



Syllabus & Regulations

For

2- Year 4-Semester M. Sc. Course in Chemistry

**Ramakrishna Mission Vivekananda Centenary
College, Rahara**

Affiliated to

West Bengal State University

Barasat

2008

**Syllabus and Regulations for
Two-Year (Four Semester) M. Sc. Course in Chemistry at
Ramakrishna Mission Vivekananda Centenary College, Rahara
Affiliated to
West Bengal State University, Barasat**

1 The examination for the degree of Master of Science (M. Sc.) shall consist of four semesters: Semester-I, Semester-II, Semester-III,- and Semester-IV. Each semester examination will be held after the completion of all the papers for that particular semester and before the next semester begins, commencing on such dates and time as will be decided by the College/ University authority and will be duly notified. Total duration of the course is two years [hereafter, “Course” refers to M. Sc. Course in Chemistry and “Paper” refers to the individual papers of 75/80/90/100 marks divided into two halves: Group-A: Theoretical (50-marks) and Group-B : Practical: (25/30/40/50 marks)]. The duration of the semester examination shall be as follows ordinarily:

Semester	Duration
Semester-I	July to December
Semester-II	January to June
Semester-III	July to December
Semester-IV	January to June

Course Structure

2. The course will consist of 12 papers of 75/80/90/100/-marks (Group-A :Theoretical-50 Marks) and Group-B : Practical- 25/30/40/50/-Marks) each. The examiners shall forward assessment in respect of every candidate to the Principal / Controller of Examination / Coordinator P. G. Courses (as the case may be) for tabulation of the results.

3.(a). The entire course of 1000 marks has been divided in to 12 papers of 75/80/90/100/ marks of which 9 papers (papers: I-IX, included in Semesters I-III) (Total: 750-marks) are **compulsory common (General) papers** and 3 papers (papers: X-XII, included in Semester-IV), (Total: 250-marks), are **optional or special papers** in Inorganic Chemistry / Organic Chemistry / Physical Chemistry, any one of which has to be opted by a candidate during the fourth semester.

(b).Special papers shall be allotted on the basis of merit [in the B. Sc. Honours, Semester-I, II, and III (if available at the time of allotment) examinations taken together].

(c). Each paper is composed of a theoretical component (Group-A: 50 marks) and a practical component (Group-B: 25/30/40/50-marks).The structure and curricula of the revised syllabus for the M. Sc. Course in chemistry applicable from the academic session 2009-2010 is stated below.

Course Structure

Semester	Duration	Marks			Credit	Course type	Examination
		Theoretical	Practical	Total			
I	July-Dec.	150	100	250	25	General (G)	January
II	Jan-June	150	100	250	25	General (G)	June
III	July-Dec.	150	100	250	25	General (G)	January
IV	Jan-June	150	100	250	25	Special (S)	June
Total	2-Years	600	400	1000	100		

Special (Optional) Papers(S):

Inorganic Chemistry (IS) / Organic Chemistry (OS) / Physical Chemistry(PS).

Paper-wise Marks & Credit Distribution

Semester-I; General Papers (G) -250 Marks: 25 Credits

Papers Course ID	Subjects	Group-A (Theoretical)		Group-B (Practical)	
		Marks	Credits	Marks	Credits
Paper-I CHEM(G)-11	Inorganic Chem. Genl-1	50	5	30	3
Paper-II CHEM(G)-12	Organic Chem. Genl-1	50	5	30	3
Paper-III CHEM(G)-13	Physical Chem. Genl-1	50	5	30 (CAC-1) 10	4

CAC : Computer Applications in Chemistry

Semester-II: General Papers (G) -250 Marks: 25 Credits

Papers Course ID	Subjects	Group-A (Theoretical)		Group-B (Practical)	
		Marks	Credits	Marks	Credits
Paper-IV CHEM(G)-21	Inorganic Chem. Genl-2	50	5	30	3
Paper-V CHEM(G)-22	Organic Chem. Genl-2	50	5	30	3
Paper-VI CHEM(G)-23	Physical Chem. Genl-2	50	5	30 (CAC-2) 10	4

CAC: Computer Applications in Chemistry

Semester-III: General Papers (G) -250 Marks: 25 Credits

Papers Course ID	Subjects	Group-A (Theoretical)		Group-B (Practical)	
		Marks	Credits	Marks	Credits
Paper-VII CHEM(G)-31	Advanced General Chem.-1	50	5	25	2.5
Paper-VIII CHEM(G)-32	Advanced General Chem.-2	50	5	25	2.5
Paper-IX CHEM(G)-33	Biol. Aspects of Chemistry	50	5	25 (L.Q.) 25	2.5

L.Q.: Lab. Quiz Test [Inorg.-6 + Org.-6 + Phy.-6 + CAC-7] :Total: 25

Semester-IV: Special Papers(S):250 Marks: 25 Credits
(IS): Inorganic Special / (OS): Organic Special / (PS): Physical Special

Papers Course ID	Subjects	Group-A (Theoretical)		Group-B (Spl. Practical)	
		Marks	Credits	Marks	Credits
Paper-X CHEM(IS/OS/PS)-41	Special Theo.-1	50	5	30	3
Paper-XI CHEM(IS/OS/PS)-42	Special Theo.-1	50	5	30	3
Paper-XII CHEM(IS/OS/PS)-43	Special Theo.-1	50	5	Project & Seminar-20 Grand Viva-20	4

Theoretical Courses

5. (i). Each paper will be of Full Marks 75/80/90//100 (as the case may be). Theoretical part (Group-A) of each paper will be of 50 marks and the practical part (Group-B) will be of 25/ 30/ 40/ 50 marks (as the case may be).

(ii).Theoretical part of 50 marks of a paper shall be composed of three course units of 18/ 16/ 16 marks and each such course unit shall be covered by 16-20 lecture periods of 50-60 minutes duration.

(iii).Duration of examination of theoretical part of 50 marks of a paper shall be 2 hours. Two questions shall be set from each course unit, of which one question has to be answered.

(iv).For the theoretical portion of each paper, questions shall be set and the scripts examined by a set of at least two examiners appointed from among the teachers of the department offering the respective courses, including the guest teachers (if any) appointed by the Principal / Vice Chancellor / appropriate authority of the College / University, on recommendation of the P. G. Board of Studies in Chemistry .

OR

Theoretical question papers may be set and examined by both internal as well as external setters and examiners, as per recommendation of the P. G. Board of Studies.

(v).Question papers should be moderated by a Board of Moderators consisting of both Internal and External Members, recommended by the P. G. Board of Studies.

Practical Courses

6. (i). Practical part of a paper (25-30 marks) shall be composed of the following components (marks): Experimental (10-15) + Laboratory Records (05) + Viva-voce (05) + Internal Assessment (05).

(ii). Duration of laboratory session for a practical course of 25-30 marks shall be 90-120 hours and the duration of examination of such a practical course shall be 6 hours.

(iii). For the practical portion of each paper, the examination shall be conducted and scripts evaluated by at least two examiners, appointed from the teachers (including guest teachers) of the department, conducting the course and one external examiner, recommended by the P. G. Board of Studies.

(iv). There shall be no terminal examination for the computer application in chemistry courses, (CAC-1 and CAC-2), the entire marks (10) for each part shall be awarded by the concerned teacher(s) through continuous assessment.

(v). Lab. Quiz Test (25 marks) shall be held at the end of Semester-III. This shall be a one hour written examination, based on short answer type and or MCQ type questions (each of 1-2 marks), on the entire practical courses (Inorganic, Organic & Physical Chemistry practical courses and (CAC-1 & CAC-2) as included in Semesters-I, II & III. Marks distribution for this test shall be:

$$[(\text{Inorganic-06} + \text{Organic-06} + \text{Physical-06} + \text{CAC (1 \& 2) -07}) = 25]$$

(vi). Project work and Seminar [Paper-XII-(Group-B) Practical, Unit-1(20 marks)] to be carried out by the candidates individually in the 4th. Semester, may be composed of the following components: experimental / theoretical / review. The project report has to be submitted by the respective candidates (in triplicate) in the form of dissertations, which shall be partly evaluated by an external examiner (dissertation part-10 marks) and partly by a Board of Examiners consisting of External and Internal members (seminar part-10 marks) based on the presentation and defense of the same by the concerned candidate in a departmental seminar.

(vii). Grand Viva-Voce examination at the end of 4th. Semester [Paper-XII-(Group-B) Practical, Unit-2, (20 marks)] shall be conducted by a Board of Examiners consisting of External and Internal members.

Course Curricula

Semester-I

General Papers

Paper- I: CHEM(G)-11: Inorganic Chemistry General-1(80 Marks)

Group-A Theoretical : (50 Marks)		Group-B : Practical (30 Marks)	
Unit-1 (18M)	Symmetry & Bonding	Unit-1(15M)	Quantitative Inorg. Analysis
Unit-2 (16M)	Coordination Chemistry	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Inorganic Analysis	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- II: CHEM(G)-12: Organic Chemistry General-1(80 Marks)

Group-A Theoretical : (50 Marks)		Group-B : Practical (30 Marks)	
Unit-1 (18M)	Bonding in Organic Compounds	Unit-1(15M)	Qualitative Org. Analysis
Unit-2 (16M)	Stereochemistry Conformational Analysis	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Organic Reaction Mechanism(1)	Unit-3 (05M)	Lab. Records
		Unit-4 (05M)	Int. Assessment

Paper- III: CHEM(G)-13: Physical Chemistry General-1(90 Marks)

Group-A: Theoretical (50 Marks)		Group-B : Practical (40 Marks)	
Unit-1 (18M)	Thermodynamics	Unit-1(15M)	Phys. Chem. Experiments based on Analytical Methods
Unit-2 (16M)	Chemical Kinetics & Reaction Dynamics	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Atomic Structure	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment
		Unit-5(10M)	CAC-1

CAC: Computer Applications in Chemistry

Semester-II

General Papers

Paper- IV: CHEM(G)-21: Inorganic Chemistry General-2(80 Marks)

Group-A : Theoretical (50 Marks)		Group-B : Practical (30 Marks)	
Unit-1 (16M)	Chemistry of Elements (1) Special Features	Unit-1(15M)	Semi-Micro Qualitative Inorganic Analysis
Unit-2 (16M)	Chemistry of Elements (2) Comparative Aspects	Unit-2(05M)	Viva-voce
Unit-3 (18M)	Organometallic & Cluster Compounds: <i>Structure & Bonding</i>	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- V: CHEM(G)-22:Organic Chemistry General-2(80 Marks)

Group-A : Theoretical (50 Marks)		Group-B: Practical (30 Marks)	
Unit-1 (18M)	Organic Reaction Mechanism(2)	Unit-1(15M)	Organic Synthesis
Unit-2 (16M)	Percyclic Reactions	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Organic Synthesis	Unit-3 (05M)	Lab. Records
		Unit-4 (05M)	Int. Assessment

Paper- VI: CHEM(G)-33: Physical Chemistry General-2(90 Marks)

Group-A :Theoretical (50 Marks)		Group-B : Practical (40 Marks)	
Unit-1 (16M)	Quantum Mechanics	Unit-1(15M)	Phys. Chem. Expts. based on Instrumental methods
Unit-2 (18M)	Spectroscopy	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Electrochemistry	Unit-3(05M)	Lab. Rrecords
		Unit-4(05M)	Int. Assessment
		Unit-5(10M)	CAC-2

CAC : Computer Applications in Chemistry

Semester-III

Advanced General Papers

Paper-VII: CHEM(G)-31 (75 Marks)

Advanced General Chemistry-1

Group-A : Theoretical (50 Marks)

Unit-1 (18M)	Instrumental Methods in Chemistry(1)
Unit-2 (16M)	Instrumental Methods in Chemistry(2)
Unit-3 (16M)	Instrumental Methods in Chemistry(3)

Group-B: Practical (25 Marks)

Unit-1(10M)	Inorganic Synthesis
Unit-2(05M)	Viva-voce
Unit-3(05M)	Lab. Records
Unit-4(05M)	Int. Assessment

(1): UV-VIS, IR, NMR, MS, ORD, CD

(2): EPR, NQR, MB, Raman, PES

(3): X-Ray, Electron & Neutron Diffraction Methods

Paper- VIII: CHEM(G)-32 : (75 Marks)

Advanced General Chemistry- 2

Group-A : Theoretical (50 Marks)

Unit-1 (16M)	Techniques of Chemical Separation [#]
Unit-2 (16M)	Nuclear Chemistry & Radio Chem. Analysis
Unit-3 (18M)	Environmental Chem. & Env. Analysis

Group-B : Practical (25 Marks)

Unit-1(10M)	Quantitative Org. & Environmental Anal.
Unit-2(05M)	Viva-voce
Unit-3(05M)	Lab. Records
Unit-4(05M)	Int. Assessment

[#] Chromatography, HPLC, GC, Ion-Exchange, Solvent Extraction

Paper- IX : CHEM(G)-33: (100 Marks)

Biological Aspects of Chemistry

Group-A :Theoretical (50 Marks)

Unit-1 (18M)	Bioinorganic Chemistry
Unit-2 (16M)	Bioorganic Chemistry
Unit-3 (16M)	Biophysical Chemistry

Group-B :Practical (50 Marks)

Unit-1(10M)	Spectroscopic Studies on Model Compounds
Unit-2(05M)	Viva-voce
Unit-3 (05M)	Lab. Records
Unit-4(05M)	Int. Assessment
Unit-5 (25M)	Lab.Quiz Test

Lab.Qiz Test: [Inorg.-6 + Org.-6 + Phys.-6 + CAC(1 & 2) -7] Total = 25

Semester-IV

Special Papers

Inorganic Chemistry / Organic Chemistry / Physical Chemistry

Inorganic Chemistry Special

Paper- X: CHEM(IS)-41: (80 Marks) : Special Paper-1

Group-A: Special Theoretical-1 (50 Marks) <i>(Common with Physical Special)</i>		Group-B Special Practical (30 Marks) Analysis of Complex Materials	
Unit-1 (18M)	Chemical Application of Group Theory	Unit-1(15M)	Analysis of Complex Materials
Unit-2 (16M)	Advanced Spectroscopy	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Solid State & Structural Chemistry	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XI: CHEM(IS)-42: (80 Marks) : Special Paper-2

Group-A: Special Theoretical-2 (50 Marks)		Group-B Special Practical (30 Marks) Adv. Physicochemical Experiments <i>(Common with Physical Special)</i>	
Unit-1 (16M)	Complex Equilibria	Unit-1(15M)	Experiment
Unit-2 (16M)	Inorganic Reaction Mechanism	Unit-2(05M)	Viva-voce
Unit-3 (18M)	Organometallic Chemistry(2): Catalysis <i>(Common with Organic Special)</i>	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XII: CHEM(IS)-43 (90 Marks) : Special Paper-3

Group-A Special Theoretical-3 (50 Marks)		Group-B Special Practical (40 Marks)	
Unit-1 (16M)	Magneto chemistry	Unit-1(20M)	Project & Seminar
Unit-2 (18M)	Advanced Bioinorganic Chemistry	Unit-2 (20M)	Grand Viva-Voce
Unit-3 (16M)	Inorganic Materials		

Organic Chemistry Special

Paper- X: CHEM(OS)-41 (80 Marks): Special Paper-1

Group-A: Theoretical (50 Marks)		Group-B : Practical (30 Marks)	
Unit-1 (18M)	Advanced Spectroscopy <i>Applications to Organic Systems</i>	Unit-1(15M)	Multi Step Organic Synthesis
Unit-2 (16M)	Dynamic Aspects of Stereochemistry	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Photo Organic Chemistry & Free Radical Reactions	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XI: CHEM(OS)-42 (80 Marks): Special Paper-2

Group-A: Theoretical (50 Marks)		Group-B : Practical (30 Marks)	
Unit-1 (16M)	Advanced Organic Synthesis (1)	Unit-1(15M)	Isolation & Characterization
Unit-2 (16M)	Advanced Organic Synthesis (2)	Unit-2(05M)	Viva-voce
Unit-3 (18M)	Adv. Organometallic Chemistry : <i>Catalysis (Common with Inorganic Special)</i>	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XII: CHEM(OS)-43 :(90 Marks) : Special Paper-3

Group-A :Theoretical (50 Marks)		Group-B : Practical (40 Marks)	
Unit-1 (16M)	Heterocyclic Compounds	Unit-1(20M)	Project & Seminar
Unit-2 (16M)	Chemistry of Natural Products	Unit-2(20M)	Grand Viva-Voce
Unit-3 (18M)	Supra molecular Chemistry & Medicinal Chemistry		

Paper- X: CHEM(PS)-41 (80 Marks) : Special Paper-1

Group-A: Theoretical (50 Marks)

Group-B : Practical (30 Marks)

(Common with Inorganic Special)

Unit-1 (18M)	Chemical Applications of Group Theory	Unit-1(15M)	Adv. Physical Chemistry Experiments
Unit-2 (16M)	Advanced Spectroscopy	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Solid State & Structural Chemistry	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XI: CHEM(PS)-42: (80 Marks) : Special Paper-2

Group-A: Theoretical (50 Marks)

Group-B : Practical (30 Marks)

Adv. Physicochemical Experiments

(Common with Inorganic Special)

Unit-1 (18M)	Statistical Mechanics(1)	Unit-1(15M)	Experiment
Unit-2 (16M)	Statistical Mechanics (1)	Unit-2(05M)	Viva-voce
Unit-3 (16M)	Surface Chemistry & Dielectric Properties	Unit-3(05M)	Lab. Records
		Unit-4(05M)	Int. Assessment

Paper- XII: CHEM(PS)-43 :(90 Marks) : Special Paper-3

Group-A :Theoretical (50 Marks)

Group-B : Practical (40 Marks)

Unit-1 (18M)	Advanced Quantum Mechanics	Unit-1(20M)	Project & Seminar
Unit-2 (16M)	Applications of Quantum Mechanics	Unit-2(20M)	Grand Viva-Voce
Unit-3 (16M)	Polymers & Macromolecules		

Eligibility

7. A candidate who has passed the B. Sc. Honours examination in Chemistry with Physics and Mathematics as his/her elective subjects and secured the minimum

percentage of marks as stipulated by the University / College from time to time, is eligible for applying for admission in to the two-year four-semester M. Sc. Course in Chemistry.

8. Any candidate who has passed the B. Sc. Honours examination in Chemistry not less than one academic year previous to the year of the M. Sc. Semester-I examination in Chemistry may appear at the said examination, provided that he/she has passed the B. Sc. Honours examination in Chemistry (vide Regulation No. 7) from this University or any other University / Institute recognized by the UGC and has completed the Semester-I course in Chemistry in this University/ College or in a College / Colleges affiliated to this University in respect of the subject Chemistry.

9. A candidate will be eligible to appear in a semester examinations provided he/she has attended at least 65% of the lectures delivered and lab. sessions conducted in that particular semester, separately in the theoretical and practical components of all the papers stipulated for that semester, after his / her admission to the course.

10. All candidates who have secured the required percentage of attendance as defined in Regulation-9 shall be called **regular candidates**.

Evaluation

11.(a). A 6 (six) point grade system shall be followed for the purpose, details of which are laid down hereunder:

Percent Marks	Grade	Numerical Grade Point	Remarks
75-100	O	7.50-10.00	Outstanding
65-74	A ⁺	6.50-7.49	Good
60-64	A	6.00-6.49	Fair
55-59	B	5.50-5.99	Satisfactory
40-54	C	4.00-5.49	Average
35-39	D	3.50-3.99	Poor
0-34	F	0.00-3.49	Fail

(b).The following multiplication table shall be used for calculation of the exact grade points:

Marks Between (excluding the end points)	Multiplication Factors
75-100	0.1
65-74	0.1
60-64	0.1
55-59	0.1
40-54	0.1
35-39	0.1
0-34	0.1

(c). Award of Grades

Example-1: If a candidate secures 63% marks in a particular paper, his/her grade point for the paper will be: $(6.00 + 0.1 \times 3) = 6.3$

Example-2: If a candidate scores 64% in theory and 68% in practical in a 8-credit course (Theoretical- 5 credits + Practical -3 credits = Total 8-credits), then his/her grade point for the course will be as follows:

$$\text{Grade Point} = \frac{[5 \times (6.0 + 0.1 \times 4) + 3 \times (6.5 + 0.1 \times 3)]}{(5 + 3)} = 6.55$$

Example-3: If a candidate scores 68% in theory and 64% in practical in a 8-credit course (Theoretical- 5 credits + Practical -3 credits = Total 8-credits), then his/her grade point for the course will be as follows:

$$\text{Grade Point} = \frac{[5 \times (6.5 + 0.1 \times 3) + 3 \times (6.0 + 0.1 \times 4)]}{(5 + 3)} = 6.65$$

(i).The Semester Grade Point Average (SGPA) will be just the average of the grade points obtained in all the papers (Group-A and Group-B of a paper taken

separately) of a particular semester. If the numerical grade points obtained by a candidate are denoted by C_i (here, $i = 1$ to 3 , as there are 3 papers in each semester), the SGPA will simply be equal to $\Sigma C_i / 3$ usually, as all the papers are of equitable weightage.

(ii).Cumulative Grade Point Average (CGPA) over four semesters shall be calculated by working out simple average of the SGPA for individual semesters.

(iii).On the basis of CGPA obtained by a candidate over four semesters, Grade and Class will be awarded as follows:

CGPA	Grade	Remarks	Class /Division
7.50-10.00	O	Outstanding	I (First Class)
6.50-7.49	A ⁺	Good	I (First Class)
6.00-6.49	A	Fair	I (First Class)
5.50-5.99	B	Satisfactory	II (Second Class)
5.00-5.49	C	Average	II (Second Class)
4.00-4.99	D	Poor	II (Second Class)
0.00-3.99	F	Fail	X (Fail)

(iv).Both SGPA and CGPA shall be rounded off to the second place of decimal and the rounded off value will be shown as such on the mark sheet.

(v).The mark sheet issued at the end of each semester shall include both the Grade point Average (GPA) and the total marks obtained in each paper, as well as SGPA and the total marks obtained in that semester. The final mark sheet for the 4th. Semester shall also include the CGPA and the total marks obtained out of 1000 along with Grade and Class.

12. (a). If a candidate gets F in one or more paper(s), he/she shall be deemed to have failed in that / those paper(s) only and he /she shall be required to appear at the subsequent examination for that paper / those papers in a subsequent semester examination.

(b).A candidate failing to score 40% marks in the aggregate in a semester examination shall appear at the subsequent examination in all the papers of that semester. He/she will, however, be permitted to proceed and continue with the next semester.

(c). A candidate can appear a maximum number of two times (excluding, but *immediately after*, his/her regular appearance) to clear a particular paper or to clear a particular semester (for those who fail in aggregate), failing which he/she shall be dropped from the Rolls of the College / University.

(d).A candidate failing in all the courses (papers) in a semester examination shall have to repeat the entire semester examination.

13. If a student is dropped from the Rolls of the College / University, for failing to clear a particular paper/ papers, he /she may apply for readmission at the beginning of the next academic session along with the fresh applicants, according to the provisions to be laid down by the College/ University from time to time.

14. A candidate must secure 35% or more marks (that is, not less than 35% marks) in each of the papers to pass the examination; however, he/she must obtain at least 40% in the aggregate to qualify for each semester and the final degree. Candidates scoring 40% or more but below 60% marks in the aggregate, shall be declared to have passed the examination and have been placed in the second class. Those scoring 60% or more marks in the aggregate, shall be declared to have passed the examination and have been placed in the first class. Class secured by a candidate shall be shown in the final mark sheet of 4th. semester examination.

15. If a candidate gets F grade in one or more papers in a semester examination, his / her SGPA for that semester shall be temporarily withheld and Grade Point Withheld (GPW) shall be marked in place of SGPA on his/her mark sheet. Fresh mark sheet with duly calculated CGPA shall be issued to him/her when the candidate (grade D or above) clears the paper/ papers subsequently within the stipulated time frame.

16. If a candidate has one or more back papers (including those who fail in aggregate) in any semester, then his/her CGPA shall remain incomplete (INC) till he/ she clears all those back papers. The CGPA of such a candidate shall be marked "INC" on the mark sheet. Fresh mark sheet with duly calculated CGPA shall be issued only after he/she clears all those back papers subsequently within the stipulated time frame.

17. To be eligible for the award of ranks in order of merit, a candidate must pass all the four semester examinations at the first chance (as a regular candidate). The final merit list shall be prepared on the basis of CGPA (including all the four semesters) provided, however, that the candidates taking examination of back papers shall be excluded from such merit list.

18. Separate mark sheets in prescribed formats given below shall be issued to the candidates for Semester-I, Semester-II, Semester-III and Semester-IV examinations.

West Bengal State University

M. Sc. First Semester Examination-2009

The following is the statement of marks obtained by(*Name of the candidate*).....,
 Roll: SCCH/CHEM/SEM-1/No.2009-00XX Registration No.of 2009 – 2010, appearing from
Sree Chaitanya College, Habra, at the M. Sc. First Semester Examination-2009 (held in January, 2010).

Paper (Course ID)	Course Curricula(G)	Marks obtained			GPA	SGPA	Grade Remarks
		Theo.	Pr.	Credit			
Paper-I CHEM(G)-11	Inorganic Chemistry (Group-A):Theoretical (F..M.50) Unit-1:Symmetry & Bonding Unit-2: Coordination Chemistry Unit-3: Inorganic Analysis (Group-B):Practical (F. M. 30) Quantitative Inorganic Analysis based on Spectrophotometry, Ion-exchange & Complexometry						
Paper-II CHEM(G)-12	Organic Chemistry (Group-A):Theoretical (F. M.50) Unit-1: Bonding in org.compds. Unit-2: Org. Reaction Mech.(1) Unit-3:Stereochem. & Conf. Anal. (Group-B):Practical (F.M.30) Qualitative organic analysis						
Paper-III CHEM(G)-13	Physical Chemistry (Group-A):Theoretical(F.M.50) Unit-1: Thermodynamics Unit-2: Chem. Kinetics Unit-3: Atomic Structure (Group-B):Practical (F. M.40) Physical Chemistry Experiments Based on Analytical Methods & Computer Applications in Chemistry(1)						

GPA: Grade Point Average, SGPA: Semester Grade Point Average, GPW: Grade point Withheld, INC: Incomplete
 G: General Papers, * Minimum marks to be obtained: 35% in each course and 40% in aggregate.

SGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	Good	Fair	Satisfactory	Average	Poor	Fail

Monogram of College

Principal

Controller of Examination

West Bengal State University

M. Sc. Second Semester Examination-2010

The following is the statement of marks obtained by (*Name of the candidate*)... ..,
 Roll: SCCH/CHEM/SEM-1/No.2010-00XX Registration No.of 2010 – 2011, appearing from
Sree Chaitanya College, Habra, at the M. Sc. Second Semester Examination-2010 (held in June, 2010).

Paper (Course ID)	Course Curricula(G)	Marks obtained			GPA	SGPA	Grade Remarks
		Theo.	Pr.	Credit			
Paper-IV CHEM(G)-21	Inorganic Chemistry (Group-A):Theoretical (F.M.50) Unit-1: Chemistry of Elements(1) Unit-2: Chemistry of Elements(2) Unit-3:Organomet. & Cluster (Group-B):Practical (F. M. 30) Semi-Micro Qualitative Inorganic Analysis						
Paper-V CHEM(G)-22	Organic Chemistry (Group-A):Theoretical (F.M.50) Unit-1: Org. Reaction Mech.(2) Unit-2: Pericyclic Reactions Unit-3: Organic Synthesis Practical (Full Marks-30) Organic Synthesis						
Paper-VI CHEM(G)-23	Physical Chemistry (Group-A):Theoretical (F.M.50) Unit-1: Quantum Mechanics Unit-2: Spectroscopy Unit-3: Electrochemistry (Group-B):Practical (F. M.40) Physical Chemistry Experiments based on Instrumental Methods & Computer Applications in Chemistry(2)						

GPA: Grade Point Average, SGPA: Semester Grade Point Average, GPW: Grade point Withheld, INC: Incomplete

G: General Papers, * Minimum marks to be obtained: 35% in each course and 40% in aggregate.

Grade Point	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	Good	Fair	Satisfactory	Average	Poor	Fail

Monogram of College

Principal

Controller of Examination

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West Bengal State University

M. Sc. Third Semester Examination-2010

The following is the statement of marks obtained by (name of the candidate),
Roll: SCCH/CHEM/SEM-III/No.2010-00XX Registration No.of 2009 – 2010, appearing from
Sree Chaitanya College, Habra, at the M. Sc. Third Semester Examination-2010 (held in January, 2011).

Paper (Course ID)	Course Curricula(G)	Marks obtained			GPA	SGPA	Grade Remarks
		Theo.	Pr.	Credit			
Paper-VII CHEM(G)-31	Advanced General Chemistry (1) (Group-A):Theoretical (F.M.50) Unit-1: Instrumental Methods (1) Unit-2: Instrumental Methods (2) Unit-3: Instrumental Methods (3) (Group-B):Practical (F. M. 25) Inorganic Synthesis						
Paper-VIII CHEM(G)-32	Advanced General Chemistry (2) (Group-A):Theoretical (F.M.50) Unit-1: Techs. of Chem. Sepn. Unit-2: Nuclear & Radio Chem. Unit-3; Env. Chem. & Env. Anal. (Group-B):Practical (F. M. 25) Quantitative Org. & Env. Anal.						
Paper-IX CHEM(G)-33	Biological Aspects of Chemistry (Group-A):Theoretical (F.M.50) Unit-1: Bioinorganic Chemistry Unit-2: Bioorganic Chemistry Unit-3: Biophysical Chemistry (Group-B):Practical (F. M.50) (a).Spectroscopic Studies on Model Compounds(F.M.25) (b).Lab. Quiz Test : (F. M. 25)						
GPA: Grade Point Average, SGPA: Semester Grade Point Average, GPW: Grade point Withheld, INC: Incomplete G: General Papers, * Minimum marks to be obtained: 35% in each course and 40% in aggregate.							
SGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	Good	Fair	Satisfactory	Average	Poor	Fail

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West Bengal State University

M. Sc. Fourth Semester Examination-2011

The following is the statement of marks obtained by (name of the candidate)... .. ,
Roll: SCCH/CHEM/SEM-1V/No.2011-00XX Registration No.of 2009 – 2010, appearing from
Sree Chaitanya College, Habra, at the M. Sc. Fourth Semester Examination-2011 (held in June, 2011).

Paper (Course ID)	Course Curricula(S)	Marks obtained			GPA	SGPA	CGPA	Grade Remarks (Class)
		Th.	Pr.	Credit				
Paper-X CHEM(IS)-41	Inorganic Chemistry Special-1 (Group-A):Theoretical (F.M.50) Unit-1:Adv. Spectroscopy(1) Unit-2: Group Theory Unit-3: Solid St.& Struct. Chem.							
	(Group-B):Practical (F. M. 30) Analysis of Complex Materials							
	Inorganic Chemistry Special-2 (Group-A):Theoretical (F.M.50) Unit-1: Complex Equilibria Unit-2:Inorg. Reactn. Mech. Unit-3: Adv. Organometallics							
Paper-XI CHEM(IS)-42	(Group-B):Practical (F. M. 30) Adv. Physicochemical Expts.							
	Inorganic Chemistry Special-3 (Group-A):Theoretical (F.M.50) Unit-1: Magnetochemistry Unit-2: Adv. Bioinorg. Chem. Unit-3: Inorganic Materials							
	(Group-B):Practical (F. M.40) Project & Seminar (20) Grand Viva-Voce (20)							
Paper-XII CHEM(IS)-43								

Semester-I..... Semester-II.....
Semester-III..... Semester-IV

GPA: Grade Point Average, SGPA: Semester Grade Point Average, CGPA: Cumulative Grade point Average,
GPW: Grade point Withheld, , INC: Incomplete, S: Special Papers (IS: Inorganic Special, OS: Organic Special, PS: Physical Special).
* Minimum marks to be obtained: 35% in each course and 40% in aggregate.

SGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	God	Fair	Satisfactory	Average	Poor	Fail
CGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	0.00-3.99	
Grade	O	A ⁺	A	B	C	F	
Remarks (Class)	Outstanding (I)	Good (I)	Fair (I)	Satisfactory (II)	Average (II)	Fail (X)	

Monogram of College

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Controller of Examination

West Bengal State University**M. Sc. Fourth Semester Examination-2011**

The following is the statement of marks obtained by (name of the candidate)... .. ,
Roll: SCCH/CHEM/SEM-1V/No.2011-00XX Registration No.of 2009 – 2010, appearing from
Sree Chaitanya College, Habra, at the M. Sc. Fourth Semester Examination-2011 (held in June, 2011).

Paper (Course ID)	Course Curricula(S)	Marks obtained			GPA	SGPA	CGPA	Grade Remarks (Class)
		Th.	Pr.	Credit				
Paper-X CHEM(S)-41(OS)	Organic Chemistry Special-1 (Group-A):Theoretical (F.M.50) Unit-1:Adv. Spectroscopy Unit-2:Dynamic Aspects of Stereochemistry Unit-3: Photoorg & Free Radical (Group-B):Practical (F. M. 30) Multi Step Organic Synthesis							
Paper-XI CHEM(S)-42(OS)	Organic Chemistry Special-2 (Group-A):Theoretical (F.M.50) Unit-1: Adv. Org. Synthesis(1) Unit-2: Adv. Org. Synthesis(2) Unit-3: Adv. Organometallics (Group-B):Practical (F. M. 30) Isolation & Characterization of Organic Compounds							
Paper-XII CHEM(S)-43(OS)	Organic Chemistry Special-3 (Group-A):Theoretical (F.M.50) Unit-1: Heterocyclic Compds. Unit-2: Chem. of Natl. Products Unit-3: Supramol.& Med. Chem. (Group-B):Practical (F. M.40) Project & Seminar (20) Grand Viva-Voce (20)							

Semester-I..... Semester-II.....
Semester-III..... Semester-IV

GPA: Grade Point Average, SGPA: Semester Grade Point Average, CGPA: Cumulative Grade point Average,
GPW: Grade point Withheld, , INC: Incomplete, S: Special Papers (IS: Inorganic Special, OS: Organic Special, PS: Physical Special). *

SGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	God	Fair	Satisfactory	Average	Poor	Fail
CGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	0.00-3.99	
Grade	O	A ⁺	A	B	C	F	
Remarks (Class)	Outstanding (I)	Good (I)	Fair (I)	Satisfactory (II)	Average (II)	Fail (X)	

Monogram of College

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Controller of Examination

West Bengal State University**M. Sc. Fourth Semester Examination-2011**

The following is the statement of marks obtained by (name of the candidate)... .. ,
Roll: SCCH/CHEM/SEM-1V/No.2011-00XX Registration No.of 2009 – 2010, appearing from
Sree Chaitanya College, Habra, at the M. Sc. Fourth Semester Examination-2011 (held in June, 2011).

Paper (Course ID)	Course Curricula(S)	Marks obtained		Credit	GPA	SGPA	CGPA	Grade Remarks (Class)
		Th..	Pr.					
Paper-X CHEM(PS)-41	Physical Chemistry Special-1 (Group-A):Theoretical (F.M.50) Unit-1: Group Theory Unit-2: Adv. Spectroscopy Unit-3: Solid St.& Struct. Chem. (Group-B):Practical (F. M. 30) Adv. Physical Chem. Expts.							
	Physical Chemistry Special-2 (Group-A):Theoretical (F.M.50) Unit-1: Statistical mechanics(1) Unit-2: Statistical mechanics(2) Unit-3: Surf. Chem. & Dielectric (Group-B):Practical (F. M. 30) Adv. Physicochemical Expts.					Semester-I.....	Semester-II.....	
Paper-XI CHEM(PS)-42	Physical Chemistry Special-3 (Group-A):Theoretical (F.M.50) Unit-1: Adv. Quantum. Mechs. Unit-2: Appl. of Quantum Mech Unit-3: Polymer & Macromoles. (Group-B):Practical (F. M.40) Project & Seminar (20) Grand Viva-Voce (20)					Semester-III.....	Semester-IV.....	

GPA: Grade Point Average, SGPA: Semester Grade Point Average, CGPA: Cumulative Grade point Average,
GPW: Grade point Withheld, , INC: Incomplete, S: Special Papers (IS: Inorganic Special, OS: Organic Special, PS: Physical Special).
* Minimum marks to be obtained: 35% in each course and 40% in aggregate.

SGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.49	3.50-3.99	0.00-3.49
Grade	O	A ⁺	A	B	C	D	F
Remarks	Outstanding	God	Fair	Satisfactory	Average	Poor	Fail
CGPA	7.50-10.00	6.50-7.49	6.00-6.49	5.50-5.99	4.00-5.59	0.00-3.99	
Grade	O	A ⁺	A	B	C	F	
Remarks (Class)	Outstanding (I)	Good (I)	Fair (I)	Satisfactory (II)	Average (II)	Fail (X)	

Monogram of College

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Controller of Examination

19. Successful candidates at the final semester examination shall be awarded a certificate in the format as stated hereunder.

**University
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West Bengal State University

This is to certify that (Name of the candidate) has obtained the Degree of Master of Science in Chemistry of this University in 20..... in Semester Examination System, and that he/she has been placed in the ...(Class obtained)..... Class, attaining Grade... (Grade obtained).....

Vice Chancellor

Prize & Award

20. (a). A candidate who is placed first in the first class in Chemistry (comprising Inorganic, Organic and Physical Chemistry special branches) shall be awarded with a prize of books to the value of Rupees (to be determined by the College / University from time to time) and the candidate who is placed second in the first class in Chemistry (comprising Inorganic , Organic and Physical Chemistry special branches) shall be awarded with a prize of books to the value of Rupees (to be determined by the College / University from time to time, but less than the value awarded to the first class first).

(b). The candidates who obtain the highest marks in each group comprised in the subject Chemistry (viz., Inorganic, Organic and Physical Chemistry special branches) and have been placed in the first class shall be awarded with prize of books to the value of Rupees (to be determined by the College / University from time to time, but less than the value awarded to the first class first and equal to the value awarded to the first class second).