

⊠dumkalcollege@gmail.com

### **DUMKAL COLLEGE**

P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

### 2<sup>ND</sup> CYCLE NAAC ACCREDITATION PROCESS – 2024

Criterion 6: Governance, Leadership and Management

Key Indicator: 6.5 Internal Quality Assurance System

Metric: 6.5.1 Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes. It reviews teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals and records the incremental improvement in various activities



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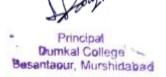
### **Internal Quality Assurance System**



### **Strategies of IQAC**











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Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes. It reviews teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals and records the incremental improvement in various activities

- 1. The IQAC plans to request the Principal to do the needful for the purchase of books and periodicals for the Central Library of the college.
- 2. As per UGC guidelines, the IQAC plans to approach the Principal to take initiative to make arrangement for signing MOU with different institutions for academic purposes.
- 3. The IQAC feels it necessary to install microphone system in two large halls used as class rooms (205 and 301) for enhancing the teaching-learning experience.
- 4. The IQAC has helped to complete the process of Career Advancement Scheme (CAS) for the faculty members.

IQAC instructs departments to hold syllabus-based internal assessment/ project evaluation.

Also following initiatives are taken by IOAC:

- a. To get the real picture, all students are welcome to provide comments on the teachers, the teaching and learning process, and the evaluation.
- b. Following an assessment of the student feedback, the teachers are instructed accordingly.
- c. IQAC oversees the quality process of student-centered teaching and learning using ICT, projectors etc.
- d. The IQAC guide teachers to provide remedial instructions and reviews to the students whenever necessary.







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The IQAC plans to request the Principal to do the needful for the purchase of books and periodicals for the Central Library of the college.

Take Meeting - 03/2021-2022	conference Hall
Date of Meeting 18/02/2022	Time - 3:00 P.M.
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annuangement to engage	some Guest Teachers
in the departments of physi	cs, Mathematies,
bengali and Philosophy as	these departments
have depleiency of stequires	a number of teachers,
. The land suggested the Pail	united to accorde
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Assistant Professon of chemist	
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Level 12 to Level 13 A .	
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Trincipal to approach The s	HI, Glovennuent of
west Bengal and the Univer	usity of Kalyana
respectively for seeking the	a names of DPI
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Day, Assistant Professor of Stage 11 C poom Level 10 to Le	History from stage 1 to
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The lake felt it necessary to stequest. The Principal to approach the DPI Government of West Bengal for the fixation of pay on account of acquiling in service tho on 10,4,2017 of Achimya Kuman Gangopadhyay with advance inchements for PhD as pen Memo Ho. 986-ED/2016 dated 24/11/2016, Education Disactorate Government of West Bengal. 1 The lake took decision to nequest the Partneipal to make necessary steps to sushippe all the committee and sub-committees involved in different activities of the college 7. The lane took decision to sequed the Brincipal to make necessary step to inchase student participation in Learning by having more students presentions seminar and to organise special tectures by distinguished alunni through seminars. 2. Resolved manimomly that the principal be stephested to take all necessary steps to make annungement too pur chase of sufficient umber of Laboratory equipment for the Science deportments and for purchase of books in central Library of the college 9. The IDAC felt it necessary to sequest the Paluelpol to disect the Librarian for maring necessary annuagement for introducing a cannot guidance corner in the central library. 15000 Principel Dumkal College, dasantapur Dumkal, Murshidabad







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### **Exhibition of newly purchased books**



# **College Library**







P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

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The IQAC plans to approach the Principal to take initiative to make arrangement for signing MOU with different institutions for academic purposes

2. Spring in Rom. E. Decati Melblu E Debasis Bandy opadyy Avindom Bizzyas Hall Boy Conference Hall Date of IAAC Meeting Meeting No. 01/2022-25 Resolutions: -I The Parincipial took the chair and the meeting started. The proceedings of the polexious meeting were confirmed manimously. Resolved unanimously that the Polincipal be requested to take necessary steps to expedite (thorough already notified) the CAS of Dr Soudip Kuman Rajak, Assistant professor of Chemistry (from Stage III / Level 12 to Stage IV / Level 13 4) and do the needput to inform the DPI for processing the ungradation from SACTII to SACTI of Samini Mondal, Dept of Political Science, Strain Su. Dept. of Physics; Surgit Saha Dept. of Physics. Abida Sultain, Dept. of English. 3. Also resolved that the finitebook be requested to take necessary steps for formetion of different committees as proposed in this meeting. (4) Internal Quality Assumance Cell, (b) NAAC committee -( ) Finance Committee (d) Punchase committee (e) Admission committee, (f) Library committee, (h) Sports and cultural committee; (i) Website and college Hotice Board Updating committee (i) Student welfare commite. (K) Women cell (L) Sexual Hanassment Rednessalcell, (h) PF committee (n) Ghievance Redressal Cell. 4. The principal be also requested to take necessary steps for newewal of the SMS parage medad for students admission and other official purpose. 5. The parincipal be also sugmested to take Initiative to mane ann angement and sign Mou with different institutions for academic pumpose 6. The meeting ended with thomas to the chair. Principal

Dumkal College, Basanuspur

Oumkal, Murshidabad



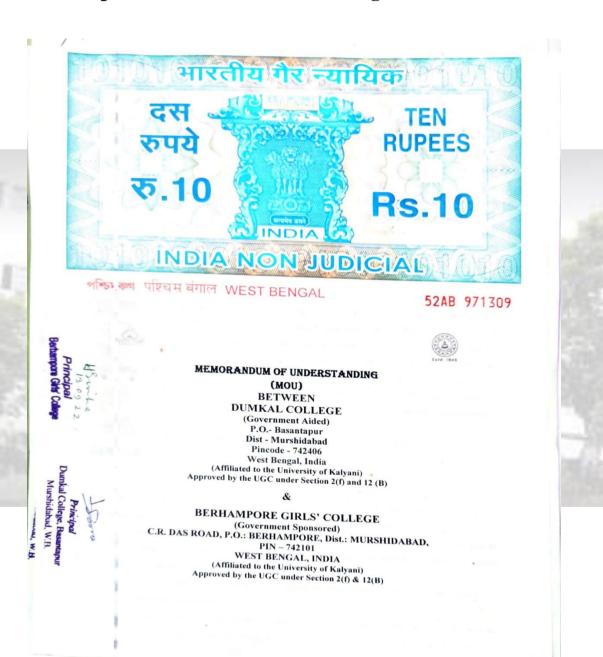




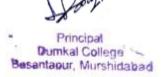
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### Sample MoUs with different Colleges with activities









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### 1. Parties to the Agreement and the Legal Framework;

The Memorandum of Understanding (MoU) is entered into on this 13th day of September, 2022 towards the establishment of an Agreement by and between:

 DUMKAL COLLEGE, a Government Aided Undergraduate Degree College located at Basantapur, Dist.: MURSHIDABAD, PIN - 742406, State: WEST BENGAL, INDIA established in 1999 referred to as DUMKAL COLLEGE, affiliated to the University of Kalyani, Recognized by the UGC under Section 2(f) and 12 (B), represented by its Principal and referred to as FIRST PARTY (which term or expression shall unless excluded by or repugnant to the contest be deemed to mean and include its successor in office representatives, administrators and assigns) for the exchange of students, and faculties for purely academic purpose.

AND

BERHAMPORE GIRLS' COLLEGE, a Government Sponsored Girls' College running with Post Graduate Programmes located at C.R. DAS ROAD, P. O.: BERHAMPORE, Dist.: MURSHIDABAD, PIN - 742101, State: WEST BENGAL, INDIA established in 1946 referred to as BGC, remained Affiliated to the University of Calcutta till 1999 and thereafter Affiliated to the University of Kalyani, Recognized by the UGC under Section 2(f) & 12(B) and represented by its Principal and referred to as SECOND PARTY (which term or expression shall unless excluded by or repugnant to the contest be deemed to mean and include its successor in office representatives, administrators and assigns) for the exchange of students, and faculties and infrastructural facilities for purely academic purpose.

Note: Both these institutes will be hereafter referred to as Parties.

#### 2. Vision of the Agreement:

This agreement is drawn with a view to espouse the principles, policies, visions and objectives of the National Education Policy 2020. The Policy suggests a "seamless integration and coordination across institutions and across all stages of education". Both the institutions have the philanthropic visions to be fulfilled with regard to the MoU, which are:

- Whereas the two colleges agree upon to carry forward the ethical values and to inculcate the value of education so that the learners can face the challenging future confidently and successfully;
- · Whereas the two colleges agree upon to evolve the institute as the centres of academic excellence;
- Whereas the two colleges agree upon to construct a platform for the exploration of the potentialities of the learners to be acquainted with the global knowledge society;
- Whereas the two colleges agree upon for striving to engage the students in meaningful extension activities and community welfare works.

Dumkal College Besantapur, Murshidabad



P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin-742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

#### 3. Preamble:

#### 3.1. Understanding of Cooperation:

Whereas DUMKAL COLLEGE and BERHAMPORE GIRLS' COLLEGE agree that cooperation in research collaborations, students, and faculty exchanges and collaborations with regard to infrastructural facilities would be mutually beneficial. The areas of cooperation may include, subject to mutual consent, any desirable and feasible activity that would further the goals of each institution with regard to academic collaboration.

Therefore, pursued by the goal of common interest DUMKAL COLLEGE and BERHAMPORE GIRLS' COLLEGE have intended to decide into the Memorandum of Understanding (MoU), of which components for the cooperation are well-defined in the following Sections:

### 3.2. Article (i). Purpose of the Agreement:

- The broad Objectives of this agreement are to promote educational and scholarly exchange, academic collaboration between the parties involved as educational partners.
- Upon the mutual consent of both the parties, academic cooperation will be carried out in, but not necessarily limited to, the following activities:

### A. Faculty/Staff exchanges

- a. Both the institutions will promote: the exchange of faculty for the common UG Honours & Programmes Courses
- b. Faculty exchange for mutual benefit of both the institutions.
- Collaboration in teaching, research and development, and consultancy studies in the field of mutual interest.
- Exchange of academic materials and publications.
- Conducting lectures with the opportunity to teach or conduct research.
- Undertaking joint research wherever feasible.
- Participating in seminars, workshops, symposia, other kinds of academic discourses.
- h. Conducting study tours and joint consultancy work wherever feasible.

A specific plan will be worked out for each activity and detailed arrangements for such collaborative work will be agreedupon

#### B. Student Exchange

- a) Students exchange programme will be conducted on mutual understanding between two colleges.
- b) Exchanged students may be evaluated by the host institution if such an evaluative framework for the academic interest of students be worked out. This will in no way impede or influence her/his evaluation in own college or university assessment/ evaluation.





Dumkal College Besantapur, Murshidabad



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#### C. Other areas

- To exchange information and experiences on research and educational programmes.
- b) To exchange information on teaching, learning material and other literature relevant to their educational andresearch programmes.
- c) To organize seminars, faculty development programmes, workshops jointly on topics of mutual interest and to invite each other's faculty to participate therein.
- d) To explore the provision of cultural and intellectual enrichment opportunities for staff, faculty and students of both the institutes.
- e) To use library reading room facilities for a specified period.
- f) To use Computer laboratory and I.C.T. facilities in specific cases (with prior approval of Head of the Institutions) for a limited period.

Note: DUMKAL COLLEGE and BERHAMPORE GIRLS' COLLEGE agree with the detailed terms and conditions that would guide each activity as identified above and that will be identified jointly and these will be agreed upon by the two colleges. These will also include the technical description of the proposed activity and the financial arrangements and the person(s) responsible for its implementation.



- A Coordination Committee consisting of two Heads and two Coordinators and quite a few members from each college will steer up the joint initiative and that will periodically (once in a year) review the activities and identify new innovative areas of
- The specific activities to be carried out under this Agreement will be started in corresponding specific Sub-agreements. Once such Sub-agreements are approved by the both parties that will be attached as annexes to this agreement. The specific Subagreements will demonstrate the Objectives, Conditions and the Way of Execution, Financial Arrangement, Period of Execution and the Administrative Responsibilities of the two parties.

3.2. Article (iii). Confidentiality of the Agreement and the Protection of Intellectual Property Rights (IPR):

- The two colleges will maintain reciprocal relations and retain and respect individual confidentiality including those pertaining to the collaborative activities of both the Colleges.
- The Agreement will respect Intellectual Property Rights (IPR) and any intellectual matter developed by the collaborative efforts shall be retained by them.

#### 3.2. Article (iv). Duration, Amendment and Expiration of the Agreement:

The Agreement will come into effect after being signed by both parties and will be established for a period of 05 (five) years. After the completion of this period, the Agreement



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will automatically be extended for another 05 (five) years, unless one of the Parties expresses an intention (in written form) to cancel the Agreement at least 90 (ninety) days before the expiry date. The Agreement may be amended at any time by mutual agreement in writing as an addendum. The Amendment, Termination and Expiration of the Agreement will not affect the terms of activities ongoing at the time of Notification of Amendment, Termination and Expiration, unless otherwise agreed upon between the Parties.

#### 3.2. Article (v). Non-Exclusivity:

The Agreement is a Non-exclusive Agreement and both Parties remain free to enter into similar Agreements with other parties.

#### 3.2. Article (vi). Special Provisions:

- (a) Each Party will take approval from the other Party in writing prior to using the Later's name and Logo for the activities here under on a case by case basis;
- (b) Neither Party can misuse this MoU by involving the name of the other without the written consent from the other Party;
- (c) There will be no vested interest by neither of the party involved apart from quality enhancement.

#### 3.2. Article (vii). Dispute Resolution:

In case of any dispute relating to any aspect of Academic Activity, the Head of the institutions of both the colleges will jointly resolve the dispute by amicable means in a spirit of independence, mutual respect and cooperative responsibility.

DOMKAL GIRLS' COLLEGE and BERHAMPORE GIRLS' COLLEGE welcome the signing of this Memorandum of cooperation and jointly agree to the provisions set out as above.

FOR DUMKAL COLLEGE

Name: Dr. Bhabesh Pramanik Designation: Principal

Designation: Principal
Date: 13.69.22 Principal
Dumkal College, Base

SEAlMurshidab

1. Witness:

Name: Sandip kumar Rayi Designation: Assertal Pril

Date: 13. 9.2022

FOR BERHAMPORE GIRLS' COLLEGE

HSin hs. cg. 2022 Name: Dr. Hena Sinha Designation: Principal

Principal
SE Berhampore Girls' College

2. Witness:

Designation: Accident Professor Date: 13.9.22

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#### Memorandum of Understanding between

Dumkal College, Basantapur, Murshidabad & Berhampore Girls' College Berhampore, Murshidabad

#### Report on MoU Activities

Session: 2022-2023

> Institution(s) under MOU:

Dumkal College and Berhampore Girls' College

- > Date of agreement and duration: 13.09.2022 duration: up to 12.09.2027
- > Purpose of MOU:

To excel in our shared academic areas of interest.

> Activities Conducted:

Both institutions have facilitated the exchange of faculty for undergraduate Honours and Programme Courses. (A detailed report on faculty exchange is attached herewith.)

#### > Outcomes:

- The Faculty Exchange programme between Dumkal College and Berhampore Girls' College has been a successful endeavor, enriching the teaching and learning processes at both institutions.
- Visiting faculties from both colleges have exchanged valuable ideas and knowledge, benefiting both parties.
- The exchange programme offers temporary faculty support to departments facing a shortage of teachers. Faculty members from both colleges contribute by teaching specific courses or portions of the syllabus.
- Students from both colleges benefit from exposure to diverse teaching methodologies employed by the visiting faculties.

Hinha

Dr. Hena Sinha Principal Berhampore Girls' College Berhampore, Murshidabad.

Principal
Berhampere Cirls' College

Bouns

Dr. Bhabesh Pramanik Principal Dumkal College Basantapur, Murshidabad.

Dr. BHABESH PRAMANIK
Principal

Dumkal College, Basantapur
Dumkal, Murshidabad









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### Detailed Report of Faculty Exchange Programme

This is to certify that as a part of this MoU both institutions have promoted faculty exchange programme for their mutual benefit. Following teachers have taken classes.

#### Class Details:

Name of the Teacher	Designation	Affiliating Institution	Date	Semester	Course
Dr. Sandip Kumar Rajak	Associate Professor	Dumkal College	06.3.2023	4 <sup>th</sup>	CC-T-8
Dr. Swati Mollah	Associate Professor	Dumkal College	20.3.2023	6 <sup>th</sup>	CC-T-14
Manas Kumar Das	Assistant Professor	Dumkal College	06.3.2023	2 <sup>nd</sup>	CC-T-03

#### Class Details:

	Institution	Date	Semester	Code
Associate Professor	Berhampore Girls' College	03.4.2023	4 <sup>th</sup>	CC-T-8
Assistant Professor	Berhampore Girls' College	03.4.2023	6th	CC-T-14
SACT	Berhampore Girls' College	08.4.2023	4 <sup>th</sup>	CC-T-8
	Assistant Professor	Professor Girls' College  Assistant Berhampore Girls' College  SACT Berhampore Girls'	Professor Girls' College  Assistant Berhampore Girls' College  SACT Berhampore Girls' College  SACT Berhampore Girls' Girls' College	Professor Girls' College  Assistant Berhampore Girls' College  SACT Berhampore Girls' O8.4.2023 6th  6th  08.4.2023 4th

Heinha Dr. Hena Sinha

Principal
Berhampore Girls' College Berhampore, Murshidabad

Principal

Dr. Bhabesh Pramanik Principal Dumkal College Basantapur, Murshidabad

Dr. BHABESH PRAMANIK

Principal

Dumkal College, Basantapur

Dumkal, Murshidabad





Dumkal College -Besantapur, Murshidabad





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পশ্চিমবুজা पश्चिम बंगाल WEST BENGAL

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### MEMORANDUM OF UNDERSTANDING

HAZI A.K.KHAN COLLEGE
HARIHARPARA, MURSHIDABAD
AND
DUMKAL COLLEGE
DUMKAL, MURSHIDABAD

## FOR DEVELOPMENT OF ACADEMIC COOPERATION IN THE COLLEGES, MENTIONED

The general objective of this Memorandum of Understanding (MoU) is to stimulate and facilitate development of collaborative and mutually beneficial programmes which definitely enhance the intellectual life and cultural development of both the institutions, and to contribute towards inter-college cooperation. Thus, Hazi A.K.Khan College and Dumkal College have agreed to transact some academic activities in support of their mutual interests in the field of education and research:

- 1. Both the colleges will:
  - a) Cooperate in exchange of information relating to their activities in teaching and research;
  - Promote joint research projects and joint courses of study, focusing on internationally funded projects;
  - c) Attempt to encourage students and staff to spend requisite time in the host
  - d) Conduct short courses, cultural projects and study tours in joint collaboration, with written agreement, prior to commencement of these activities;





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2. Accreditation for academic work carried out by any student during the period of study at the host College will go to the discretion of the student's home college.

3. Admission to a specific Department or Course is subject to a student being satisfactorily qualified for the chosen area of study and the availability of resources in the period for which admission is sought.

4. The aim of the Memorandum of Understanding shall be to attain equality in respective contributions and achievements, which shall be reviewed periodically from both ends.

All other financial matters, including travel costs, are subject to negotiation, and will normally be the responsibility of the persons involved and decisions of their home

The host College will agree to provide work space, access of Library and avail technical facilities accordingly.

This agreement will take effect from 7th September, 2022 to 30th June, 2027 unless sooner terminated, revoked or modified by mutual written agreement between the parties and may be extended by mutual written agreement.

Either party may terminate the Agreement at any time producing a three months' prior notice to the other party.

Gatam Kumas ahox Principal Signgurook Minuipablege Hadistik Rifah College

Hariharpara, Murshidabad, 742166 haziakkhancollege@yahoo.com

Witness -1.

Bidisha Munchi

07.09.2022

Berles Francis

Signature of Principal Dumkal College Dumkal, Murshidabad, 742406 dumkalcollege@gmail.com

Witness -

Dumkal College -Besantapur, Murshidabad





P.O- Basantapur, P.S- Dumkal, Dist.- Murshidabad, West Bengal, Pin- 742406 (Govt. Aided, Affiliated to the: University of Kalyani Included under section 2(f) & 12 (B) of UGC Act.)

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### Memorandum of Understanding

between

Hazi A. K. Khan College, Hariharpara, Murshidabad & Dumkal College, Basantapur, Murshidabad

## Report on MoU Activities Session: 2022-2023

Institution(s) under MOU:

Hazi A. K. Khan College and Dumkal College

\* Date of agreement and duration: 07.09.2022 duration: upto 30.06.2027

\* Purpose of MOU:

to gain excellence in the academic areas of mutual interest.

\* Activities Conducted:

Both the institutions have promoted the exchange of faculty for common UG Honours & Programme Courses. (Detailed Report of faculty exchange is enclosed herewith)

Outcomes:

The Faculty Exchange programme between Hazi A.K. Khan College and Dumkal College is a successful initiative that helped to enhance the teaching learning process of both colleges.

- Visiting faculties from both colleges shared and brought back some valuable ideas and knowledge.
- The exchange initiative provides temporary faculty support to the Departments where there is lack of sufficient teachers. The faculties of both colleges assist in teaching certain courses or portion of the syllabus.
- Students of both colleges are also benefitted from exposure to different teaching methodologies employed by the visiting faculties.

Dr. Goutam Kumar Ghosh

Principal

Hazi A. K. Khan College

Hariharpara, Murshidabad

Principal
Hazi A.K. Khan College
Hariharpara, Murshidabad

Dr. Bhabesh Pramanik

Principal

Dumkal College

Basantapur, Murshidabad

Principal

Dumkal College, Basantapur

Murshidahad, W.B.



Principal





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#### **Detailed Report of Faculty Exchange Programme**

This is to certify that as a part of this MoU both institutions have promoted faculty exchange programme for their mutual benefit. Following teachers have taken classes.

#### Class Details:

Name of the Teacher	Designation	Affiliating Institution	Date	Semester	Course Code
Dr. Munmun Dutta Assistant Professor of Philosophy College	Assistant Professor	Hazi A. K. Khan	22.05.23	4th	PHIL-H-CC-T-VIII
	College	ge	6th	PHIL-H-DSE-T-III	
Emanual Hansda Assistant Professor Hazi A. K. Khan of Philosophy College	13.12.22	5th	PHIL-H-DSE-T-III		
	of Philosophy	College		1st	PHIL-H-CC-T-I
Dr. Pulokes Mandal	dal Assistant Professor Hazi A. K. Khan 22.03 of Bengali College		22.05.23	4th	BENG-H-CC-T-VIII
				6th	BENG-H-CC-T-XIV
Dr. Nanigopal Malo	Assistant Professor	or Hazi A. K. Khan College	14.12.22	3rd	BENG-H-CC-T-XI
	of Bengali			1st	BENG-H-CC-T-I

#### Class Details:

Name of the Teacher	Designation	Affiliating Institution	Date	Semester	Course Code
Arnav Debnath	Associate Professor of Political Science	Dumkal College	03.12.22	5 <sup>th</sup>	POL-H-CC-T-XII
			27.04.23	4 <sup>th</sup> 6th	POL-H-CC-T-IX POL-H-CC-T-XIV
Dr. Swati Mollah	Associate Professor of Geography	Dumkal College	07.12.22	1st 3rd	GEO-H-CC-T-I GEO-H-CC-T-V
Dr. Prasenjit Kr Mondal	Assistant Professor of Geography	Dumkal College	16.12.22	5 <sup>th</sup> 3rd	GEO-H-CC-T-XI GEO-H-CC-T-VI
Arindam Biswas	Assistant Professor of Geography	Dumkal College	12.04.23	lst	GEO-H-CC-T-II
			04.04.23	1st	GEO-H-CC-T-I

Dr. Goutam Kumar Ghosh

Principal

Hazi A. K. Khan College

Hariharpara, Murshidabad

Principal Hazi A.K. Khan College Hariharpara, Murshidabad Dr. Bhabesh Pramanik

Principal

**Dumkal College** 

Basantapur, Murshidabad

Principal

Dumkal College, Basantapur Murshidabad, W.B.





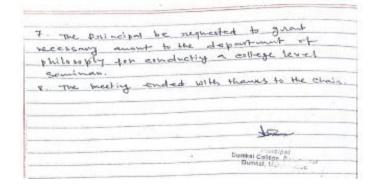


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### Introduction of Microphone by IQAC

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	rated the meeting. The pascreating of the previous
ye4	eting were confirmed manimumly.
1.	The principal be requested to purpose the matter
ď.	pay fixation of Dr. Tanchan Hollah, Assistant
	spessor of Mathematics, on the basis of his the accordi
1	The late, requested the principal to do the
W.	edted for the purchase of hours and periodicals
40	n the contrad Library of the college.
4.	The IQAC feels it increasing to install mich up-
- 1	nove system in two large halls used as claim
200	oms (205 and 301) for enhancing the teaching-
1	earning experience.
5.	The TARC requested all featily members to
-	attend different academic courses of the
50	henever and whenever it is possible for the
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6.	The late feels it desirable to make commy to
les	displaying at work toos daily newspaperes
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-	be moved of the college.







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IQAC takes initiatives for Career Advancement Scheme (CAS) of Teachers

Date of IRAC Meeting 23 11.7612 confermor man Carlienmot, Wall Meeting No. 03/2022 - 2023 1. Beatents Danson 2 - Soulif to Rein > Khoudhui 4. Desate Mollale S. Skange solnot 6. Tomel or make 7 Debails Gandyspading 8. Arradone Brown. 9. KONNO Resolutions :-In The portionized took the chain and meeting stanted. The proceedings of the previous meeting of the parevious meeting, were continued ungentano wely. 2/ Resolved manumously that the Paincipal be requerted to take necessary steps to expedite the CAG of Dr. Sandtp Kuman Rojan, Assistat Profession of chemistry ( from stage III / Level 12 to Stage IV/ Level 13 4), short Manas Kuman Dan, Assistant Profession of Alston Cravel 10 to Level 11) and Debanita Kanmanan Librarian of the college ( from stage I / Level 16 to stage to inform the DPI and the concerned university for hecessary action. 3) The House felt It necessary to supplied the exinciple to grant on buty heave to yash Hunce, Assistant Profession of checulatory and Dr. Tanchan Molla, Assistant Professon of that he matter for altending Faculty Developmet. Programme and Represent course respectively. tragramme to request the Pulselpalto take necessary to request the Pulselpalto take necessary steps to fill up the recent post of Accistant Professor of Physics Class recent by Do Pranab Kunan Bend s. The meeting and ed with thanks to chain. Dumbat e







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# **Regular Internal Evaluation Internal Questions**

#### **Dumkal College**

U.G. 5th Semester 1st Internal Examination-2022

### MATHEMATICS [HONOURS]

#### Course Code: MATH(H)CC-T-11 & MATH(H)CC-T-12

Full Marks: 10+10 Time: 1 Hour

The figures in the right- hand margin indicate marks. Symbols have their usual meaning.



1. Answer any three questions:

- $3 \times 2 = 6$
- (a) Give an example of a linear, semilinear, quasilinear and non-linear first order PDE.
- (b) Find the characteristics curves and the PDE  $u_{xx} + xu_{yy} = 0$ , x < 0.
- (c) Eliminate the arbitrary function and form the PDE from  $z = f(\frac{xy}{z})$ .
- (d) Find the general integral of the equation  $p + 3q = 5z + \tan(y 3x)$ .
- 2. Answer any one question:

- $1 \times 4 = 4$
- (a) Reduce the equation  $\frac{\partial^2 z}{\partial x^2} = x^2 \frac{\partial^2 z}{\partial x^2}$  to canonical form.
- (b) Find the solution of Cauchy problem  $u_x + xu_y = 0$  with  $u(0, y) = \sin y$ .

#### MATH(H)CC-T-12

1. Answer any three questions:

 $3 \times 2 = 6$ 

- (a) Define external direct product of groups.
- (b) Show that the direct product  $\mathbb{Z}_4 \times \mathbb{Z}_6$  of the cyclic groups  $\mathbb{Z}_4$  and  $\mathbb{Z}_6$  is not cyclic.
- (c) Let G be a group and Z(G) the center of G. If  $a \in Z(G)$ , then prove that  $cl(a) = \{a\}$  and conversely.
- (d) State the Cauchy's theorem on finite groups & also Cauchy's theorem on finite abelian groups.
- 2. Answer any one question:

- $1 \times 4 = 4$
- (a) Let  $G_1, G_2, ..., G_n$  be n groups. Show that  $Z(G_1 \times G_2 \times ... \times G_n) \simeq Z(G_1) \times Z(G_2) \times ... \times Z(G_n)$ .
- (b) Find the conjugacy classes in  $S_3$  and write down the class equation.

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#### **Dumkal College**

U.G. 5<sup>th</sup> Semester 1<sup>st</sup> Internal Examination-2022

#### MATHEMATICS [HONOURS]

#### Course Code: MATH-H-DSE-T-01 & MATH-H-DSE-T-02

Full Marks: 10+10 Time: 1 Hour

The figures in the right-hand margin indicate marks. Symbols have their usual meaning.

#### MATH-H-DSE-T-01

1. Answer any five questions:

- $5 \times 2 = 10$
- (a) Reduce the following problem in its standard form:

Maximize 
$$Z = 2x_1 + 3x_2 - x_3$$

Subject to

$$5x_1 - x_2 + 7x_3 \ge 3$$

$$x_1 + x_2 - 3x_3 \le -2$$

$$4x_1 + x_2 \le 1$$

$$x_1, x_2, x_3 \ge 0.$$

- (b) Define convex set, degenerate and non-degenerate basic feasible solution.
- (c) Examine whether the following set is convex:

$$X = \{(x_1, x_2) : x_1 \ge 2, x_2 \le 3, x_1, x_2 \ge 0\}.$$

(d) Prove that  $x_1 = 5$ ,  $x_2 = 0$ ,  $x_3 = -1$  is a basic solution to the set of equations

$$x_1 + 2x_2 + x_3 = 4$$

$$2x_1 + x_2 + 5x_3 = 5.$$

- (e) Prove that dual of the dual is the primal itself.
- (f) Show that whatever may be the value of a, the game with the following payoff matrix





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is strictly determinable:

$$\begin{array}{c|cccc}
 & B_1 & B_2 \\
A_1 & 3 & 7 \\
A_2 & -3 & a
\end{array}$$

(g) Apply the maximin & minmax principle to solve the game whose payoff matrix is given bellow

	$B_1$	$B_2$	$B_3$
$A_1$	-1	-2	4
$A_2$	-1	1	2
$A_3$	2	2	6

#### MATH-H-DSE-T-02

1. Answer any three questions:

 $3 \times 2 = 6$ 

- (a) State the Tchebycheff's inequality.
- (b) 5 coin are thrown simultaneously. Find the probability of getting at least 3 heads.
- (c) For a random variable X, find the lower bound of the probability  $P(\mu-2\sigma \leq X \leq \mu+2\sigma)$ , where  $\mu$  and  $\sigma$  are mean and variance respectively.
- (d) Find the probability that there may be 53 sundays in a leaf year.

2. Answer any one questions:

 $1 \times 4 = 4$ 

- (a) The integers x and y are chosen at random with replacement from nine numbers 1, 2, 3, ..., 8, 9. Find the probability that  $|x^2 y^2|$  is divisible by 2.
- (b) State and prove Strong Law of Large Number Theorem.

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# DUMKAL COLLEGE/CHEMISTRY(HORS)/CC-12/SEM-5/INTERNAL EXAM 2021 FM-20 Date: 17.1.2021 T1ME-90MIN

1. Answer any two questions: 1X2=2

a) Write the expression for Morse potential explaining all terms.

b) What is the condition to be microwave active?

e) Define Chemical shift

2. Answer any two questions: 2X2-4

(a) What is Born-Oppeheimer approximation,

(b) Give two example of ESR active compound and why these are ESR active explain.

(c) Why molecule cannot have zero energy at its ground state?

3. Answer any two questions: 3X2=6

(a) The fundamental and first overtone transition of NO molecule are centred at 1867 cm<sup>-1</sup> and 3724 cm<sup>-1</sup> respectively. Evaluate the equilibrium vibration frequency

(b) How many degrees of freedom (vibratonal) does CO<sub>2</sub> have? How vibrational frequency is related to force constant?

4. Answer any two questions: 4X2=8

(a) Explain with mathematical equation the type of pure rotational Raman spectrams expected for diatomic molecule.

(b) Write an expression for rotational-vibrational energy of rigid rotor with harmonic vibration. What are the selection rules for a rigid rotor with harmonic vibration? How do they change for a non-rigid rotor with anharmonic vibration?

(c) Given the bond lengths of  $\mathrm{H}^{38}\mathrm{Cl}$  and  $\mathrm{D}^{38}\mathrm{Cl}$  as 1.27A, calculate the rotational constant of these two molecules. (Mass of H atom=1.0079 and of D=2.0141 units)







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☑dumkalcollege@gmail.com

### DUMKAL COLLEGE

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Date:10.11.2022

### Internal Examination 2022, Department of Chemistry

Assignment for of 5th semester Hons core course:

Inorganic:

1. Write in detail the Gouy method of measurement of magnetic susceptibility. What is Curie temperature?

2. At room temperature, the observed value of  $m_{\text{eff}}$  for  $[\text{Cr(en)}_3]\text{Br}_2$  is 4.75 mB. Is the complex high- or low-spin? en is the abbreviation of 1,2-Ethanediamine.

Organic: Microwave assisted organic reaction in organic and water solvent reflecting the advantages over conventional methods

Physical: Write a short note on capillary action. [ keyword- Definition, capillary rise, height of the liquid in capillary tube in different condition. ]

#### Assignment for 5th semester Programme course:

Write down a short notes on i) Carbonization of Coal ii) Octane number iii) Antiknock compounds.

\*\*\*All students are noticed to submit the assignments (hard copy) within 25.11.2022. After the last date of submission, no assignment will be accepted.

Head or the Department Depi of CHEMISTRY Dunkal Chilege, Basentapur





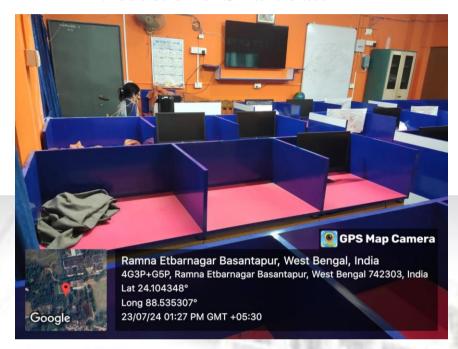


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### **Introduction of Smart class**

### Geography



### Chemistry



