRAM-Bruker of FT RAMAN spectrometer model MULTIRAM.	29/11/2019	18/02/2020	24/11/2020	70, 96,646.86
2	FT-IR Spectrometer (Model ALPHA II, Bruker-Germany)				
3	BINARY HPLC	18.12.2022	26.04.2022	11.05.2022	19,92,838.00
4	Atomic Absorption Spectrometer Model: ICE FIOS 1	18.12.2022	05.05.2022	11.05.2022	12, 07,220.08
Total					1,02,96,704.94

a. FT RAMAN SPECTROMETER ENTIRE UNIT



b. FTIR SPECTROMETER ENTIRE UNIT



c. BINARY HPLC ENTIRE UNIT



d. ATOMIC ABSORPTION SPECTROMETER



6. Details of Infrastructure developed:

Total cost for E-learning class room and books purchased (**Annexure – I**) under the head of Infrastructure is Rs. 5,86,317 (Rupees Five Lakhs and Eighty Six Thousand Three Hundred and seventeen only). The balance amount of Rs.13,683 (Rupees Thirteen Thousand six hundred and Eighty Three only) is adjusted with Networking.

a) E - Learning class room

S. No	Computer Accessories	Number of Items	Amount (In Rs.)
01	Epson EB-148FI Laser Ultra Short Throw	1	4,86,050
02	Accessories for Projector	3	
03	Ahuja Audio System	8	
04	Lenovo AIO Desktop System A-340-241WL FOE800SSIN	2	

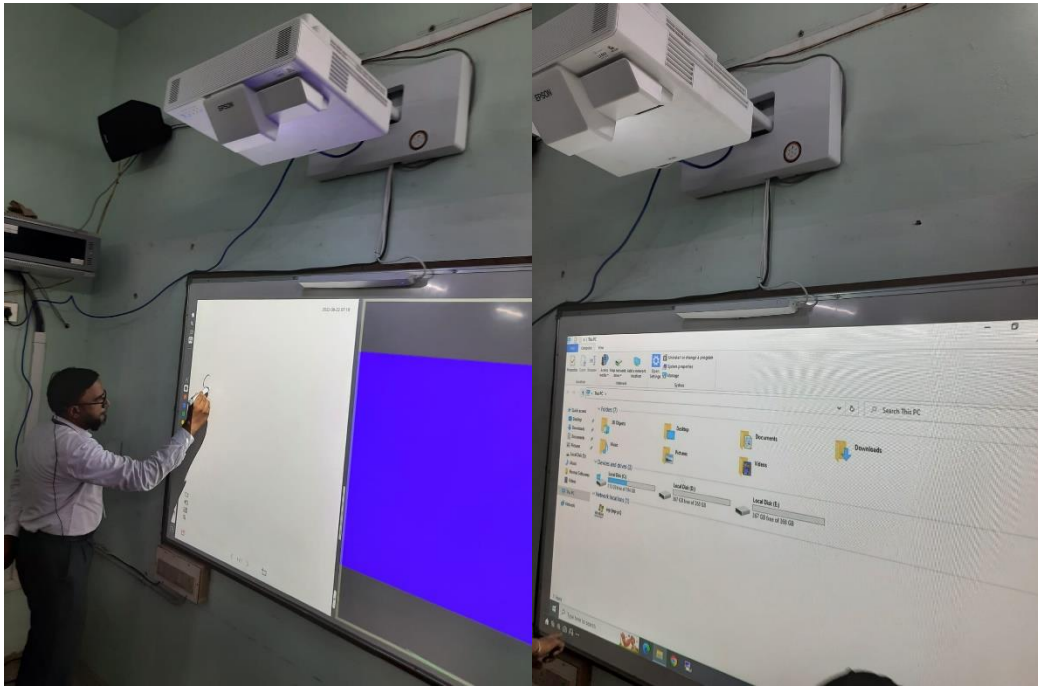
b) Books purchased

S. No	Academic Year	Department(s)	Books	Title	Amount (In Rs.)	Grand total (In Rs.)
1	2019 - 2020	Chemistry	6	4	17,793	17,793
1	2020 – 2021	Chemistry	2	2	18,079	32,401
2		Physics	10	8	14,322	
1	2021 - 2022	Botany	52	48	25,067	50,073
2		Zoology	53	49	25,006	
Total			123	111	1,00,267	1,00,267

c. Total expenditure for E-Learning class room and books

S. No	Purchased E-Learning Class Room and Books	Grand Total (In Rs.)
1	E - Learning Class Room	4,86,050
2	Books Purchased	1,00,267
Total	486050+100267	5,86,317

a. E-Learning class room



b. Books purchased



7. Details of Networking:

The amount sanctioned by DST for creating Networking facility in the campus is Rs. 7 lakhs (Rupees Seven Lakhs only). The total expenditure incurred for creating Networking facility is Rs. 7,13,950 (Rupees Seven Lakhs thirteen thousand and nine hundred fifty only). The excess amount Rs. 13, 950 (Rupees Thirteen Thousand nine hundred and fifty only) is adjusted from the balance amount sanctioned for infrastructure facility (refer para 2 in point number 5)

Campus is Wi-Fi enabled with 300 MBps broad band for the access by students and research scholars.

1. Total expenditure for Networking

S.No	Purchased Networking	Numbers	Grand Total (in Rs.)
01	Lenovo Tower Server ST50	01	7,13,950
02	Lenovo Desktop System – V50t 11HD0022IH	11	
03	Numeric ORFINITI5.0 Kva – 192DC	1	
Total			7,13,950

a. Networking facility



8. Utilization of the facilities created under FIST support:

- a. For teaching:** (*List the Classroom use of equipment and new experiments introduced, if any*).

Though theoretical courses in spectroscopy are prescribed in the UG and PG Programmes, due to the sophisticated nature and high cost of the FTIR, FT-Raman spectrometer, Binary HPLC and Atomic Absorption Spectrometer bought under DST-FIST support, no class room usage is included. However, the final year students of PG, M. Phil and Ph.D. Research Scholars are provided access to these instruments under the care and supervision of their guides.

- b. For research:** (*Identify the research programs, including names of groups or individual faculty members, who are using the major equipment (> 5 lakhs) acquired with the FIST support*)

Research in Molecular Spectroscopy is undertaken by Dr. R. Raj Muhamed and his research scholar Capt. F. S. Muzammil of Physics department. They make use of the facilities created under DST-FIST support to carry out their research activities. In Chemistry Department, the FTIR Alpha II instrument is more supportive for the research scholars of M.Phil., and Ph.D programmes. Dr. F. M. Mashood Ahamed and Dr. Syed Ali Padusha of Chemistry Department are working on these instruments and published research papers in the reputed journals. Dr. M. Seeni Mubarak, Dr. A. Jafar Ahamed and Dr. Syed Ali Padusha, Associate Professors of Chemistry are working on Structural determination of Organic molecules, nanomaterials and Inorganic materials respectively. For Botany department the installation of Binary HPLC instrument is more supportive for the research scholars of M.Phil., and Ph.D programmes. Dr. A. Shajahan and Dr. N. Ahamed Sherif of Botany Department are also pursuing research by the equipments mentioned above. In Zoology department, Atomic Absorption Spectrometer (AAS) instrument is used extensively by the research scholars of M.Phil., and Ph.D. programmes. Dr. A.Sadiq Bukhari, Dr. H.E.Syed Mohamed, Dr. M.Meeramaideen and Dr. R. Krishnamoorthy and other faculty members of the science departments are also actively participating in the research activities using the facilities purchased under DST-FIST support.

- 9. Details of full length research publications** (*in peer-reviewed journals*) during the period under report (**Annexure – II**)

10. **Sponsored research projects in operation during the period under report** (please provide name/s of PI/Co-PIs, title of the project, funding agency and total quantum of external support)

The Department of Biotechnology (DBT) has selected five science departments viz., Botany, Chemistry, Mathematics, Physics and Zoology under Star College Scheme - 2020 and sanctioned a grant of Rs.104 lakhs for the period of three years.

Documentation of Traditional Knowledge and grassroots innovations from foot Hills of Pachaimalai and Kolli Hills of Eastern Ghats of Tamil Nadu funded by National Innovation Foundation – DST, Government of India. Principal Investigator: Dr. A. Shajahan, Co-Principal Investigator: Dr. B. Balaguru, Grant: Rs. 4,73,400 (2020- 2021). Soybean crop improvement against drought by using endophytes – DST – SERB Government of India. Principal Investigator: Dr. R. Radhakrishnan Grant: Rs. 8,64,087 (2021- 2024)

11. Utilization of Equipment from outside the College

It has been decided by our college authorities to open up the facilities set up under DST-FIST support to be utilized by researchers from other institutions by paying a nominal fee. After the COVID – 19 Pandemic, these instruments are now available for the extensive use of research scholars from other institutions.

12. Self-Assessment of the impact of FIST support

(Please specify if any of the following activity emerged/ improved as a consequence of the FIST support:)

a. New class-room experiments at B.Sc./ M.Sc. or other levels

As the FTIR, FT-Raman spectrometer, Binary HPLC and Atomic Absorption Spectrometer instruments are costly, no experiments involving general usage of UG / PG students are introduced. However, the final year PG students can avail these facilities for their project work and M. Phil and Ph.D. scholars for the research studies.

b. Success of students at national level tests (various PG/Ph.D. entrance tests and tests for JRF etc.)

S.No	Name	Type of Test	Register No	Year	University	Subject
01	Habib Rahman	Ph.D. Entrance Test	2010061002	October - 2020	Bharathidasan University	Botany
02	Isa bin fakirull almaz	Ph.D. Entrance Test	2108061007	August - 2021	Bharathidasan University	Botany
03	Mohamed Yasar	Ph.D. Entrance Test	210206100	February - 2021	Bharathidasan University	botany
04	Perumal	Ph.D. Entrance Test	1902061007	February - 2019	Bharathidasan University	Botany
05	Perumal	CSIR-NET	TN14000903	2022	UGC-CSIR	Botany

06	T. Srinivasan	CSIR-NET	TN11600997	June - 2020	UGC-CSIR	Chemistry
07	Ashlin raj	Ph.D. Entrance Test	2203461039	March - 2022	Bharathidasan University	Zoology
08	Muhamed Munawwar	Ph.D. Entrance Test	2203461006	March - 2022	Bharathidasan University	Zoology
09	Mohammed Shahan	Ph.D. Entrance Test	2203461055	March - 2022	Bharathidasan University	Zoology
10	Muhamed Ramshad	Ph.D. Entrance Test	2203461047	March - 2022	Bharathidasan University	Zoology

c. Any new research project that emerged on the basis of the FIST support

The faculty members of the participating departments (Physics, Chemistry, Botany and Zoology) who are working on Molecular spectroscopy and Structural determination of new molecular entities are expected to submit the research proposals in this academic year to DST and DBT as major research projects by making use of these facilities.

d. Did the newly created facility lead to betterment of quality of research publications -

Yes. Newly created facility accelerated and improved the research quality of publications.

(Annexure – II)

e. Any training program/ workshop organized by the department during the period of report, especially those involving the newly created facility)

e (i). Demonstration on working of Binary HPLC

A lecture cum hands on training on HPLC was organized for the faculty members, research scholars and II M.Sc., students of P.G and Research Department of Botany in coordination with the Jamal Mohamed College Instrumentation Center “JAMIC” on 13.05.2022 (13th Friday 2022). The programme began with prayer Quirath rendered by Mr. S. Maheen Abubacker II M.Sc Botany who recited a few verses from the Holy Quran. The workshop was handled by Mr. R. Namashivayam, Waters Technical Engineer, Chennai, Tamil Nadu who explained the working principle of Waters Breeze QS HPLC system, Empower™ QS software and binary pump with PDA detector. Dr. N. Ahamed Sherif, Assistant Professor of Botany, Jamal Mohamed College elaborated on the practical aspects of HPLC such as solvent system, column types, sample quality and preparation methods, purging of column and observation of results for scientific interpretation for the research scholars and PG students.

Mr. S. Mohammed Yaser, Research Scholar, P.G and Research Department of Botany proposed the vote of thanks.



Breeze QS HPLC system with Photodiode Array Detector

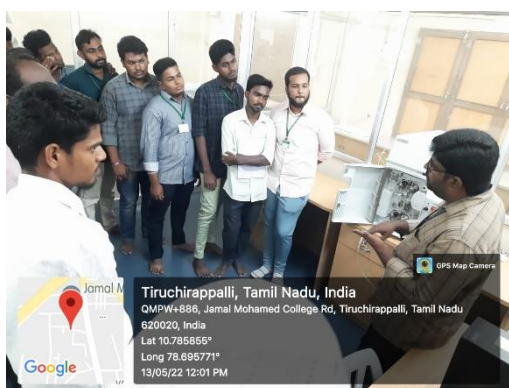
Make : Waters pacific Pte. Ltd
Model No : 1525
Detector : Photodiode Array Detector (PDA; 2998)



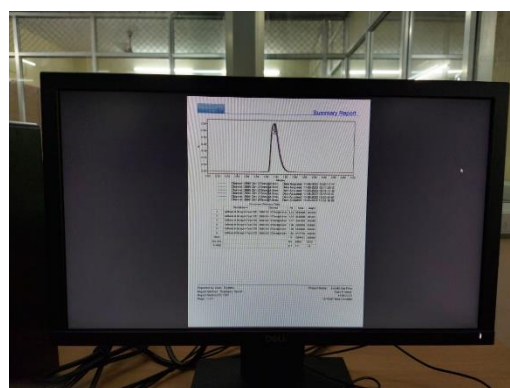
Mr. R. Namashivayam, Waters Technical Engineer installed HPLC system



Technical Engineer explained about the working principle of HPLC system to scholars



Dr. N. Ahamed Sherif, Assistant Professor of Botany explained the uses and importance of HPLC to M.Sc., students



Chromatogram of Caffeic Acid

e (ii). Workshop on FT-IR Spectrometer

The PG & Research Department of Chemistry, Jamal Mohamed College in coordination with the Jamal Instrumentation Center “JAMIC” was organized a One-Day workshop on Fourier Transform Infra Red Spectrometer (FT-IR spectrometer) on Monday, June 13th 2022. The workshop was inaugurated by Dr. A. Jafar Ahamed, Associate Professor of Chemistry, Jamal Mohamed College. He emphasised on the Principles of Fourier Transform Infra Red Spectrometer to the students. FT-IR spectrometer is used primarily to detect the functional groups present in the samples through the application of Infra Red radiation results vibrational motion. The absorption of IR radiation causes excitation of molecules from lower to higher vibrational levels, which is expressed in terms of wavelength or wave number and is plotted against percentage of transmittance. FT-IR takes advantage of identifying different types of bonds present in the molecule with respect to nature of elements and vibrations. Depending upon the modes of vibration and its intensity, specific functional group can be detected using OPUS software. It enables powerful data acquisition, manipulation and interpretation. Dr. M. Purushothaman, Assistant Professor of Chemistry, Jamal Mohamed College provided a step by step proper handling procedure and operation of the software with regards to obtaining the results as well as the appropriate way of managing the instrument. Bruker Alpha II FT-IR instrument presents an opportunity to prepare real-time samples with Diamond ATR and the interpretation of the subsequent data of the sample solutions were analyzed by the software. Furthermore doubts and queries of the students were addressed by Dr. M. Syed Ali Padusha, Associate professor of Chemistry, Jamal Mohamed College. Totally 55 participants including research scholars benefitted out of this workshop.



Participants observe the demonstration of working of infrared spectroscopy by Dr. A. Jafar Ahamed, Dr. M. Purusothaman and Dr. M. Syed Ali Padusha.

e (iii). Demonstration on working of MULTI RAM BRUKER FT-RAMAN Spectrometer

A Seminar on Raman Effect and Its Impact was conducted by the PG & Research Department of Physics, Jamal Mohamed College on 03-03-2022 at Physics Seminar Hall. Dr. M. Jamal Mohamed Jaffar, Associate Professor & Head, Department of Physics, Jamal Mohamed College (Autonomous), Tiruchirappalli welcomed the gathering and introduced the Resource Persons. The seminar was inaugurated by Dr. Gunasekaran. S. TANSA Awardee, Dean, Associate Professor and Head, Department of Physics, St.Peter's University. Dr. M. Selvapandiyar, Associate Professor and Head i/c, Department of Physics, Periyar University PG Extension Centre, Dharmapuri, acted as the resource person and explained the Principles of FT-Raman Spectrometer to the students.

Their operating principle is similar to that of FTIR spectrometer and is based on an interferometer. As the Raman-scattered light enters the instrument, the interferometer selectively modulates the individual spectral components by systematically changing an optical path length difference. The resulting beam of light is recorded by a point detector. FT-Raman is superior to a dispersive instrument in the near-IR region beyond 1000 nm. Commonly, the 1064 nm laser excitation along with germanium or indium gallium arsenide (InGaAs) detector is used. They also offer excellent wavelength accuracy and can potentially combine IR absorption and Raman measurement capacity in single instrument. However, FT-Raman frequently needs to use high laser intensities due to the reduced Raman scattering efficiency at longer wavelengths, which may damage the sample.

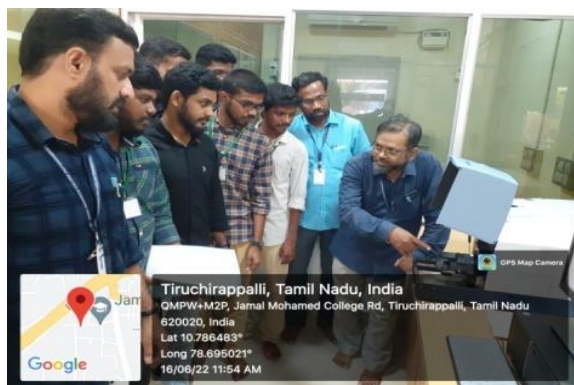
A hands on training program on Multi Ram Bruker FT-Raman Spectrometer was conducted by the PG & Research Department of Physics, Jamal Mohamed College in coordination with the Jamal Mohamed College Instrumentation Center "JAMIC" on Tuesday, June 16th 2022. The workshop was inaugurated by Dr. M. Jamal Mohamed Jaffar, Associate Professor and Head, Department of Physics, Jamal Mohamed College. Dr. A. Ishaq Ahamed, Associate Professor, Department of Physics, Jamal Mohamed College, who explained the Principles of FT-Raman Spectrometer to the students. Dr. A. Abbas Manthiri, Assistant Professor, Department of Physics, Jamal Mohamed College, provided with a step by step guide of proper handling and operation of the software with regard to obtaining the results as well as the appropriate way of managing the instrument. CCl₄ presents an opportunity to prepare real-time solution samples and the interpretation of the subsequent data of the sample solutions were analyzed with the help of the software.



Dr. Gunasekaran, Dean & Head, Department of Physics, St. Peter's University addresses at the inauguration



Dr. M. Selvapandiyan, Head i/c, Department of Physics, Periyar University PG Extension Centre, Dharmapuri speaks on principles of FT Raman spectroscopy

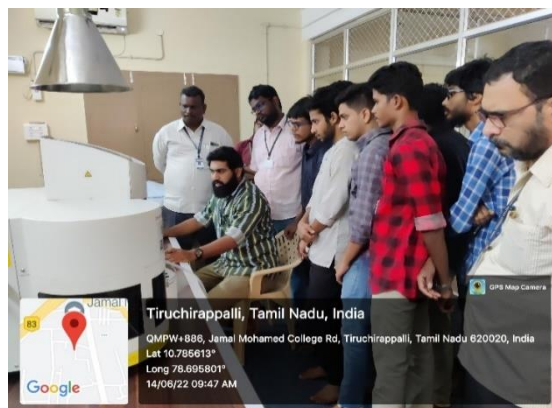
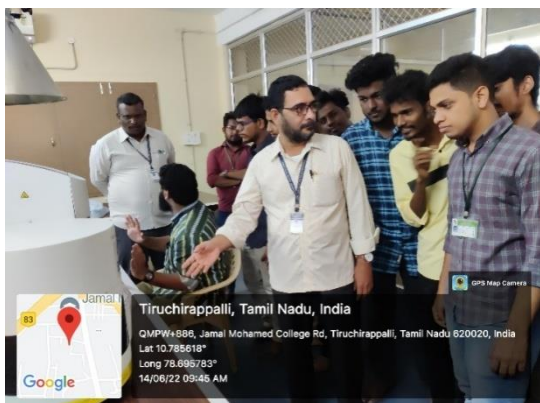


Participants keenly watching the demonstration of working of FT Raman

e (iv) **Demonstration on working of Atomic Absorption Spectrometer (AAS)**

One-Day workshop on Atomic Absorption Spectrometer (AAS) was conducted by the PG & Research Department Zoology, Jamal Mohamed College in coordination with the Jamal Mohamed College Instrumentation Center "JAMIC" on Tuesday, June 14th 2022. The workshop was inaugurated by Mr. Sheik Umar Sahith, Associate Professor of Zoology, Jamal Mohamed College. He acted as the resource person and introduced the Principles of Atomic Absorption Spectrometry to the students. Atomic Absorption Spectrometry (AAS) is used primarily to detect elements in solution samples through the application of characteristic wavelengths of electromagnetic radiation from a light source. Individual elements will absorb wavelengths differently, and this absorbance are measured against standards. In effect, AAS takes advantage of the different radiation wavelengths that are absorbed by different atoms. Depending upon the light wavelength and its intensity, specific elements can be detected and their concentrations can be measured using the Atomic Absorption Spectrometry software. It enables powerful data acquisition,

manipulation and interpretation. Mr. P A Ashique , Assistant Professor, Department of Zoology, Jamal Mohamed College provided with a step by step guide of proper handling and operation of the software with regards to obtaining the results as well as the appropriate way of managing the instrument. Participants had an opportunity to prepare real-time solution samples and the interpretation of the subsequent data of the sample solutions were analyzed with the help of the software. Further doubts and queries of the students were addressed by Dr. P Rajasekar Assistant Professor, Department of Zoology, Jamal Mohamed College.



Mr. Sheik Umar Sahith, Associate Professor of Zoology, Jamal Mohamed College, explains the working Principles of Atomic Absorption Spectrometry.

13. Is any problem faced in utilization of the grant/facilities?

We tried to procure the instruments HPLC and AAS through GeM portal. Being the government aided college we were not able to register in GeM portal as buyer. Regarding this communication has been sent to DST on 01. 12. 2021, 08. 12. 2021 and 03. 02. 2022. We have not received any reply from DST till the end of the financial year. Hence we place order through open tender by constituting a purchase committee comprising of experts from Bharathithasan University with which the college is affiliated.

A report highlighting the research activities of the College during the period under review may also be provided.

a. Atal Ranking of Institutions on Innovation Achievement (ARIIA) – 2021

Jamal Mohamed College is categorized as 'Band A' institution (Performer) in the category of 'Institutes & Colleges (Govt. and Govt. aided)' in Atal Ranking of Institutions on Innovation Achievement (ARIIA) 2021 announced on 29th December 2021.

b. The institution provides seed money for research and the following faculty members from DST FIST participating departments were selected for the seed money scheme.

S. No	Name of the teacher getting seed money	The amount of seed money (in Rs.)	Year of receiving grant
1	Dr. N. Ahamed Sherif Assistant Professor, Department of Botany	10,000	2020 - 2021
2	V.C. Archana Assistant Professor, Department of Fashion Technology & Costume Designing	10,000	2020 - 2021
3	Dr. R. Radhakrishnan Assistant Professor, Department of Botany	10,000	2020 - 2021
4	Dr. N. Mujafarkani Assistant Professor, Department of Chemistry	10,000	2020 - 2021
5	Dr. M. Angel Assistant Professor, Department of Nutrition & Dietetics	10,000	2020 - 2021
6	Dr. N. Asiffa Jabeen Assistant Professor, Department of Nutrition & Dietetics	10,000	2020 - 2021
7	Dr. M. Meeramaideen Assistant Professor, Department of Zoology	10,000	2021 - 2022
8	Dr. B. Arifa Farzana Assistant Professor, Department of Chemistry	10,000	2021 - 2022
9	Dr. A. Mushira Banu Assistant Professor, Department of Chemistry	10,000	2021 - 2022
10	Dr. S. S. Syed Abuthahir Assistant Professor, Department of Chemistry	10,000	2021 - 2022
11	Ms. B. Rajalakshmi Assistant Professor, Department of Nutrition & Dietetics	10,000	2021 - 2022
12	Dr. F. M. Mashood Assistant Professor, Department of Chemistry	10,000	2021 - 2022

13	Dr. A. Asrar Ahamed Assistant Professor, Department of Chemistry	10,000	2021 - 2022
14	Dr. B. Balguru Assistant Professor, Department of Botany	10,000	2021 - 2022
15	Dr. K. Sheik Fareeth, Assistant Professor, Department of Social Work	7,500	2021 - 2022
16	Dr. S. Rajeswari Assistant Professor, Department of Social Work	7,500	2021 - 2022
17	Dr. A. Prasanna Assistant Professor, Department of Mathematics	6,000	2021 - 2022
18	Dr. S. Mohamed Rabeek Assistant Professor, Department of Chemistry	7,500	2021 - 2022
19	Dr. H. Mohamed Kasim Shiet Assistant Professor, Department of Chemistry	7,500	2021 – 2022
20	Dr. M. Sirajudeen Assistant Professor, Department of Commerce	6,000	2021 - 2022
21	Dr. P. A. Ashique Assistant Professor, Department of Zoology	7,500	2021 - 2022
22	Dr. R. Abdul Vahith Assistant Professor, Department of Chemistry	7,500	2021 - 2022
23	Dr. S. Shek Dhavud Assistant Professor, Department of Physics	20,000	2021 - 2022

c. No of ongoing research projects per teacher funded by government and non-government agencies during the period.

Documentation of Traditional Knowledge and grassroots innovations from foot Hills of Pachaimalai and Kolli hills of Eastern Ghats of Tamil Nadu funded by National Innovation Foundation – DST, Government of India. Principal Investigator: Dr. A. Shajahan, Co-Principal Investigator: Dr. B. Balaguru, Grant: Rs. 4,73,400 (2020- 2021). Soybean crop improvement against drought by using endophytes – DST – SERB Government of India. Principal Investigator: Dr. R. Radhakrishnan Grant: Rs. 8,64,087 (2021- 2024)

S. No	Name of the Investigator	Amount sanctioned (in INR)	Funding Agency	Duration of the year
1	Dr. A. Shajahan Assistant Professor, Department of Botany	4,73,400	NIF-DST	2020 - 2022
2	Dr. R. Radhakrishnan Assistant Professor, Department of Botany	8,64,087	DST-SERB	2021 - 2024

d. Hands on experiments being conducted and invited lectures

- Analytical Separation Techniques** on 28-05-2020, Conducted by Dr. V. M. Biju, Associate Professor, Department of Chemistry, National Institute of Technology, Tiruchirappalli.
- A Virtual internship programme on Principle and Instrumentation of IR spectroscopy** on 24-06-2020 to 26-06-2020(Three Days), Conducted by Dr. P. Kalimuthu, Assistant Professor, Department of Chemistry, Gandhigram Rural Institute- Deemed to be University, Dindigul.
- A Virtual internship programme on the applications of Avagadro software** conducted by Dr. M. Arunachalam, Assistant Professor, Department of Chemistry, Gandhigram Rural Institute- Deemed to be University, Dindigul.
- A Virtual internship programme on the applications of Chemdraw software** conducted by Dr. M. Seenivasa Perumal, Assistant Professor, Department of Chemistry, Gandhigram Rural Institute- Deemed to be University, Dindigul.
- A Virtual internship programme on Principle and Instrumentation of UV Visible spectroscopy** conducted by Dr. P. Kalimuthu, Assistant Professor, Department of Chemistry, Gandhigram Rural Institute- Deemed to be University, Dindigul.
- SPSS**, conducted by Dr. M. Balasubramanian, Assistant Professor of Statistics, Periyar E.V.R College, Tiruchirappalli, on 17-02-2021 & 18-02-2021(Two Days).
- Hands on Training Programme on Maple Software** conducted by Mr. Mohamed Aslam Ameer Hamja, Data Science Enthusiast, Mindzcube, Bangalore & Dr. S. Mohamed Yusuff Ansari, Assistant Professor of Mathematics, Jamal Mohamed College, Tiruchirappalli, on 11-01-2021.
- Herbal Product Preparation** - Dr. M. Arumugam, Head, Dept. of Botany, JJ College of Arts and Science, Pudukkottai on 20-11-2021.

9. **An overview of UV-Visible Spectroscopy:** Applications in Day to Day Life-Dr. D. Suresh, Assistant Professor, School of Chemical and Biotechnology, SASTRA Deemed University, Thanjavur on 04-12-2021.
10. **Instrumentation of UV-Visible & IR Spectroscopy** - Dr. A. Kosiha & Dr. M. Devenderan, Asst. Professor of Chemistry & Scientific Officer, VELS Institute of Science and Technology, Chennai.
11. **Phytochemistry and its application** - Dr. N. Palaniyappan, Material Chemistry, RMIT University, Melbourne, Australia, delivered a lecture on 08.07.2020.
12. **Analytical separation techniques** - Dr. V. M. Biju, Associate Professor of Chemistry, National institute of technology, Tiruchirappalli, delivered a lecture on 28.05.2020.
13. **Strategies to identify medicinally potent compounds from plants** - Dr. V. S. Pragadheesh, Scientist, CSIR-CIMAP, Bangalore, delivered a lecture on 17.06.2020.
14. **Applications of sagemath software** - Dr. P. S. Srinivasan, Associate Professor of Mathematics, Bharathidasan University, Trichy delivered a lecture on 22. 09. 2020 and 23.09. 2020.

Annexure – I

Details of Books purchased

I.(i). Details of Books purchased during in the financial year 2019-2020

S.NO	Access No.	Title	Author	Price (In Rs.)
01	52000699	Physical Methods in Inorganic Chemistry	Drago, RussellS	236.00
02	52000700	Physical Methods in Inorganic Chemistry	Drago, RussellS	236.00
03	52000701	Spectrometric Identification of Organic compounds	Silverstein, RobertM	624.00
04	52000702	Infrared and Raman Spectra of Inorganic and Coordin	Naamoto, Kazuo	7648.50
05	52000703	Infrared and Raman Spectra of Inorganic and Coordin	Naamoto, Kazuo	7648.50
06	52000704	Instrumental Methods of Chemical Analysis	Chatwal, Gurdeep R	1400.00
Total amount for financial year 2019-2020				17,793.00

I.(ii). Details of Books purchased during in the financial year 2020-2021

S.NO	Access No.	Title	Author	Price (In Rs.)
01	52000705	Practical raman Spectroscopy	Browley,H.J	7321.28
02	52000706	Surface Infrared and Raman Spectroscopy: Methods	Suetaka,W	10757.72
03	52000707	IR and Raman Spectroscopy: Principles and Spectral I	Larkin,Peter j	7987.20
04	52000708	Molecular Structure and symmetry	Veera Reddy,K	799.20
05	52000709	Molecular Symmetry and Spectroscopy	Bunker,PhilipR	1080.00

06	52000710	Molecular Symmetry and Spectroscopy	Bunker,PhilipR	1080.00
07	52000711	Biomolecules	Devasena,T	176.00
08	52000712	Biomolecules	Devasena,T	176.00
09	52000713	Introduction to Magnetic Resonance Spectroscopy ES	Sathyanarayana, D N	796.00
10	52000714	Molecular and Atomic Spectroscopy	Wilfred Sugumar,R	476.00
11	52000715	Molecular Modeling and Drug Design	Anand Solomon,K	1276.00
12	52000716	Theoretical Spectroscopy	Mohan,S	476.00
Total amount for financial year 2020-2021				32,401.00

I.(iii). Details of Books purchased during in the financial year 2021-2022

S.NO	Access No.	Title	Author	Price (In Rs.)
01	52000742	Biophysics: Principles and Techniques	Subramanian, M A	340.00
02	52000743	Horticulture	Sheela, V.L	280.00
03	52000744	Pharmacognosy	Roseline, A	760.00
04	52000745	Research Methods: Tips and Techniques	Vijayalakshmi, G	200.00
05	52000746	Scientific Thesis Writing and Paper Presentation	Gurumani, N	600.00
06	52000747	Vermitechnology	Mary Violet Christy, A	316.00
07	52000748	Essence of Horticulture	Patil, M.S	476.00
08	52000775	Textbook of Botany Angiosperms	Pandey, B.P	520.00
09	52000776	College Botany	Pandey, B P	399.20
10	52000777	Botany for Degree Students	Pandey, B P	440.00
11	52000778	Botany for Degree Students Fungi	Vashishta, B R	440.00
12	52000779	Botany for Degree Students	Pandey, B P	420.00
13	52000780	Embryology of Anigiosperms	Bhojwani, S S	360.00

14	52000781	Principles of Environmental Science: Inquiry and Applications	Cunningham, William P	1596.00
15	52000782	Plant Virology	Hull, Roger	3199.60
16	52000783	Plant Biotechnology	Hussain, Anwar	1196.00
17	52000784	Devlins Exercises in Plant Physiology	Devlin, Robert M	396.00
18	52000785	Pest Control in Gardenng Plants	Aggarwal, B.S	316.00
19	52000786	Botany for Degree Students	Pandey, B.P	316.00
20	52000787	Botany for Degree Students Plant Ecology and Taxonomy	Pandey, B.P	260.00
21	52000788	Botany for Degree Students Plant Anatomy and Embryology	Pandey, B P	260.00
22	52000789	Botany for Degree Students Plant Physiology and Metabolism	Pandey, B P	212.00
23	52000790	Botany for Degree Students Gymnosperms	Vasishta, P C	399.20
24	52000791	Plant Anatomy	Pandey, B P	300.00
25	52000792	Fundamentals of Plant Physiology	Jain, V.K	420.00
26	52000793	Textbook of Botany	Pandey, S.N	460.00
27	52000794	Plant Physiology	Pandey, S.N	440.00
28	52000795	Botany for Degree Students Algae	Vashishta, B R	440.00
29	52000796	Botany for Degree Students Pteridophyta	Vashishta, P C	460.00
30	52000797	Taxonomy of Angiosperms	Pandey, B P	300.00
31	52000798	Soil Microbiology	Rao, Subba	476.00
32	52000799	Mineral Nutrition of Plants	Sood, B.S	476.00
33	52000800	Modern Practical Botany	Pandey, B.P	300.00
34	52000801	Botany for Degree Students	Pandey, B.P	428.00
35	52000802	Fundamentals of Plant Physiology	Jain, V.K	420.00
36	52000803	Genetics	Stansfield, William D	320.00
37	52000804	Textbook of Plant Ecology	Shukla, R.S	340.00

38	52000805	Textbook of Botany Angiosperms	Pandey, B.P	520.00
39	52000806	Objective Horticulture	singh, Neeraj Pratap	360.00
40	52000807	Biodiversity	William, M.N	580.00
41	52000808	Molecular Biology	Rastogi, S C	316.00
42	52000809	Bioinorganic Chemistry	Hussain Reddy, K	319.00
43	52000810	Principles and Procedures of Plant Protection	Chattopadhyay, S B	460.00
44	52000811	Wings of Fire: An Autobiography	Abdul Kalam, A P J	360.00
45	52000812	Wings of Fire: An Autobiography	Abdul Kalam, A P J	360.00
46	52000813	Wings of Fire: An Autobiography	Abdul Kalam, A P J	360.00
47	52000814	Wings of Fire: An Autobiography	Abdul Kalam, A P J	360.00
48	52000815	Wings of Fire: An Autobiography	Abdul Kalam, A P J	360.00
49	52000816	Fundamentals of Plant Physiology	Jain, V.K	420.00
50	52000817	Textbook of Plant Ecology	Shukla, R.S	340.00
51	52000818	Textbook of Botany Angiosperms	Pandey, B.P	520.00
52	52000819	Practical Botany	Bendre, Ashok M	150.00
53	52000717	Animal Biotechnology	Gupta, P K	540.00
54	52000718	Animal Behaviour	Mathur, Reena	540.00
55	52000719	Arthropoda	Kotpal, R L	144.00
56	52000720	Biotechnology and Genomics	Gupta, P K	452.00
57	52000721	Coelenterata	Kotpal, R L	108.00
58	52000722	Coelenterata	Kotpal, R L	108.00
59	52000723	Life science	Pushkar, Kumar	544.00
60	52000724	Life science	Pushkar, Kumar	544.00
61	52000725	Solved Papers Life Sciences	Editorial Board Pratiyogita Darpan	176.00
62	52000726	Developmental Biology	Sastry, K V	300.00

63	52000727	Developmental Biology	Sastry, K V	300.00
64	52000728	Echinodermata	Kotpal, R.L	108.00
65	52000729	Echinodermata	Kotpal, R L	108.00
66	52000730	Helminthes	Kotpal, R L	108.00
67	52000731	Helminthes	Kotpal, R L	108.00
68	52000732	Immunology	Lal, S S	500.00
69	52000733	Invertebrates Zoology	Kumar, Rajesh	476.00
70	52000734	Invertebrates Zoology	Kumar, Rajesh	476.00
71	52000735	Minor Phyla	Kotpal, R L	108.00
72	52000736	Invertebrates	Kotpal, R L	612.00
73	52000737	Invertebrates	Kotpal, R L	612.00
74	52000738	Porifera	Kotpal, R L	72.00
75	52000739	Porifera	Kotpal, R L	72.00
76	52000740	Practical Zoology (Invetebate)	Kotpal, R L	364.00
77	52000741	Protozoa	Kotpal, R L	156.00
78	52000749	Bioinstrumentation	Veerakumari, L	336.00
79	52000750	Open Secret for the cracking the Civil services Examination	Kumar, Ashok	200.00
80	52000751	GATE 2022 Life Sciences Solved Papers 2000-2021	Kumar, Prabhanshu	476.00
81	52000752	Handbook of Economic Zoology	Ahsan, Dr. Jawaid	140.00
82	52000753	Biostatistics	Rastogi Veer Bala	476.00
83	52000754	Zoology	Miller, Stephen A	1596.00
84	52000755	Animal Feeding and Nutrition	robbins, T	956.00
85	52000756	Parker and Haswell Textbook of Zoology Invertabrates	Rastogi, Veer Bala	796.00
86	52000757	Parker and Haswell Textbook of Zoology Invertabrates	Rastogi, Veer Bala	796.00
87	52000758	Biology of Chordates	Pandey, B N	796.00
88	52000759	Biology of non-Chordates	Mandal, Fatik Baran	520.00
89	52000760	Foundations of Embryology	Carlson, Bruce M	876.00
90	52000761	Research Methodology: Concepts and Cases	Chawla, Deepak	520.00

91	52000762	Dairy Cattle Feeding and Management	etgen, William M	636.00
92	52000763	Bioinformatics	Hodgman, Charlie	420.00
93	52000764	Excellent communicative English	Khera, Vijay Laxmi	440.00
94	52000765	Zoology for Degree Students	Agarwal, V.K	348.00
95	52000766	Zoology for Degree Students	Agarwal, V K	399.00
96	52000767	Zoology for Degree Students	Agarwal, V.K	420.00
97	52000768	Zoology for Degree Students	Agarwal, V K	399.00
98	52000769	Zoology for Degree Students	Agarwal, V K	680.00
99	52000770	Cell Biology	Verma, P S	600.00
100	52000771	Invertebrate Zoology	Jordan, E L	680.00
101	52000772	Chordate Zoology	Jordan, E L	520.00
102	52000773	Modern Zoology	Balwan, Dr. Wahied KHawar Balwan	1916.00
103	52000774	Primer of Biostatistics	Glantz, Stanton A	956.00
104	52000820	Textbook of Zoology	Ghose, K.C	280.00
105	52000821	Solved Papers Life Sciences	Editorial Board Pratiyogita Darpan	192.00
Total amount for financial year 2021-2022				50,073.00

Annexure - II

Publications (Scopus indexed)/Patents, if any

(i) Department of Botany

1. M. Ghouse Basha, 2021, Biocidal chitosan-magnesium oxide nanoparticles via a green precipitation process, *Journal of Hazardous Materials*. Volume 411, 5 June 2021, 124884, <https://doi.org/10.1016/j.jhazmat.2020.124884>.
2. H. Syed Jahangir, 2020, Green Synthesis, Characterization and Antibacterial Studies of Silver (Ag) and Zinc Oxide (Zno) Nanoparticles, *Journal of pure and applied microbiology, J Pure Appl Microbiol.* 2020;14(3):1999-2008 | Article Number: 6199 <https://doi.org/10.22207/JPAM.14.3.39>.
3. H. Syed Jahangir, 2021, Biodegradation and Characterization of *Streptomyces* sp. (JMCACA3) from Acid Corroded Iron Plate, *Current Microbiology*, DOI: [10.1007/s00284-021-02374-3](https://doi.org/10.1007/s00284-021-02374-3)
4. N. Ahamed Sherif, 2020, DNA barcoding and genetic fidelity assessment of micro propagated *Aenhenrya rotundifolia* (Blatt.) C.S. Kumar and F.N. Rasm.: a critically endangered jewel orchid, *Physiology and Molecular Biology of Plants*, December 2020, *Physiology and Molecular Biology of Plants* 26(12) DOI:[10.1007/s12298-020-00917-9](https://doi.org/10.1007/s12298-020-00917-9).
5. R. Radhakrishnan, 2020, Combined *in vitro* and *in silico* approach to evaluate the inhibitory potential of an underutilized allium vegetable and its pharmacologically active compounds on multidrug resistant *Candida* species, *Saudi Journal of Biological Sciences*, <https://doi.org/10.1016/j.sjbs.2020.11.082>
6. Ramalingam Radhakrishnan, An Updated on Biosynthesis and regulation of carotenoids in plants. *South African Journal of Botany*.140:290-302 DOI:[10.1016/j.sajb.2020.05.015](https://doi.org/10.1016/j.sajb.2020.05.015)
7. Aslam, A., & Shajahan, A. (2021). An improved liquid Culture System for Efficient Shoot Multiplication in *Aerva lanata* (L.) Juss. Ex Schult. *Plant Tissue Culture and Biotechnology*, 31(1), 35–42. <https://doi.org/10.3329/ptcb.v31i1.54109>
8. Ghouse Basha, M. 2021. Direct plant regeneration from mature nodal explants of *Andrographis echinoides* (L.) Nees – a valuable medicinal plant, *Plant Archives* Vol. 21, 1, 2021 pp. 1842-1848
9. Shajahan, A., 2021. Calcium-alginate coated synthetic seed production, storage and assessment of genetic stability in *(L.) Willd.*, *Vegetos* . 1-7 DOI:[10.9734/ijpss/2021/v33i1830594](https://doi.org/10.9734/ijpss/2021/v33i1830594)
10. Radhakrishnan R., Influence of Endophytic Bacterium, *Cellulosimicrobium* sp. FRR2 on Plant Growth of *Amaranthus campestris* L. and Bacterial Survival at Adverse Environmental Conditions. *J Pure Appl Microbiol.* 2021;15(4):2288-2294. doi: [10.22207/JPAM.15.4.51](https://doi.org/10.22207/JPAM.15.4.51)
11. Vidya N, Saravanan K, Halka J, Kowsalya K, Preetha J.S.Y, Gurusaravanan P, Radhakrishnan R, Nanthini U.A.R and M. Arun. 2021. An insight into *in vitro* strategies for bioproduction of isoflavones. *Plant Biotechnology Reports* 15, 717-740 DOI: [10.1007/s11816-021-00711-3](https://doi.org/10.1007/s11816-021-00711-3)
12. Ramalingam Radhakrishnan, , 2021. An endophyte *Paenibacillus dendritiformis* strain APL3 promotes *Amaranthus polygonoides* L. sprout growth and their extract inhibits, food-borne pathogens. *Plant science today* 8(1):941-947. doi.org/10.14719/pst.2021.8.4.1259
13. Ghouse Basha, M. (2021). Floristic study on angiosperms surrounding the medavakkam lake, Chengalpattu district, tamil nadu, india. *Plant archives*. 21(1).271. doi.org/10.51470/PLANTARCHIVES
14. Balaguru, B. 2021. *Solanum pulneyensis* Soosairaj, sp. nov. (Solanaceae) from Palani Hills National Park of Tamil Nadu, India, *ADANSONIA* 43 (21) - PAGES 235-240 DOI:[10.5252/adansonia2021v43a21](https://doi.org/10.5252/adansonia2021v43a21)

15. Sathishkumar, R., 2021. In vitro assessment of antioxidant and anticancer activities of *Capparis zeylanica* L. leaf extracts against human breast cancer (MCF -7) International Journal of Botany Studies, 6(6):1301-1305.
16. Ghouse Basha, M. and Mahaboob Khan Shareef Khan, 2022. In vitro regeneration of shoot and roots of the wild folkloric medicinal plant *Ammannia baccifera* L. via indirect organogenesis from leaf explant cultures, Research Journal of Biotechnology, 17(3) 48-54
17. Sathish Kumar, R., 2022. Phytochemical analysis and in vitro cytotoxic assay of *Capparis zeylanica* L. fruit extract. Zeichen Journal. 8(4): 305-314

(ii) Department of Chemistry

I. Patents filed.

1. Dr. S. Mohamed Rabeek & Dr. A. Samsath Begum has filed a patent on “Design and Biological study on new Anti-inflammatory hybrid derivatives”. Application No. 202241006304; Publication date: 11-02-2022.
2. Dr. S. Farook Basha & Dr. R. Arulnangai has filed a patent on “Nanomaterial Based Thermal Indicator”. Application No. 202211010905; Publication date: 11-03-2022.
3. Dr. A. Mushira Banu has filed a patent on Novel carbon dots derived *Beta vulgaris* as potential anti-cancer and antioxidant agents. Application No. 202241030127; Publication date: 03-06-2022.
4. Dr. F. M. Mashood Ahamed has filed a patent on “Novel Methyl A-D-Rhamnopyranoside Analogues Against Anthrax: Molecular Dynamics Simulations, Molecular Docking, Density Functional Theory, And Admet studies”. Application No. 202211025776; Publication date: 06-05-2022.

II. Publications

1. Syed Ali Padusha and Mashood Ahmad, (2022) Molecular Structure determination, spectroscopic, quantum computational studies and molecular docking of 4-(E)-[2-(benzylamino)phenylimino] methyl-2] ethoxy phenol. <https://doi.org/10.1080/07391102.2022.2052354>
2. F. M. Mashood Ahmad, (2022) Structural, vibrational spectroscopy, molecular docking, DFT studies and antibacterial activity of (E)-N1-(3-chlorobenzylidene) benzene-1,2-diamine. <https://doi.org/10.1080/07391102.2022.2106516>
3. M. Mohamed Sihabudeen, 2021, Seasonal Variations in Physicochemical Parameters of Groundwater near Thamirabharani River Band in Tirunelveli District, Tamilnadu, India, International Journal of Biology, Pharmacy and Allied Sciences.; 10(11): 289-295. <https://doi.org/10.31032/IJBPAS/2021/10.11.1025>.
4. M. Mohamed Sihabudeen, 2021, Study of Heavy metal pollution in ground water near proximity of Thamirabharani River, Tamilnadu, India, International Journal of Biology, Pharmacy and Allied Sciences.; 10(11): 296-304. <https://doi.org/10.31032/IJBPAS/2021/10.11.1026025>.
5. Jafar Ahamed, 2022, Synthesis and effective performance of Photocatalytic and Antimicrobial activities of *Bauhinia tomentosa* Linn plants using of gold nanoparticles, Optical Materials, 123, 111945, <https://doi.org/10.1016/j.optmat.2021.111945>.
6. Jafar Ahamed, 2021, Facile synthesis and characterization of W-doped TiO₂ nanoparticles:
7. Promising anticancer activity with high selectivity, Inorganic Chemistry Communications, 120, 108140, <https://doi.org/10.1016/j.inoche.2020.108140>
8. M Syed Ali Padusha, 2021, Synthesis, Characterization, Crystal structure of 4-(4-Bromophenyl)-2,6-dimethyl-1,4-dihydro-pyridine-3,5-dicarboxylic acid diethyl ester: Hirshfeld surface analysis and DFT calculations, Egyptian Journal of Chemistry, [doi.10.21608/EJCHEM.2021.74007.3667](https://doi.org/10.21608/EJCHEM.2021.74007.3667).

9. M Syed Ali Padusha November 2021, Synthesis, crystal structure, DFT calculations and antimicrobial activity of 4-(4-Fluoro-phenyl)-2,6-dimethyl-1,4-dihydro-pyridine-3,5-dicarboxylic acid diethyl ester Egyptian Journal of Chemistry [10.21608/EJCHEM.2021.74007.3667](https://doi.org/10.21608/EJCHEM.2021.74007.3667)
10. M Syed Ali Padusha, 2022 Spectroscopic analysis, DFT studies and molecular docking of 2,3-dichloro-benzylidene-(2-trifluoromethyl-phenol)-amine, Vietnam J. Chem., [60\(1\)](https://doi.org/10.1002/vjch.202100077), 2022, 49-69, <https://doi.org/10.1002/vjch.202100077>
11. Zahir Hussain. 2021, Antimicrobial and antioxidant activity of *Andrographis echinoides* (L.) Nees extracts. International Journal of Biology, Pharmacy and Allied Sciences, 10(11): 01-15, <https://doi.org/10.31032/IJBPAS/2021/10.11.1001>.
12. Zahir Hussain November, 2021, Antimicrobial and antioxidant activity of *Anisomelesmalabarica* (L.) R. Br extracts. International Journal of Biology, Pharmacy and Allied Sciences, 10(11): 16-30, <https://doi.org/10.31032/IJBPAS/2021/10.11.1002>.
13. S. K. Periyasamy 2021, Evaluation of Antimicrobial and Antioxidant activities of selected medicinal plants, Bulletin of Environment, Pharmacology and Life Sciences, [341](https://doi.org/10.1016/j.molliq.2021.117340), 1, 117340. <https://doi.org/10.1016/j.molliq.2021.117340>.
14. S. K. Periyasamy, May 2022, Molecular Docking Analysis for the Identification of Bioactive Compounds Against Urolithiasis (Hyperoxaluria), ORIENTAL JOURNAL OF CHEMISTRY., 38(2), 336-342. <http://dx.doi.org/10.13005/ojc/380214>.
15. S. S. Syed Abuthahir, 2021, Corrosion inhibition of mild steel in 0.5M H₂SO₄ solution by plant extract of *Annona Squamosa*, Asian Journal of Chemistry, 33(9), 2219-2228, <https://doi.org/10.14233/ajchem.2021.23386>.
16. S. S. Syed Abuthahir, 2021, Inhibition of mild steel corrosion in 0.5 M sulfuric acid by an aqueous extract of leaves of *Tectona grandis* L. Plant, [International Journal of corrosion and scale inhibition](https://doi.org/10.17675/2305-6894-2020-10-4-10), [10.17675/2305-6894-2020-10-4-10](https://doi.org/10.17675/2305-6894-2020-10-4-10).
17. S. Syed Abuthahir, 2021, Corrosion inhibition effect of 2-[(2-Mercapto phenylimino) methyl] benzoic acid for mild steel in simulated concrete pore solution, International Journal of Biology, Pharmacy and Allied Sciences, 10(11): 198-215, <https://doi.org/10.31032/IJBPAS/2021/10.11.1015>
18. S. S. Syed Abuthahir, 2021, Inhibition of corrosion of carbon steel in hydrochloric acid by aqueous leaves extract of *Oxalis Corniculata* Linn (OCLP), [International Journal of Biology, Pharmacy and Allied Sciences](https://doi.org/10.31032/IJBPAS/2021/10.11.1016), 10(11): 216-232, <https://doi.org/10.31032/IJBPAS/2021/10.11.1016>
19. S. S. Syed Abuthahir, 2021, Study of heavy metal pollution in ground water near proximity of Thamirabharani River, Tamil Nadu, India, [International Journal of Biology, Pharmacy and Allied Sciences](https://doi.org/10.31032/IJBPAS/2021/10.11.1026), 10(11): 296-304, <https://doi.org/10.31032/IJBPAS/2021/10.11.1026>.
20. S. S. Syed Abuthahir, 2021, Corrosion inhibition of carbon steel using dipropyl sulphide as inhibitor system in sulphuric acid solution, Asian Journal of Chemistry, 33(12), 3115-3122, <https://doi.org/10.14233/ajchem.2021.23515>
21. S. S. Syed Abuthahir, 2021, Corrosion inhibition effect of an aqueous extract of *Oxalis Acetulosa* plant leaves on mild steel immersed in 1M Hydrochloric Acid, [International Journal of Biology, Pharmacy and Allied Sciences](https://doi.org/10.31032/IJBPAS/2021/10.11.1128), 10(11): 1478-1496, <https://doi.org/10.31032/IJBPAS/2021/10.11.1128>.
22. S. S. Syed Abuthahir, 2021, Corrosion Resistance of Carbon Steel Immersed in Simulated Concrete Pore Solution in the Presence of Amino Benzoic Acid, Biosc. Biotech. Res. Comm. 14 (07), 481-488. doi: <http://dx.doi.org/10.21786/bbrc/14.7.99>
23. M. Syed Ali Padusha, 2020, Synthesis, quantum chemical calculations and molecular docking studies of 2-ethoxy-4-[(2-trifluoromethyl-phenylimino)methyl]phenol, Molecular Physics, <https://doi.org/10.1080/00268976.2020.1781945>.

24. M. Syed Ali Padusha1, (2020). Synthesis, Characterization and Antimicrobial Studies Of some Azomethine Compounds Derived Via Schiff Base Condensation Chemistry . *Journal of Natural Remedies*, 21(7(S2), 84- 100.
25. R.Abdul Vahith, 2021, *Spilanthus acmella* leaves extract for corrosion inhibition in acid medium, *Coatings*– MDPI, <https://doi.org/10.3390/coatings11010106>
26. R. Mohamed Abdul Vahith , 2021, *Spilanthus acmella* Leaves Extract for Corrosion Inhibition in Acid Medium, *Coatings* – MDPI, *Coatings* 11, 106. <https://doi.org/10.3390/coatings11010106>
27. M. Mohamed Sihabudeen., 2020, Influence of physico chemical parameters on potability of ground water in ariyalur area of Tamil Nadu, India, *Materials Today: Proceedings*, <http://dx.doi.org/10.1016/j.matpr.2020.07.033>.
28. S.K. Periyasamy, 2020. Cooxidation of Dibenzalacetone with Oxalic Acid by Pyrazinium Chlorochromate, *International Letters of Chemistry, Physics and Astronomy*, 2020. Vol. 85, pp. 1-14, <https://doi.org/10.18052 / www.scipress.com /ILCPA.85.1>
29. M. Mohamed Sihabudeen. (2020). Interpretation of groundwater quality using piper diagram in and around ariyalur district Tamilnadu, India . *Journal of Natural Remedies*, 21(8(1),193-198.
30. M. Syed Ali Padusha, Fabrication of Sustained Release System of Electrospun Poly(acrylic acid)/Dextran Nanofibers Using Emulsion Electrospinning as Wound Dressing Applications, *Journal of Nanoscience and Nanotechnology*, 2021. *J Nanosci Nanotechnol.* 2021 Mar 1;21(3):1613-1622. doi: [10.1166/jnn.2021.18987](https://doi.org/10.1166/jnn.2021.18987)

(iii) Department of Computer

1. Dr. G. Ravi, 2021, Performance Analysis of the Normalized Distribution and Ranking with Optimization Based Task Scheduling Techniques, *Annals of the Romanian Society for Cell Biology*, ISSN: 1583-6258. <https://www.annalsofrscb.ro/index.php/journal/article/view/5109>.
2. Dr. G. Ravi, 2021, Enhanced Graph-Based Method in Spectral Partitioning Segmentation Using Homogeneous Optimum Cut Algorithm with Boundary Segmentation, *International Conference for Emerging Technology (INCET)*. [https://uwaterloo.ca/vision-image-processing-lab/sites/ca.vision-image-processing-lab/sites/ca.vision-image-processing-lab/files/2021-05/INCET2021-Enhanced-Graph-Based-Method-in-Spectral-Partitioning-Segmentation-Using-Homogeneous-Optimum-Cut-Algorithm-with-Boundary-Segmentation.pdf](https://uwaterloo.ca/vision-image-processing-lab/sites/ca.vision-image-processing-lab/sites/ca.vision-image-processing-lab/sites/ca.vision-image-processing-lab/files/2021-05/INCET2021-Enhanced-Graph-Based-Method-in-Spectral-Partitioning-Segmentation-Using-Homogeneous-Optimum-Cut-Algorithm-with-Boundary-Segmentation.pdf)
3. Dr. G. Ravi, 2021, Content Based Medical Image Retrieval System Based on Multi Model Clustering Segmentation and Multi-Layer Perception Classification Methods *Turkish Online Journal of Qualitative Inquiry (TOJQI)*, ISSN 3041-3052. <https://www.tojqi.net/index.php/journal/article/view/4228>.
4. Dr. D.I George Amalarethnam 2021, CHS_QoS: Cluster Head Selection using QoS properties in Heterogenic IoT based WSN,. *Malaya Journal of Matematik*, ISBN 2319-786. <https://core.ac.uk/download/pdf/290493309.pdf>.
5. Dr. D.I George Amalarethnam 2021, A Technique to MAGCIPHER for Applying adate Protection Strategy in Hybrid Cloud, *Malaya Journal of Matematik*, ISSN:2319-786.
6. Dr. D.I George Amalarethnam 2021, MPCR_QoS: Multi-Path Constraint based Routing for Improving QoS in IoT Network, *International Journal of Design Engineering*, ISSN:1751-5882 <https://ijettjournal.org/archive/ijett-v69i3p211>.
7. Dr. D.I George Amalarethnam 2021 Enhanced Quality of Service Strategy for improving network coverage in IOT Applications, *Journal of University of Shanghai for Science and Technology*, ISSN:1007-6735. <https://jusst.org/enhanced-quality-of-service-strategy-for-improving-network-coverage-in-iot-applications/>

8. Dr. D.I George Amalarethnam2021, An Enhanced Convergent Key Generation Algorithm for Securing Data in Hybrid Cloud, Vidyabharati International Interdisciplinary Research Journal (Special Issue),ISSN 2319-4979,
9. Dr. T. Abdul Razak ,2020, Application of Bayesian Approach To Decision Tree Algorithm For Classification of Soil Types, International Journal of Advanced Research in Engineering and Technology [IJARET], ISSN 0976-6480.https://iaeme.com/MasterAdmin/Journal_uploads/IJARET/VOLUME_11_ISSUE_8/IJARET_11_08_079.pdf
10. Dr. T. Abdul Razak ,2020, Application of Ensemble Learning Approach To Decision Tree Algorithm For Classification of Soil Types, Journal of Maharaja Sayajirao University of Baroda,ISSN 0025-0422.https://www.academia.edu/49475865/APPLICATION_OF_BAYESIAN_APPROACH_TO_DECISION_TREE_ALGORITHM_FOR_CLASSIFICATION_OF_SOIL_TYPES.
11. Dr. T. Abdul Razak,2021, Ensemble Learning Approach To Decision Tree Algorithm for the Classification of Soil Type and Suggesting, Journal of Fundamental & Comparative Research,https://www.researchgate.net/publication/348108977_A_novel_approach_for_classification_of_soils_based_on_laboratory_tests_using_Adaboost_Tree_and_ANN_modeling
12. Dr. T. Abdul Razak,2022, Suitable Crop Cultivation using Machine Learning Technique, Shodha Prabha,ISSN 0974-8946,[file:///C:/Users/staff/Downloads/Algebric5+\(1\)+\(1\).pdf](file:///C:/Users/staff/Downloads/Algebric5+(1)+(1).pdf)
13. Dr. T. Abdul Razak,2022, Implementation of Multilayer Neural Network with Decision Tree Model for Classification of Soil Type and suggesting suitable Crop Cultivation using Machine Learning Technique, Journal of Fundamental & Comparative Research,ISSN 2277 – 7067.<https://publishoa.com/index.php/journal/article/view/526>
14. Dr. T. Abdul Razak,2022, Cardiac disease detection from ECG signal using discrete wavelet transform with machine learning method, Diabetes Research and Clinical Practice, Elsevier, 0168 – 8227.<https://www.sciencedirect.com/science/article/abs/pii/S0168822722006647>
15. Dr. M. Mohamed Surputheen,2021. A MapReduce Cloud Service For Cocurrent VM Configuration In Cloud Environments, Sambodhi Journal,ISSN 2249-661.<https://cloud.google.com/compute/docs/instances/create-start-instance>
16. Dr. M. Mohamed Surputheen,2021. Psychotic Motivation for Improving Student Performance Based On Pattern Learner Features Using Deep Neural Classifier for Bipolar Disorder Students, Journal of Contemporary Issues in Business and Government,ISSN 1667.https://cibgp.com/article_10873_0e2b31a6544dd8d51d017d7756c0f832.pdf
17. .Dr. M. Mohamed Surputheen,2021A Predictive Model to identify possible affected Bipolar disorder students using Naïve Baye’s, Random Forest and SVM machine learning techniques of data mining and Building a Sequential Deep Learning Model using Keras, International Journal of Computer Science and Network Security, e-ISSN 1309-4653.http://paper.ijcsns.org/07_book/202105/20210536.pdf
18. .Dr. M. Mohamed Surputheen,2021, Novel Two-Level Randomized Sector-Based Routing To Maintain Source Location Privacy in WSN For IoT, Journal of the Maharaja Sayajirao University of Baroda, ISSN: 0025-0422.<https://koreascience.kr/article/JAKO202213341692817.pdf>.
19. .Dr. M. Mohamed Surputheen,2022, CADRAM – Cooperative Agents Dynamic Resource Allocation and Monitoring in Cloud Computing, IJCSNS International Journal of Computer Science and Network Security,ISSN 24901.http://paper.ijcsns.org/07_book/202203/20220313.pdf.
20. .Dr. M. Mohamed Surputheen,2022 Prediction of Academic Performance of College Students with Bipolar Disorder using different Deep learning and Machine learning algorithms, IJCSNS International Journal of Computer Science and Network Security,ISSN 24901.http://ijcsns.org/07_book/html/202107/202107040.html.

21. .Dr. M. Mohamed Surputheen,2022, Lung Cancer Image Approaches in Different Stages of Tumor Detection in Segmentation and Classification of Non-Smokers by CNN, International Journal of Innovative Research in Computer and Communication Engineering,https://www.researchgate.net/publication/343973920_Lung_Cancer_Prediction_and_Detection_Using_Image_Processing_Mechanisms_An_Overview
22. .Dr. M. Mohamed Surputheen,2022, Novel Two-Level Randomized Sector-based Routing to Maintain Source Location Privacy in WSN for IOT, IJCSNS International Journal of Computer Science and Network Security,ISSN 24901.http://paper.ijcsns.org/07_book/202203/20220337.pdf.
23. Dr. M. Mohamed Surputheen,2022, Non-Smokers' Lung Cancer Bio-Images Detection using Deep Learning Approach, IJCSNS International Journal of Computer Science and Network Security,ISSN 24901.http://paper.ijcsns.org/07_book/202203/20220353.pdf.
24. Dr. M. Mohamed Surputheen,2022, Iterative Dichotomiser Maximum Posteriori Active Selection Algorithm for analysis of coma patient's brain waves through WSN, SN Computer Science.<https://researchr.org/publication/NazarS22>.
25. Mr. M. Abdullah,2021, Agent Based Energy Utilization Cognizant Resource Scheduling in Cloud Computing, Science, Technology and Development Journal, ISSN 0950-0707.<http://journalstd.com/gallery/15-july2020.pdf>.
26. Mr. M. Abdullah,2021, A CADRAM – Cooperative Agents Dynamic Resource Allocation and Monitoring in Cloud Computing, IJCSNS International Journal of Computer Science and Network Security,ISSN 24901. http://paper.ijcsns.org/07_book/202203/20220313.pdf
27. Mr. S. Syed Ibrahim,2021, Enhanced Graph-Based Method in Spectral Partitioning Segmentation Using Homogeneous Optimum Cut Algorithm with Boundary Segmentation, International Conference for Emerging Technology (INCET),https://www.researchgate.net/publication/267987993_A_Review_on_Graph_Based_Segmentation
28. Mr. B. Mohamed Faize Basha,2022, Non Smokers Lung Cancer Bio-Images Detection Using Deep Learning Approach, IJCSNS – International Journal of Computer Science and Network Security.http://paper.ijcsns.org/07_book/202203/20220353.pdf
29. Mr. S. Peerbasha,2021, Prediction of Academic Performance of College Students with Bipolar Disorder using different Deep learning and Machine learning algorithms, IJCSNS International Journal of Computer Science and Network Security,ISSN. 24901.http://ijcsns.org/07_book/html/202107/202107040.html

(iv) Department of Mathematics

I. Patent filed:

1. A. Prasanna,2022, Machine learning analytics for specialized stock trading, the patent office journal, pp: 4341(Indian Patent Filed-Application No.202211002430A)

II. Publication:

1. A.Nagoor Gani, T.Shiek Pareeth, 2021, Solving Fuzzy Multi-objective Linear Sum Assignment Problem with Modified Partial Primal Solution of ω -type-2 Diamond Fuzzy Numbers by Using Linguistic Variables, Advances in Dynamical Systems and Applications, pp: 1499-1514, <https://www.ripublication.com/adsa21/v16n2p80.pdf>
2. N. Mohamed Thoiyab, P.Muruganantham, New Global Asymptotic Robust Stability of Dynamical Delayed Neural Networks via Intervalized Interconnection Matrices, IEEE Transactions on Cybernetics, [DOI:10.1109/TCYB.2021.3079423](https://doi.org/10.1109/TCYB.2021.3079423)
3. N. Mohamed Thoiyab, P.Muruganantham, 2021, Novel results on global stability analysis for multiple time-delayed BAM neural networks under parameter uncertainties, [Chaos, Solitons & Fractals, https://doi.org/10.1016/j.chaos.2021.111441](https://doi.org/10.1016/j.chaos.2021.111441)

4. A. Prasanna, M. Premkumar, P.Sugapriya, M.Kannan and A.Arul Staline, 2021, On $\kappa - Q$ -Anti Fuzzy Normed Rings, Design Engineering, pp: 8513–8519, <http://thedesigengineering.com/index.php/DE/article/view/5894>
5. M. Premkumar , M. Bhuvanewari, E. Manikandan and Dr. A. Prasanna, 2021, Fundamental Algebraic Properties on $\kappa - Q -$ Anti Fuzzy Normed Prime Ideal and $\kappa - Q -$ Anti Fuzzy Normed Maximal Ideal, Turkish Online Journal of Qualitative Inquiry, pp: 6895-6900, <https://www.tojqi.net/index.php/journal/article/view/7496>
6. A.Prasanna , M. Premkumar , K. Malathi , P. Sugapriya and A. Arul Staline, 2021, A Study on Complex Anti Fuzzy Subring, Advances in Mechanics, 1043-1050, <https://www.advancesinmechanics.com/1043.php>
7. M. Premkumar , A. Prasanna, Amit Kumar Sharma, M. S. Karuna, Arvind Sharma and Moti Lal Rinawa, 2021, On Fundamental Algebraic Attributes of $\omega - Q -$ Fuzzy Subring, Normal Subring and Ideal, International Journal of Mechanical Engineering, pp: 2062-2067, https://kalaharijournals.com/resources/DEC_273.pdf
8. M. Premkumar , Padmakar Shahare, A. Prasanna , Fithriyah Indah Nur Abida and M. Dhivya, 2022, On Product of Complex Anti Fuzzy Subring, International Journal of Special Education,pp:41984204,<https://internationaljournalofspecialeducation.com/submission/index.php/ijse/article/view/636/454>
9. Jahir hussain,2021, prime edge magic labeling for some graphs, Advances and Applications in Mathematical Sciences pp: 1093-1100. <http://surl.li/cdhop>
10. Mohamed Althaf, 2021, Fixed Point Theorems in Orthogonal Fuzzy Metric Spaces Using Altering Distance Function, Advances and Applications in Mathematical Sciences, pp. 1175-1185. <http://surl.li/cdhoh>
11. Jahir hussain,2021, On Fuzzy Dominator Chromatic Number Of Middle, Subdivision And Total Fuzzy Soft Graphs, International Journal of Aquatic Science,pp.104-111 <http://surl.li/cdhqq>
12. R. Jahir Hussain, (2020). Neutrosophic Vague Line Graphs. *Neutrosophic Sets and Systems*, 36,121-130.
13. Nagoor Gani, Compactness and Fuzzy Pairwise a, b, g Compactness in Fuzzy Bitopology, Advances in Mathematics: Scientific Journal.<https://doi.org/10.37418/amsj.9.12.10>
14. Mohamed Ismayil, 2020, Complementary Nil G-Eccentric Domination in Fuzzy Graphs, Advances in Mathematics: Scientific Journal.<https://doi.org/10.37418/amsj.9.4.28>
15. Mohamed Ismayil, 2020, Eccentric Domination Polynomial of Graphs, Advances in Mathematics: Scientific Journal. Advances in Mathematics: Scientific Journal 9 (2020), no.4, 1729–1739 ISSN: 1857- 8365 (printed); 1857-8438 (electronic)<https://doi.org/10.37418/amsj.9.4.29>
16. N Mohamed Thoiyab, 2020, Global Stability Analysis of Neural Networks with Constant Time Delay via Fresenius Norm, Mathematical Problems in Engineering.<https://doi.org/10.1155/2020/4321312>.
17. N Mohamed Thoiyab, 2020, Novel results on global robust stability analysis for dynamical delayed neural networks under parameter uncertainties, IEEE Access, 8, 178108-178116, (2020). DOI: 10.1109/ACCESS.2020.301743. [JCR Impact Factor: 3.476]. <https://ieeexplore.ieee.org/abstract/document/9167210/>
18. A. Prasanna, 2020, Algebraic Structures on Product of $\psi - \bar{Q}$ -Fuzzy Subgroup and Normal Subgroup, Materials Today: Proceedings. <https://doi.org/10.1155/2016/4918948>
19. A. Prasanna,2020, Algebraic Properties on ω -Fuzzy Translation and Multiplication in BH-Algebras, AIP Conference Proceedings. <https://doi.org/10.1063/5.0017626>.

20. A. Prasanna, 2020, $\kappa - Q$ –Fuzzy Orders Relative to $\kappa - Q$ –Fuzzy Subgroups and Cyclic group Fundamental Various Aspect, Materials Today: Proceedings.

(v) Department of Physics

I. Patent Filed:

1. Mohamed Saleem has filed a patent for “An Efficient Method for the Synthesis of Nanospheric $ZnGa_2O_4$ Crystallites and Developing its assembled three dimensional structure”. Application Number: 202041037974A; Published Date: 04/03/2022.

II. Publications:

1. Dr. R. Raj Muhamed, 2021, Quantum chemical designing of 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxychromenium as an efficient sensitizer for dye sensitized solar cell, Journal of Optoelectronic and Biomedical Materials, 13 (3): 107 – 117. <https://chalcogen.ro/index.php/journals/journal-of-optoelectronic-and-biomedical-materials/13-jobm/548-volume-13-number-3-july-september-2021>
2. Dr. A. S. Haja Hameed, 2021, Biocidal activity of Ba^{2+} - doped CeO_2 NPs against Streptococcus mutans and Staphylococcus aureus bacterial strains, Royal Society of Chemistry, **RSC Adv.**;1: 30623-30634 <https://pubs.rsc.org/en/content/articlelanding/2021/ra/d1ra05948c>
3. Dr. S. Shek Dhavud, 2021, Effect of F doping on the properties of zinc tin oxide thin films for UV photodetector applications prepared by low-cost nebulizer spray pyrolysis method, Optical Materials, j.optmat.; 123:111862, optmat.2021.111862. <https://www.sciencedirect.com/science/article/abs/pii/S0925346721010624>
4. Dr. C. Hariharan, 2021, Performance of Single Slope Solar Still for Socio-Economic Development in Coast locations in India, International Journal of Ambient energy, Int. J. Ambient. Energy.; 1-9, <https://www.tandfonline.com/doi/abs/10.1080/01430750.2021.1927838>
5. Dr. S. Shek Dhavud, 2022, High responsivity n-ZnO/p-CuO heterojunction thinfilm synthesised by low-cost SILAR method for photodiode applications, Optical Materials, j.optmat.; 128:112410, <https://doi.org/10.1016/j.optmat.2022.112410>. <https://www.sciencedirect.com/science/article/abs/pii/S092534672200444X>
6. Dr. S. Shek Dhavud, 2022, Corrosion resistance effect of Dinonyl Sulphide (DNS) on Zinc Metal immersed in 0.5N Hydrochloric Acid, Bulletin of Environment, Pharmacology and Life Sciences, Bull. Env. Pharmacol. Life Sci.;1:403-414. [https://bepls.com/spl\(1\)2022.html](https://bepls.com/spl(1)2022.html)
7. Dr. J. Ebenezar, 2022, Effect of Mn doping on the structural, optical, magnetic properties, and antibacterial activity of ZnO nanospheres, Journal of Sol-Gel Science and Technology, J Solgel Sci Technol.; 2: 0928-0707, <https://www.springerprofessional.de/en/effect-of-mn-doping-on-the-structural-optical-magnetic-propertie/20291740>
8. A. Mohamed Saleem, 2020, Preparation and characterization studies of TiO_2 doped ZrO_2 onITO nanocomposites for optoelectronic applications, Materials Today: Proceedings. <https://doi.org/10.1016/j.matpr.2020.04.748>
9. A. Ishaq Ahamed, 2020, State feedback control and observer-based adaptive synchronisation of chaos in a memristive Murali–Lakshmanan–Chua circuit, A Springer Link Journal published by the Indian Academy of Sciences in association with the Indian National Science Academy and Indian Physics Association. Pramana – J. Phys. (2020) 94:152 © Indian Academy of Sciences <https://doi.org/10.1007/s12043-020-02017-5>.
10. A. Ishaq Ahamed, 2020, Sliding Bifurcations in the Memristive Murali–Lakshmanan–Chua Circuit and the Memristive Driven Chua Oscillator, International Journal of Bifurcation and Chaos. <https://doi.org/10.1142/S0218127420502144>.

11. R. Raj Muhamed, 2020, Synthesis, Spectroscopic elucidation (FT-IR, FT-Raman, UV-Vis), electronic properties and biological activities (antimicrobial, docking) of semicarbazide derivative, Synthesis, Spectroscopic elucidation (FT-IR, FT-Raman, UV-Vis), electronic properties and biological activities (antimicrobial, docking) of semicarbazidederivative. <https://doi.org/10.1016/j.matpr.2020.09.569>.
12. A. S. Haja Hameed, 2020, Biomolecule chitosan, curcumin and ZnO-based antibacterial nanomaterial, via a one-pot process, Carbohydrate Polymers. <https://doi.org/10.1016/j.carbpol.2020.116825>.
13. C. Hariharan, 2020, Influence of Nickel oxide nanoparticles on the absorption enhancement of solar radiation for effective distillation by single slope wick-type solar still, Materials Today: Proceedings. December 2020 Materials Today: Proceedings [,DOI:10.1016/j.matpr.2020.10.704](https://doi.org/10.1016/j.matpr.2020.10.704)

(vi) Department of Zoology

I. Patents Filed:

1. S.N. Sheik Umar Sahith has filed a patent on “Square Scale, Rectangle Scale and Straight Rulers”. Application No. 202241001278; Publication Date: 28-01-2022.
2. Dr. Meeramaideen has filed a patent on “Production of Bio compound from fowl egg shell”. Application No. 202241020134; Publication Date: 04-04-2022.

II. Publications:

1. Rajasekar. P Meeramaideen. M Salahudeen. M, 2021, Effect of Insect Growth Regulating Compounds ‘Methoprene’ On Oviposited And Short Time Exposure Against A Selected Three Vector Mosquitoes, Annals of the Romanian Society for Cell Biology , vol: 42; pp: 126-136. <https://www.mbimph.com/index.php/UPJOZ/article/view/2479>
2. Rajasekar. P Meeramaideen. M Salahudeen. M, 2021, Efficacy of Igrs Compound Triflumuron and Methoprene Against Culex Quinquefasciatus Mosquito Larvae and Pupal Control In Pools, Drains And Tanks, Uttar Pradesh Journal of Zoology, Vol:42, PP: 8-14. <https://mbimph.com/index.php/UPJOZ/article/view/2171>
3. R. Krishnamoorth, 2021, Assessment of ambient gamma dose rate in different locations of calicut district, kerala, Uttar Pradesh Journal of Zoology, Vol:42, PP:49-53. <https://mbimph.com/index.php/UPJOZ/article/view/2223>
4. Rajasekar. P Meeramaideen. M Salahudeen. M, 202, Effect of Insect Growth Regulating Compounds ‘Methoprene’ On Oviposited and Short Time Exposure Against A Selected Three Vector Mosquitoes, Uttar Pradesh Journal of Zoology, vol: 42; pp: 126-136. <https://www.mbimph.com/index.php/UPJOZ/article/view/2479>
5. H.E. Syed Mohamed,2021, Macrohymenopteran diversity in Thommana Kole weland, Thrissur, India, vol: 46 doi: <https://doi.org/10.33307/entomon.v46i3.616>
6. Sadiq Bukhari, 202, The diversity of butterflies in southern part of the western ghats (Palani Hills), Uttar Pradesh Journal of Zoology, Vol: 42(issue-22); pp: 37-46. <https://www.mbimph.com/index.php/UPJOZ/article/view/2555>
7. R. Krishnamoorthy I. Joseph Antony Jerald, 2021, Evaluation of hydrobiological properties of temple ponds in Tiruchirappalli, Tamilnadu, India, International Journal of Natural Sciences (2021), 11(2): 11-19 <http://www.ijns.net/article/view/IJNS202202132010663374445147>
8. A.Sadiq Bukhari, 2022, Evenness dominance and diversity of butterflies in Palani hills of western Ghats, International Journal of Entomology Research,
9. S. Mohamed Hussain, 2021, Exploration of acute toxicity, analgesic, anti-inflammatory, and anti-pyretic activities of the black tunicate, Phallusianigra (Savigny, 1816) using

- mice model, Environmental Science and Pollution Research. <https://doi.org/10.1007/s11356-020-10938-2>
10. S. Mohamed Hussain, 2021, Assessment of Potential human health risk due to heavy metal contamination in edible finfish and shellfish collected around Ennore coast, India, Environmental Science and Pollution Research. <https://doi.org/10.1007/s11356-020-10764-6>.
 11. Sadiq Bukhari, 2020, Hepatic toxicological responses of SiO₂ nano particle on *Oreochromis mossambicus*, Environmental Toxicology and Pharmacology . <http://dx.doi.org/10.1016/j.etap.2020.103398>.
 12. A. Sadiq Bukhari, 2020, Activity concentration of polonium-210 and lead-210 in tobacco products and annual committed effective dose to tobacco users in Tiruchirappalli District (Tamil Nadu, India), Journal of Radio analytical and Nuclear Chemistry, <http://dx.doi.org/10.1007/s10967-019-06879-x>.
 13. R. Krishnamoorthy, 2021, A Study On The Naturally Occurring Radionuclides In The Soil Samples Of Kozhikode District, Kerala , Journal of Natural Remedies Vol. 21, No. 9(2):6-10.
 14. R. Krishnamoorthy 2021, Analysis of gross alpha radioactivity in sediment of Pulicat lagoon, south East coast of India, Uttar Pradesh Journal of Zoology 42(6): 90-97 . <https://mbimph.com/index.php/UPJOZ/article/view/2025>
 15. R. Krishnamoorthy, 2021, Environmental radio activity in the Malappuram district, Kerala, india - using bio indicator species, Uttar Pradesh Journal of Zoology 42(4): 1-5. <https://mbimph.com/index.php/UPJOZ/article/view/1956>
 16. R. Krishnamoorthy 2021, Primordial Radionuclides Activity and External Radiation Hazard Index Evaluation in Pulicat Lake Sediments, South East Coast of India, Uttar Pradesh Journal of Zoology, 42(4): 37- 43. <https://mbimph.com/index.php/UPJOZ/article/view/1967>
 17. A. Sadiq Bukhari., Diversity, Dominance and Evenness of Butterflies in Southern Part of Western Ghats (Palani Hills) Indian Journal of Natural Sciences , IJONS - ISSUE 65 APRIL 2021/ISSN – 0976-0997. Page – 29589- 29597(2021). <http://s-o-i.org/1.15/ijarbs-2016-3-5-23>
 18. A. Sadiq Bukhari., The Role Of Butterflies Towards Creating Ecological Balance And Biodiversity Conservation In Southern Part Of Western Ghats (Palani Hills), Uttar Pradesh Journal Of Zoology, 41(23): 95-112, 2020 ISSN: 0256-971X (P), 2020. <https://mbimph.com/index.php/UPJOZ/article/view/1796>

PART – C
Audited Documents and Receipts
Enclosure 1

FIST PROGRAM
STATEMENT OF EXPENDITURE
(For the period from 01st April 2021 to 31st March 2022)

1. Sanction Order No. & Date : SR/FST/College-2018-315(C), Dt.22 July 2019 & 28 June 2021
2. Total Sanctioned Project Cost (in Rs) : 1,10,00,000/-
3. Date of Commencement of the Project : 31-07-2019
4. Grant Received in each year (in Rs) :

Head	1 st Year (31 st July 2019 to 31 st March 2020)	2 nd Year (01 st April 2020 to 31 st March 2021)	3 rd Year (01 st April 2021 to 31 st March 2022)	4 th Year	5 th Year	Interest, If any		Total
						2019-20 & 2020-21	2021-22	
Sanctioned	60,50,000.00	--	45,25,000.00			175746.00	74248.00	1,08,24,994.00
Total	60,50,000.00	--	45,25,000.00			249994.00		1,08,24,994.00

5. Statement of Expenditure

Sanctioned Budget Heads	Allocation of Funds (in Rs)	Total Grant Received	Expenditure					Balance as on March 2022 (in Rs)	Remark if any	
			1 st Year (31 st July 2019 to 31 st March 2020)	2 nd Year (01 st April 2020 to 31 st March 2021)	3 rd Year (01 st April 2021 to 31 st March 2022)	4 th Year	5 th Year			Total
Equipment (E)	92,00,000.00	(Fin. Year 2019-20) 60,00,000.00	46,099.60	70,50,547.26	--			70,96,646.86	--	Rs.10,96,646.86 contributed by the management for purchase of Equipment
		(Fin. Year 2021-22) 32,00,000.00	--	--	12,07,220.08			12,07,220.08	19,92,779.92	A sum of Rs.19,92,838/- paid through letter of credit in May & June -2022 for HPLC Equipment purchased from Singapore
Net Working & Computational Facilities (NW)	7,00,000.00	(Fin. Year 2021-22) 7,00,000.00	--	--	7,13,950.00			7,13,950.00	Excess amount spent 13,950.00	Adjusted with Books & E-Learning room
Books 3L + E learning Class Room 5L= 8L	8,00,000.00	(Fin. Year 2019-20) 50,000.00	17,793.00	32,401.00	--			50,194.00	--	Rs.194/- contributed by the management for purchase of Equipment -
		(Fin. Year 2021-22) 5,50,000.00	--	--	5,36,123.00			5,36,123.00	13,877.00	Adjusted with Networking
Maintenance (M)	3,00,000.00	(Fin. Year 2021-22) 75,000.00	--	--	74,500.00			74,500.00	500.00	
Total	1,10,00,000.00	1,05,75,000.00	63,892.60	70,82,948.26	25,31,793.08			96,78,633.94	*19,93,206.92	

* Total Grant Rs.1,05,75,000.00 (+) Management Contribution 10,96,840.86 (-) Total Exp. Rs.96,78,633.94 = Rs.19,93,206.92.

R. J.
Name & Signature of Project Coordinator
Date: 14.06.2022

[Signature]
Name & Signature of Competent Financial Authority Dr. S.J. George
Date: 14.06.2022 @malarekhanam

A. ABDUL SALAM
Name & Signature of Chartered Accountant
Date: 14.06.2022

Dr. R. JAHIR HUSSAIN
Associate Professor & Head
Department of Mathematics
Jamal Mohamed College (Autonomous)
Tiruchirappalli-620 080

BURSAR
JAMAL MOHAMED COLLEGE
TIRUCHIRAPPALLI-20.



Note: Expenditure under the sanctioned Heads, at any point of time should not exceed funds allocated under the Head without prior approval of the Head.
2. Utilization Certificate for each financial year ending 31st March has to be enclosed along with request to carry forward permission to next year.

UDIN: 22201447AKXEJR6554

Enclosure 2

FORM GFR 12A

GENERAL FINANCIAL RULES 2017

**Ministry of Finance
Department of Expenditure**



GFR 12 – A

[(See Rule 238 (1))]

FORM OF UTILIZATION CERTIFICATE FOR AUTONOMOUS BODIES OF THE GRANTEE ORGANIZATION

UTILIZATION CERTIFICATE FOR THE YEAR 2021-2022 (01.04.2021 to 31.03.2022) in respect
of recurring/non-recurring
GRANTS-IN-AID/SALARIES/CREATION OF CAPITAL ASSETS

1. Name of the Scheme : DST – FIST Program
2. Whether recurring or non-recurring grants : Recurring & Non-recurring
1. Grants position at the beginning of the Financial year
- (i) Cash in Hand/Bank : --
- (ii) Unadjusted advances : --
- (iii) Total : --
2. Details of grants received, expenditure incurred and closing balances: (Actuals)

Unspent Balances of Grants received years [figure as at Sl. No. 3 (iii)]	Interest Earned thereon	Interest deposited back to the Government	Grant received during the year			Total Available funds (1+2-3+4)	Expenditure incurred	Closing Balances (5-6)
			Sanction No. (i)	Date (ii)	Amount (iii)			
1	2	3	4			5	6	7
			Sanction No. (i)	Date (ii)	Amount (iii)			
--	74,248.00	74,248.00	SR/FST/College -2018/315(C) and (G)	28 th June, 2021	45,25,000.00	45,25,000.00	25,31,793.08	19,93,206.92

Component wise utilization of grants:

Grant-in-aid-General	Grant-in-aid-Salary	Grant-in-aid-creation of capital assets	Total
74,500.00	--	24,57,293.08	25,31,793.08

Note: A sum of Rs.19,92,838/- paid through letter of credit in May & June -2022 for HPLC Equipment purchased from Singapore.

Details of grants position at the end of the year

- (i) Cash in Hand/Bank : 19,93,206.92
- (ii) Unadjusted Advances : --
- (iii) Total : 19,93,206.92



GENERAL FINANCIAL RULES 2017
Ministry of Finance
Department of Expenditure

Certified that I have satisfied myself that the conditions on which grants were sanctioned have been duly fulfilled/are being fulfilled and that I have exercised following checks to see that the money has been actually utilized for the purpose for which it was sanctioned:

- (i) The main accounts and other subsidiary accounts and registers (including assets registers) are maintained as prescribed in the relevant Act/Rules/Standing instructions (mention the Act/Rules) and have been duly audited by designated auditors. The figures depicted above tally with the audited figures mentioned in financial statements/accounts.
- (ii) There exist internal controls for safeguarding public funds/assets, watching outcomes and achievements of physical targets against the financial inputs, ensuring quality in asset creation etc. & the periodic evaluation of internal controls is exercised to ensure their effectiveness.
- (iii) To the best of our knowledge and belief, no transactions have been entered that are in violation of relevant Act/Rules/standing instructions and scheme guidelines.
- (iv) The responsibilities among the key functionaries for execution of the scheme have been assigned in clear terms and are not general in nature.
- (v) The benefits were extended to the intended beneficiaries and only such areas/districts were covered where the scheme was intended to operate.
- (vi) The expenditure on various components of the scheme was in the proportions authorized as per the scheme guidelines and terms and conditions of the grants-in-aid.
- (vii) It has been ensured that the physical and financial performance under..... (name of the scheme has been according to the requirements, as prescribed in the guidelines issued by Govt. of India and the performance/targets achieved statement for the year to which the utilization of the fund resulted in outcomes given at Annexure – I duly enclosed.
- (viii) The utilization of the fund resulted in outcomes given at Annexure – II duly enclosed (to be formulated by the Ministry/Department concerned as per their requirements/specifications.)
- (ix) Details of various schemes executed by the agency through grants-in-aid received from the same Ministry or from other Ministries is enclosed at Annexure –II (to be formulated by the Ministry/Department concerned as per their requirements/specifications).

Date:

Place:

Signature

Name Dr. D.S. George Amalakkannan

Chief Finance Officer Date: 14.06.2022

(Head of the Finance)

BURSAR
JAMAL MOHAMED COLLEGE
(AUTONOMOUS)
TIRUCHIRAPPALLI-20.

Signature

Name Dr. S. Ismail Mohideen

Head of the Organization Date: 14.06.2022

PRINCIPAL
JAMAL MOHAMED COLLEGE
(AUTONOMOUS)
TIRUCHIRAPPALLI-620 020.

Signature

Name

A. ABDUL SALAM

Chartered Accountant

Date: 14.06.2022



UDIN : 22201447AKXEJR6554

Enclosure 3



bharatkosh.gov.in
Government of India Receipt Portal

RECEIPT

TransactionRef.No. 2103220004058 Dated:Mar21202211:40AM

ReceivedfromM/S.ISMAILMOHIDEENS withTransactionRef.No.2103220004058

DatedMar 21 2022 11:40AMthe sum ofINR 74248 (Seventy-Four ThousandTwo Hundred Forty-Eight Only)through Internet based Online payment in theaccountof
interest receipton unspent balances, , JAMAL MOHAMED COLLEGE-REFUND OFINTERESTONGRANT-2021-2022.

Disclaimer:-This is a system generated electronic receipt, hence no physical signature is required for the purpose of authentication

PrintedOn:21-03-202211:42:47

Courtesy :- Controller General of Accounts



FIST PROGRAM (Level-0) PROGRESS REPORT (2021 - 2022)

(Participating Departments - Botany, Chemistry, Computer Science, Mathematics, Physics & Zoology)



JAMAL MOHAMED COLLEGE

(Autonomous)

Tiruchirappalli 620 020, Tamil Nadu

+91 431 2331135 | princi@jmc.edu | www.jmc.edu