

**Completion Report**  
**(Date of Sanction to Date of**  
**Completion)**

**Department of Biotechnology**

**Proforma for submission of Completion Report supported under Star College Scheme**

**(Kindly note that the Completion report from Point 6 to 10, should not be more than 25 A4 size sheets, with fontsize 12pt and line spacing 1.5) Relevant annexure may be attached at appropriate places.**

- 1. Name of the College:** Mugberia Gangadhar Mahavidyalaya
- 2. Name of Coordinator, designation,** Dr Bidhan Chandra Samanta, Associate  
**Address, Phone nos.** Professor, Department of Chemistry, Mugberia  
Gangadhar Mahavidyalaya, Bhupatinagar, Purba Medinipur,  
West Bengal, India, 721425  
Phone: 9732752907
- 3. Assessment duration:** 24/08/2020 to 23/08/2023  
Duration in years: 3 years

**4. Details of Departments Supported**

Sl. No	Name of Department	Courses (B.Sc./M.Sc./PG Diploma, certificate etc.) offered	Regular Faculty members	
			Total =	
			With Ph.D.	Without Ph.D.
1	Chemistry	B. Sc.	2	4
2	Mathematics	B. Sc. & M. Sc.	2	7
3	Zoology	B. Sc.	2	4

- 5. Number & Date of Advisory committee meeting held:** - 01 (online) dated 29.06.2022
- 6. Qualitative improvements due to DBT support. Please highlight 5 salient points (within 1000 words).**  
(You may enumerate 5 minor projects where students were involved and their impact or similar activities and their outcome; this is for representative purpose and coordinator may include details as per his own choice; kindly refrain from providing philosophical data Avoid any introduction. All the justifications must be very crisp like any aspect non-existent pre-STAR Scheme and you achieved after the grant). This information may be given department wise:-

With the financial support from DBT under Star College Strengthening scheme we are able to provide more lab facilities to the students in conducting project work and in more hands on exposure that could not be performed in pre-STAR scheme. Five such salient activities which have been achieved during the three years of receiving the grant are mentioned below department wise:

## Department of Chemistry

### a. Estimation of nitrogen, phosphorous and potassium (NPK) in the fertilizer free soil

This was an inter-departmental activity. About 30 students and 10 teachers from three participating departments participated in this activity. For soil fertility point of view, estimation of NPK in the soil is very vital. Normally the samples are taken from the plough layer i.e., 0-15 cm depth. This is applicable for the fields growing cereals and other crop. In case of deep-rooted crops and under dry farming conditions, it may be necessary to obtain samples from different depths (or layers) of soil. In our work, soil has been collected from the plough layer for estimation of nitrogen and potassium. Phosphorous estimation is yet to be done. For nitrogen estimation a known weight (5 gm.) of the soil is mixed with excess of alkaline  $\text{KMnO}_4$  and distilled. Ammonia gas released by distillation is absorbed in a known volume of standard sulphuric acid excess of which is titrated with standard alkali using methyl red as an indicator. From the result analyses it is observed that the amount of nitrogen in the examined soil is 439.88 kg/hector which indicates medium fertility of the soil. With the help of flame photometer, potassium was also estimated of the same amount of soil. The result is also in a good agreement with the literature. In the pre-Star scheme we have no scope to do this experiment as we have no microprocessor based flame photometer with auto ignition or sufficient set of instruments required for this experiment. But after achieving the grant we have procured those instruments and students are able to carry out the project successfully.

### b. Determination of arsenic(III) in ground water by spectrophotometric technique

This minor project work was carried out by 3 students from SEM VI under the guidance of two faculty members of the department. In this study, a newly designed Schiff base has been successfully utilized as an analytical probe for micro level spectrophotometric determination of As (III) at pH 3.7. The Schiff base was synthesized from the reaction of 6-methoxy pyrrole-2-carboxaldehyde and thiosemicarbazide in DMF by stirring for about 3 hrs. Here, it is observed that the As-complex showed maximum absorbance at  $\lambda_{\text{max}}$  368 nm for As (III) ions. The standard straight line curve was use for determination of molar extinction coefficients where absorption vs. concentration of arsenic is plotted. Using the data, concentration of arsenic in the tested water has been determined. This proposed method has been successfully applied to the determination of arsenic in the drinking water samples of Bhupatinagar, in the district of Purba Medinipur, West Bengal, India. The results show that the concentration of arsenic in the ground water of said region is 0.34  $\mu\text{g/L}$  which is below danger level and supports to the recognition of free arsenic zone for the concerned area.

### c. Estimation of fluoride in ground water by spectrophotometric technique

This minor project work was carried out by 2 students from SEM VI under the guidance of two faculty members of the department. The current study intends to highlight the technique of fluoride estimation by spectrophotometric method. Flavonoid chrysin, xylenol orange, alizarin red-s are widely used as ligands for complexation with metal ions like  $\text{Al}^{3+}$  to estimate amount of fluoride in a mixture of elements. But to avoid these extensive toxic chemicals, a comparatively less toxic and economical friendly agent Eriochrome Black T (EBT), the well-known azo dye, is used in the present study for complexometric titration. Herein, we have allowed EBT dye to get complexation with  $\text{Al}^{3+}$ . This Al-EBT complex acts here as metallo-ligand and catches the fluoride resulting in pink color. By using UV-Vis spectrophotometric method, then the amount of fluoride has been determined present in ground water. This proposed method has been successfully applied to the determination of fluoride in the drinking water samples of Bhupatinagar, in the district of Purba Medinipur, West Bengal, India. The results show that the concentration of fluoride in the ground water of said region is 0.295 mg/L which is much below in comparison to WHO's maximum contamination limit. This implies that the ground water of the concerned area is free from fluoride contamination.

**d. Carbohydrate and protein estimation in jam, bread, cookies, dahi, cake, lassie etc. by spectrophotometrically**

These project works were guided by the faculty members of Chemistry department. About 25 PG students (15 male and 10 female) from Chemistry and Food processing department carried out these project works by spectrophotometrically for various functional food products prepared by them. At first students were demonstrated about these experiments. Then they were engaged in the project and carried out it fruitfully. Anthorne method was used for carbohydrate and Fehling reagent was used for protein estimation. For solution preparation of the sample, sonicator was used. Carbohydrate percentages obtained in jam and bread are about 56 % (w/w) and 63% (w/w) respectively and that of protein contents in dahi and cake are 37% and 34% respectively which are in good agreement with the expected values. In the pre-Star scheme we have no scope to do this experiment as we have no sonicator machine or sufficient funding to purchase required chemicals for this test. But after achieving the grant we are able to carry out these projects successfully.

**e. Quantitative test for saponin content in quinoa flour**

This project was carried out by one male student from Chemistry and one female student from the department of Food processing under the supervision of Chemistry department. From the result analyses it is observed that the amount of saponin content in the examined quinoa flour is 1.86 % which is in a good agreement with the literature. With the help of water bath with thermostat and separating funnel, this experiment was carried out. In the pre-Star scheme we have no scope to do this experiment as we have no water bath with thermostat or sufficient set of instruments and chemicals required for this experiment. But after achieving the grant we have procured those instruments and students are able to carry out the project successfully.

**f. DNA/protein interaction study with Schiff Base Transition metal complexes**

The students of SEM V from Chemistry Honours have performed this project work. They first synthesized two Schiff base transition metal complexes and studied their nature of interaction with CT-DNA and BSA protein which is very much helpful to study their anti-cancer activities. In the pre-Star scheme we have no scope to do this experiment as we have no funding for purchasing high costly chemicals, CT-DNA, BSA protein required for this experiment. But after achieving the grant it becomes very easier to engage students in this type of project work successfully.

**g. Critical Micelle Concentration (CMC) determination of a surfactant (Sodium Dodecyl Sulphate) by using Tensiometer**

The students of SEM VI from Chemistry Honours have performed this project work. They determined the CMC value of sodium dodecyl sulphate by using tensiometer by a known method. This obtained CMC value can be used to identify changes during interaction with CT-DNA and BSA protein which is very much helpful to know the binding affinity of a surfactant with biomolecules and probable applications of this in biological systems. In the pre-Star scheme we have no scope to do this experiment as we have no funding for purchasing tensiometer and high costly chemicals, CT-DNA, BSA protein required for this experiment. But after achieving the grant it becomes very easier to engage students in this type of project work successfully.

## **Department of Mathematics**

**a. Solving EOQ Model with Deterioration using Fuzzy Set Theory**

In this project, the students of Mathematics department studied a fuzzy inventory model for deteriorating items with time dependent demand rate and partial back logging. For deterioration and back logging rate the parameters  $\alpha$ ,  $\Theta$ ,  $\sigma$  are considered as triangular fuzzy numbers. For defuzzification by signed distance method and centroid method it has been observed that the total profit decrease as the optimal cycle time decreases and the profit given by the signed distance method is minimum as compared to the centroid method. Further this model can be generalized by

considering time dependent deterioration rate, holding cost, shortage cost and so many types.

**b. Solving EPQ Model for Deteriorating Items using Genetic Algorithms**

In this project, economic production quantity (EPQ) model has been developed considering varying both the unit production cost and set-up cost by the students of Mathematics department. We have considered the unit production cost as a continuous decreasing function of production rate and set-up cost as a continuous increasing function of production rate. The problem is described with a mathematical model, and then a simple procedure is proposed to solve it. From the numerical results, we could clearly see that loss due to using the classical EPQ model is significant. The results of this study can help managers make optimal decisions on equipment selection (with optimal cycle period). Also, the optimal production quantity based on the optimal value of production rate can be determined.

**c. Modelling the Effect of Immune Protection and Vaccination Against COVID 19**

These project works were guided by the faculty members of Mathematics department. About 3 PG students (3 male) from Mathematics department carried out these project works by optimization of effect of immunity power and vaccination against COVID 19. The results are evaluated and figures are drawn by using MATLAB software. The project paper is written by LATEX software.

Also 9 projects works are completed by the remaining 27 PG students (Male -13 & Female -14) of the said department.

**d. A stochastic Multi-Channel Revenue management Model with time dependent demand**

These project works were guided by the faculty members of Dept. of Mathematics. About 3 PG students (2 male, 1 female) from Dept. of Mathematics carried out these project work by multi-channel revenue management model. Besides the firm's revenue management decision of dynamically allocating its limited inventory to different demand classes, it may also get a different margin for selling the same product through different channels (at the same price). By developing a stochastic (Hamiltonian) channel control system and using the Maximum Principle, the optimal channel control rules are found and a threshold channel control policy is proposed. Based on the channel control policy, we show that there exist the unique optimal protection levels for all periods. The results are evaluated and figures are drawn by using MATLAB software. The project paper is written by LATEX software.

**e. A Fuzzy production inventory control model using Granular Differentiability approach**

In this project, we have created a single-period fuzzy production inventory control model on the finite time horizon. A new nonlinear demand function has been introduced, which depends on the stock, selling price and product quality. The realistic reasons come from logistical function and entry into the initial demand for the product and the reliance on uncertain advertising rates, uncertain stock rates, uncertain selling prices and uncertain product quality. In order to control and test the stability, the model needs to be defuzzified.

**f. Numerical approach of multi-objective optimal control problems in imprecise environment**

These project works were guided by the faculty members of Dept. of Mathematics. About 3 PG students (3 male) from Dept. of Mathematics carried out these project. In this project, realistic production-inventory models without shortages for deteriorating items with imprecise holding and production costs for optimal production have been formulated. Here, the rate of production is assumed to be a function of time and considered as a control variable. Also the demand is time dependent and known. The imprecise holding and production costs are assumed to be represented by fuzzy numbers which are transformed to corresponding interval numbers.

**g. Teleportation of five qubit state using six qubit state**

In this project, they present a protocol for perfectly teleporting a five – qubit state of specific type and utilize a sixqubit entangled quantum channel for this purpose. In this protocol only four out of  $2^6$  possible measurement outcomes appear. This leads to a substantial convenience in the implementation of the protocol. The project paper is written by LATEX software.

**h. Multi-objective 4 dimensional Transportation Problem**

These project works were guided by the faculty members of Dept. of Mathematics. About 3 PG students (3 male) from Dept. of Mathematics carried out this project. In this project, there are several connecting roads between different cities (sources/destinations), infrastructural developments. Considering all these facts, to find a trade-off between the above objectives, multi-objective incompatible and breakable/damageable multi-items 4-dimensional transportation models for minimum cost, time and carbon emission are developed and solved by different methods. The results are evaluated and figures are drawn by using MATLAB software.

**i. Mathematical Modelling and control of COVID –influenza co-infection**

In this project, due to the clinical similarity of Covid-19 with other flulike syndromes, patients are assayed for other pathogens of influenza like illness. There have been reported cases of co-infection amongst patients with Covid-19. Bacteria for example Streptococcus pneumonia, Staphylococcus aureus, Klebsiella pneumonia, Mycoplasma pneumonia, Chlamydia pneumonia, Legionella pneumophila etc. and viruses such as influenza, coronavirus, rhinovirus/enterovirus, parainfluenza, metapneumo virus, influenza B virus etc are identified as co-pathogens. In our current effort, we develop and analyzed a compartmental based Ordinary Differential Equation (ODE) type mathematical model to understand the co-infection dynamics of Covid-19 and other influenza type illness. In this work we have incorporated the saturated treatment rate to take account of the impact of limited treatment resources to control the possible Covid-19 cases. As results, we formulate the basic reproduction number of the model system. The results are evaluated and figures are drawn by using MATLAB software. The project paper is written by LATEX software.

**j. Visceral Leishmaniasis and control strategies**

These project works were guided by the faculty members of Dept. of Mathematics. About 3 PG students (1 male, 2 female) from Dept. of Mathematics carried out these project. VL elimination initiative has saved many human lives; however, for VL elimination to become a reality in a sustained way, an intense effort is needed, as substantial numbers of endemic sub-districts (PHC blocks level) are yet to reach the elimination target. In addition to effective epidemiological surveillance, appropriate diagnostic and treatment services for VL at primary health centers will be needed to ensure long term sustainability and prevent re-emergence of VL.

**k. Multi-item 4 dimensional transportation problem**

In this project, due to infrastructural developments, there are several connecting roads between different cities (sources/destinations). Considering all these facts, to find a trade-off between the above objectives, multi-objective incompatible and breakable/damageable multi-items 4-dimensional transportation models for minimum cost, time and carbon emission are developed and solved by different methods. The project paper is written by LATEX software. The results are evaluated and figures are drawn by using MATLAB software.

**l. Numerical methods to solve 2D Laplace differential equation**

In this project, use numerical techniques to find the approximate solution of the two-dimensional Laplace equation with Dirichlet boundary conditions. We have applied two methods in particular to obtain the numerical solution to this equation. The first is the finite difference method using two different factors (five and nine points) for the Laplace Equation. The second method is finite elements in regular shape. We compared the numerical solutions obtained by these two methods. We found that the finite difference method using different factor (nine-point) method is the most accurate method after we compare these results with the exact solution. The project paper is written by LATEX software.

## Department of Zoology

### a. Eurothelial Micronuclei study of the students

23 students (9 male students and 14 female students) from Zoology department were engaged to perform this activity. Quantitative analysis of micronucleus (MN) in the urothelial cells was measured following the method previously described by Ghosh et al., (2006). Urine samples were collected in the sterilized container (Sterile Uricol, Himedia) from the participating students. Urinary epithelial cells were collected by centrifugation (1,000 rpm for 10 min). Cell pellets were washed with 0.9% NaCl (Merck, India) and cell density was observed with a phase-contrast microscope. Urine samples from students both male and female were analyzed, which showed considerable amount of micronuclei which indicates cytogenetic damage. In the pre-Star scheme we have no scope to do this experiment as we have no centrifuge machine or phase contrast microscope. But after achieving the grant we have procured those instruments and able to carry out the project successfully. At first students were very shy to give the urine samples but after an informative discussion they were very much engaged in the project spontaneously and carried out the project fruitfully.

### b. BOD determination of pond water used for domestic purpose in the surrounding locality

This was an outreach activity done by the students of inter departments (Zoology, Chemistry and Mathematics). First the students collected the water from ponds of their nearby surroundings and then they carried out the first phase of the experiment in the laboratory of Zoology by using BOD incubator. After five days incubation they obtained the results of five ponds bearing BOD values were 1.205 mg/l, 1.54, 0.57 mg/l, 2.4 mg/l, 0.286 mg/l and it indicates that the pond water is very good for use of domestic purpose. In the pre-Star scheme, there were no BOD incubators for doing this outreach activity in a mass scale. But after receiving the grant, this can be done successfully.

### c. Awareness Camp on Obesity and Women Reproductive Health

A two day awareness camp on the risk of obesity and associated women reproductive health was conducted by the Department of Zoology, Mugberia Gangadhar Mahavidyalaya in association with the Environmental Epigenomics Laboratory, University of Calcutta on 12th and 13th July, 2022. Eminent doctors and research scholars from the University of Calcutta demonstrated the adverse effects of improper lifestyle on obesity and female reproductive health. Around 100 volunteers from Mugberia Gangadhar Mahavidyalaya of the age group 18 to 60 years participated in the health checkup camp which involved body composition analysis determining the fat and muscle ratio and blood pressure monitoring. Biological samples were collected from volunteers with their proper written consent and institutional ethical permission (Ref No. 003/17-18/1676). DNA isolation from individual blood samples was demonstrated by the team of researchers to the faculties and students of the Department of Zoology, Mugberia Gangadhar Mahavidyalaya. It has been observed that 30% of the participants including 19 male and 11 females were overweight with Body Mass Index (BMI)  $\geq 25$ . 50% of the participants were found to have normal BMI = 18.5 to 24.9, whereas 20% were underweight (BMI  $< 18.5$ ).

### d. Biomass smoke exposure Increase Alveolar Macrophage in relation to respiratory Symptoms and Pulmonary Functions among the rural women in West Bengal: A Preliminary Study

This is a population based cross sectional study with age- and sex-matched comparison groups. Information on demographics (age, education, habits, and occupation of the participants, average family income, cooking hours per day, cooking-years, kitchen and fuel type, family), occupation of the spouse and environmental tobacco smoke (ETS) was collected through personal interview using structured questionnaire. The initiative was taken by the Department of Zoology, Mugberia Gangadhar Mahavidyalaya in association with the Environmental Epigenomics Laboratory. The participants were instructed to rinse their mouth with saline water and to cough vigorously to expectorate sputum. The sputum was directly collected in the given container. Four smears were made on clean glass slides from the non-transparent high viscosity part of each sample. Two samples were for cytological analysis (qualitative and quantitative evaluation) using Papanicolaou's (Pap) procedure. Each specimen was

labeled, fixed (30 minutes in ethyl alcohol for Papanicolaou staining. Biological samples were collected from volunteers with their proper written consent and institutional ethical permission (Ref No. 003/17-18/1676).

The smears stained according to Papanicolaou's procedure (Hughes and Dodds, 1968) were evaluated using a light microscope (Dialux 20, Leitz, Germany). At least 20 high power fields at 400 x magnification were observed and the total and differential sputum cell count was scored (Grubb, 1994). Mean of the two slides was scored for each subject. Sputum samples were analyzed for 30 students and the number of AM in the sputum was expressed as the mean number of cells present in 15 high power fields (hpfs) of stained slides. Analysis of sputum samples revealed 64.76 AM/ 15 hpfs among the college students. Different nuclear anomalies (cells with binuclei and micronuclei) were observed in the majority of AM. It indicates increase of AM responsible for hypersensitivity for inflammation and allergic reaction.

**7. Any Novel aspect introduced during the Scheme duration.**

Yes it is planning to introduce some novel aspects during the scheme duration and some of them were introduced. Such for example, while studying micronucleus (MN) from students, it was thought to carry out this project on a broad level where we will study the MN of local farmers who are occupationally exposed to pesticides and the extent of cytogenetic damage will be studied taking prior permission of Ethical committee formed under this scheme. Besides, it is thought to introduce the study of DNA genetic variation of students and local farmers exposed to various pesticides for long period. Not only that but also obesity measurement of both teachers and students is planned and introduced during the scheme duration. The study of dye degradation or elimination by metal complexes as various waste dyes discharged into rivers and ponds by industries and thereby polluting the water and causing severe skin, liver, kidney and central nervous system diseases had been introduced. Not only that but also sensing of  $H_2O_2$  by metal complexes is thought to be introduced. Since  $H_2O_2$  on decomposition produces toxic superoxide anion and hydroxyl radical which are very much responsible for causing cancer and neurodegenerative disorders so it is very much important to detect  $H_2O_2$  widely used in food, cosmetic, pharmaceutical and paper industries. Identification the change in CMC value of surfactant during interaction with DNA/protein/carbohydrate was also planned to introduce. Introduction of Quantum Genetic Algorithm to solve different kind of NP-HARD problems was planned and introduced. Moreover, development of different kind Application Software by using C-Language were introduced.

**8. Lessons learnt / difficulties faced/suggestions if any, in implementation of the programme and utilization of DBT grant. (Max 3 points within 300 words).**

- a. Due to the lock down situation in the colleges and universities for COVID 19 pandemic, we have faced difficulties in many ways during the first and second years of grant received. Though we are able to purchase the equipment, yet we could not use laboratories at a full phase and students cannot be engaged in the experimental works in a regular way. So we could not able to carry out all the targeted experiments but tried to do most of them after normalize the pandemic situation.
- b. In implementation the project works after pandemic situation, we have to face the unwillingness and lack of interest of the students. So first we have to motivate them about the benefits of carrying out these types of projects beyond their UG class teaching learning schedule. After getting motivation, students were engaged in the project spontaneously and completed the above mentioned projects in due time.
- c. To implement the programme successfully and fruitfully we wish to suggest that the scheme should be extended with financial support for Star Status.

## 9. Key performance indicators

S No	Indicator	Pre-support (Chem, Zoo & Math)	During/After support (Chem, Zoo & Math)	Remarks
1	No. of students admitted	Total = 171 M = 98      F = 73 S C   S T   O B C   G   S C   S T   O BC   G 1 0 0 7 0 0 09 6 2 0 7 9 4 0      0	Total = 181 M = 106      F = 75 S C   S T   O B C   G   S C   S T   O B C   G 0 0 0 9 0 0 0 6 6 0 3 7 4 0 8 3	Support of DBT
2	Admission cut-off %	45% (As per university norm)	45% (As per university norm)	
3	No. of students passing out (%) Passing out / Students Appeared (pass %)	Chemistry: 13/13 = 100% Mathematics: 25/26 = 96.15% Zoology: Not appeared in final exam due to opening of the course in 2017.	Chemistry: 14/14 = 100% Mathematics: (UG) 20/20 = 100% Zoology: 19/19 = 100%	CBCS pattern & Support of DBT
4	Drop-out rates	12%	10%	
5	No. of students opting for M. Sc./ M.Tech/ PG Diploma in Science	Chemistry: 9 Mathematics: 11 Zoology: NA	Chemistry: 13 Mathematics: 19 Zoology: 15	
6	Average marks	Chemistry: 56% Mathematics: 55% Zoology: NA	Chemistry: 78% Mathematics: 85% Zoology: 85%	CBCS pattern & Support of DBT
7	No. of hands-on experime	Chemistry: 18, Mathematics (UG + PG): 27, Zoology: 14	Chemistry: 07, Mathematics (UG + PG): 08, Zoology: 04	



	nts being conducted			
8	No. of new experiments introduced	Nil	Chemistry: 10, Mathematics (UG + PG): 07, Zoology: 07	
9	Publications (Scopus indexed) /patents, if any.	Chemistry: 04, Mathematics (UG + PG): 06, Zoology: 01	Chemistry: 09 Mathematics: 01 Zoology: 00	
10	Training received by (A)Faculty (B)Student (Summer/ Winter Projects)	01	07	
11	Exhibitions/seminars/training courses conducted	03	30	
12	Books/journals subscribed from grants	NA	Department of Chemistry: Rs. 25157/-, Department of Mathematics: Rs. 223527/-, Department of Zoology: Rs. 80956/-	
13	Outreach activities (Popular lectures)	01	11	
14	Colleges mentored to apply for DBT Star College grants	NA	04	
15	Invited lectures	04	11	

•Proofs (S. No. 6-14 not more than 5 pages per departments, 1.5 line spacing 11 times roman font size) to be provided dulyattested by Principal and Coordinator.

10. Details of colleges / schools mentored during the Star Scheme Tenure (Name of college / school; class / standard; No. of students benefited; whether any mentored college applied under Star College Scheme, if yes what was the outcome.

Sl. No.	Name of the School; class / standard	Address	No. of students benefited	Distance from College
1	Bhupatinagar Kanya Vidyalaya (H.S.)	Bhupatinagar, Purba Medinipur-721425, West Bengal	58	1 KM
2	Haripur High School (H.S)	Radhapur, Purba Medinipur 721626, West Bengal	50	7 KM
3	Madhabpur M.N. Gril's High School (H.S)	Radhapur, Purba Medinipur 721626, West Bengal	26	7 KM
4	Mugberia Girl High School (MP)	Mugberia, Purba Medipur, 721425, West Bengal	10	2 KM
5	Mugberia Gangadhar High School (H.S.)	Mugberia, Purba Medipur, 721425, West Bengal	60	0.5 KM
6	Jukhia K.N. Bani Mandir High School (H.S.)	Jukhia, Purba Medipur, 721430, West Bengal	30	4KM
7	Baghadari Deshpran High School (H.S.)	Baghadari, Purba Medinipur-721425, West Bengal	10	2KM
8	Barbaria Hazra High Vidyapith (H.S)	Basudevberia, Purba Medinipur-721626, West Bengal	10	7.5KM
9	Bahadurpur Deshpran Sikhniketan (H.S)	Bahadurpur, Purba Medipur West Bengal 721626	12	7.5KM
10	Dubai Rasiknagar Vivekananda Vidyayatan (H.S)	Dubai, Purba Medipur, 721458 West Bengal	20	9 KM

**Colleges mentored to apply for DBT Star College grants: 04**

- Ghatal R. S. B. Mahavidyalaya, Purba Medinipur, West Bengal
- Y. S. Palpara Mahavidyalaya, Purba Medinipur, West Bengal
- Egra S. S. B. Mahavidyalaya, Purba Medinipur, West Bengal
- Y. S. Palpara Mahavidyalaya, Purba Medinipur, West Bengal

As outcome, only one college Egra S. S. B. Mahavidyalaya has been awarded with Star College Strengthening Scheme during 2022-23 session.

11. Details of increase in the faculty generated resources viz. extramural research grants from other funding agencies to strengthen the Star College Scheme efforts.

<b>Name of the Project/ Endowments, Chairs</b>	<b>Name of the Principal Investigator</b>	<b>Department of Principal Investigator</b>	<b>Year of Award</b>	<b>Amount Sanctioned</b>	<b>Duration of the project</b>	<b>Name of the Funding Agency</b>
A comparing study of synthetic fibers reinforced epoxy composite with locally available Areca nut & Mat stick natural fibers reinforced new elastomeric modified epoxy composite	Dr Bidhan Chandra Samanta	Chemistry	2020	1.35	3 years	Govt. of West Bengal Science & Technology and Biotechnology Department
Optimal Control Theory, audits, application in different environments	Dr Kalipada Maity	Mathematics	2020	7.918	3 years	Govt. of West Bengal Science & Technology and Biotechnology Department

12. SOPs developed, lab manuals created and uploaded on website or submitted to DBT.

Lab manuals with SOPs for Chemistry have been created and uploaded on the college website. The links are provided below:

<https://www.mugberiagangadharmahavidyalaya.ac.in/Files/1705770840LABORATORY%20MANUAL.pdf>

<https://www.mugberiagangadharmahavidyalaya.ac.in/Files/1706031724SOP%20CHEMISTRY%20LABORATORY.pdf>

### 13. Self-evaluation

Department	*Objective (as stated in proposal)	% achieved	Reasons for underachievement / If achieved, state in quantitative metrics
Chemistry Zoology Mathematics	<p>1. To strengthen the academic facilities and physical infrastructures by means of sufficient labs, proper guidance, inspiring and motivating teaching and learning techniques.</p> <p>2. To motivate the students to learn and understand the basics of the subject and become aware of the practical fields by utilizing the earned knowledge and also to stimulate their original thinking through hands-on exposure.</p> <p>3. To meet the needs of latest UGC curriculum (CBCS) and to provide more exposure of research facilities for faculties and UG &amp; PG students to develop their innovative thinking.</p> <p>4. To set up updated Bio-technology based laboratory for serving the agrarian community to generate employment and to develop their economy and health.</p> <p>5. To enrich the departmental library with adequate number of high-quality books, IT based facility to augment source of knowledge for our students.</p>	85% In each department	<p>1. Due to the lock down situation in most of the periods in colleges and universities for COVID 19 pandemic, we have faced difficulties in many ways also during the first and second years of grant received.</p> <p>2. Due to various technological problems raised during this lockdown period, we are unable to set up updated Bio-technology based laboratory for serving the agrarian community to generate employment and to develop their economy and health.</p>

\* For quantitative analysis you may fix five objective (max) each having 2 marks and accordingly calculate the matrix.

*Bidhan Chandra Samanta*

Course Coordinator  
(With Seal)

**Dr. Bidhan Chandra Samanta**  
Associate Professor  
Dept. of Chemistry  
Mugberia Gangadhar Mahavidyalaya

*[Signature]* 22.04.2024  
Head of the Institution  
(With Seal)

**Principal**  
Mugberia Gangadhar Mahavidyalaya

