
MARKING SCHEME

2007

CLASS-XII
SCIENCE SUBJECTS



CENTRAL BOARD OF SECONDARY EDUCATION
DELHI

MARKING SCHEME

2007

CLASS-XII SCIENCE SUBJECTS



**CENTRAL BOARD OF SECONDARY EDUCATION
DELHI**

CBSE, Delhi-110301

November, 2007

Manuscript as such highlights the main value points and does not represent a complete ideal answer.
Manuscript may vary from time to time and year to year.

Published by Shri Vineet Joshi, Secretary, C.B.S.E. 'Shiksha Kendra', 2, Community Centre,
Preet Vihar, Delhi - 110301. Laser typesetting and Printed by Akashdeep Printers, Daryaganj,
New Delhi - 110002

PREFACE

CBSE as a pace setting national Board has constantly been striving to design its evaluation process in a manner that it is used as a powerful means of influencing the quality of teaching and learning in the classroom situation. Also, it has to be so designed that it provides constant feedback regarding the effectiveness of the course content, classroom processes and the growth of individual learners besides the appropriateness of evaluation procedures.

As a move in this direction, CBSE started the practice of publishing the Marking Schemes with twin objectives in mind-(i) making the system more transparent and at the same time, (ii) ensuring high degree of reliability in scoring procedure.

Who are the makers of answer scripts? How do they mark the answer scripts? How can it be ensured that marking is fair, objective and reliable? Questions of these types naturally arise in the minds of candidates appearing in the public examination. These questions are equally pertinent to the teachers who are not adequately exposed to the CBSE system of marking.

Answer Scripts marking is a specialised job. It is assigned to teachers-PGTs for Class XII and TGTs for Class X who are in direct touch with the subject and have a minimum of 3 years experience of teaching the subject at that level. Appointment of examiners is made in accordance with the well-defined norms. Markers examine scripts with the help of detailed guidelines called the 'Marking Schemes'.

It is this tool (Marking Scheme) alongwith the extensive supervisory checks and counter-checks through which CBSE tries to ensure objective and fair marking. The present publication is being brought out with a view to serving the following objectives :

- (i) To give an opportunity to the teachers and students to look into the Marking Schemes that were developed by the Board and supplied to the evaluators in 2007 main examination in some selected main subjects.
- (ii) To receive feedback and suggestions from institutions/subject teachers on the utility and further improvement of Marking Schemes.
- (iii) To encourage institutions to undertake similar exercise of developing marking schemes for classes other than those covered by the Board's examination with a view to increasing teachers' responsiveness to them as the essential tools of evaluation.

HOW TO USE

Teachers and the students preparing for Class XII examination of the Board constitute the primary interest-group of this publication. Marking Schemes of Question Papers in the subjects of English Core, Functional English, Mathematics, Physics, Chemistry, Biology, Bio-technology, Informatics Practices, Computer Science and Engineering Drawing administered in Delhi and Outside Delhi during the 2007 main examination have been included in this document. Some tips on their usage are given below :

(a) To Teachers :

- Go through the syllabus and the weightage distribution for the subject carefully.
- Read the question paper to find out how far the question paper set subscribes to the prescribed design. Grade every question by difficulty level for students who have taken the main Board examination.
- Consult the 'Marking Scheme' for each question, with reference to steps into which answers and awards have been divided.
- Work out concrete suggestions for the Board.

(b) To Students :

- Study each question carefully, comprehend them and write down the main points of the answer and note down their difficulties for clarification.
- Examine a question in conjunction with the Marking Scheme and find out the proximity of the answer to that suggested in the Marking Scheme.

We will feel motivated if this publication is commented upon by practitioners in the context of its impact on their teaching learning strategies. Contribution of the experts and the officials of the Board in bringing out this document is gratefully acknowledged.

We urge the teachers to encourage their students to make use of this publication and at the same time to enrich us with their free and frank reactions.

M.C. SHARMA
CONTROLLER OF EXAMINATIONS

CONTENTS

Senior School Certificate Examination (XII)

Marking Scheme

	Page No.
1. English Core	1–32
2. Functional English	33–74
3. Mathematics	75–118
4. Physics	119–161
5. Chemistry	162–184
6. Biology	185–208
7. Bio-technology	209–222
8. Informatics Practices	223–260
9. Computer Science	261–311
10. Engineering Drawing	312–331

**LIST OF COORDINATORS/SUBJECT EXPERTS/REPRESENTATIVES
OF THE REGIONS FOR UPDATION/FINALISATION OF THE
MARKING SCHEME FOR THE SENIOR SCHOOL
CERTIFICATE EXAMINATION, 2007**

<i>S.No. Name of the Coordinator/Subject Experts</i>	<i>S.No. Name of the Coordinator/Subject Experts</i>
ENGLISH CORE	
1. Mrs. Usha Ram Principal Laxman Public School Hauz Khas New Delhi	6. Mrs. Rachna Pant Principal Summer Field School Kailash Colony, New Delhi
2. Sh. J.K. Gangal H- 196, Rama Krishna Vihar Patparganj Society Delhi	7. Smt. Kiran Khanna Principal Vivekanand School D- Block, Anand Vihar Delhi
3. Dr. Opkar Singh Retd. Prof. 121, Sahyog Appartments Mayur Vihar Phase-I Delhi	8. Mrs. S. Chatterjee Principal Ajmera Mukesh Nemichand Bhai Shri Gujarati Samaj School A.B. Road, Indore Madhya Pradesh
4. Ms. Lata Mathew Principal Hamdard Public School Talima Bagh, Sangam Vihar New Delhi	9. Smt. J. Dasbasu Principal Kendriya Vidyalaya Digaru P.O. Sonapur, Distt. Kamrup Assam
5. Smt. Vandana Kapoor Principal S.L.S. DAV Public School Mausam Vihar Delhi	10. Mrs. Prem Dulari Principal The Hindu Senior Secondary School Triplicane, Chennai Tamil Nadu

S.No. Name of the Coordinator/Subject Experts

11. Mrs. Ravi Raj Kaur
PGT
Govt. Model Senior Secondary School
Sec. 35, Chandigarh
12. Mrs. Neena Sehgel
Principal
Delhi Public School
Sector 30, Noida
Gautam Budh Nagar
13. Sh. D.N. Tewari
Laxman Public School
Hauz Khas
New Delhi
14. Ms. Bela Bhatya
GD Goenka School
Vasant Kunj
New Delhi
15. Mr. Nairn Sharma
Laxman Public School
Hauz Khas
New Delhi

FUNCTIONAL ENGLISH

1. Mrs. Annie Koshy
Principal
St. Mary's School
B-II Block Safdarjung Enclave
New Delhi
2. Mrs. Usha Ram
Principal
Laxman Public School
Hauz Khas, New Delhi

S.No. Name of the Coordinator/Subject Experts

3. Shri P.J. Peter
PGT
Laxman Public School
Hauz Khas
New Delhi
4. Mrs. Malini Khatri
Modern School
Barakhamba Road
New Delhi
5. Mrs. Neena Kaul
St. Mary's School
B-II Block, Saftarjung Enclave
New Delhi
6. Mrs. Rita Kapoor
Principal
Delhi Public School
Ghaziabad
Uttar Pradesh
7. Mrs. Kamala Subramanian
PGT, English
Ramjas Public School
R.K. Puram
New Delhi

MATHEMATICS

1. Mrs. Kusum Ahluwalia
Principal
Hans Raj Public School
Punjabi Bagh
New Delhi

S.No. Name of the Coordinator/Subject Experts

2. Sh. G.D. Dhall
K-171, LIC Colony
Syed Nangloi Village
Delhi
3. Sh. S.N. Chibber
Principal (Retd.)
B-330 Saraswati Vihar
Delhi
4. Sh. V.P. Singh
Principal
Govt. Boys Senior Secondary School
Kanti Nagar
Delhi
5. Sh. J.C. Nijhawan
Vice Principal
Govt. Sarvodaya Vidyalaya
C-Block, Saraswati Vihar,
Delhi
6. Sh. S. Vijay Kumar
Vice Principal
Jawahar Lal Nehru School
Habibganj, Bhopal
Madhya Pradesh
7. Mr. C. Sathyamurthy
Principal
Chinmaya Vidyalaya
Taylore Road, Kilpauk
Chennai
Tamil Nadu
8. Shri Yash Pal Sharma
Govt. Model Senior Secondary School
Sector-19, Chandigarh

S.No. Name of the Coordinator/Subject Experts

9. Dr. Ram Mohan
Principal
St. Vivekanand Public School
Alampur Hauz
Agra Road, Etawah
Uttar Pradesh
10. Mrs. Sandhya Arora
230, Pragati Appartment
Paschim Vihar
Delhi
11. Mrs. Sangita Chopra
PGT
Delhi Public School
Rohini
Delhi

PHYSICS

1. Sh. Suraj Prakash
Principal
CRPF Public School
Sec. XIV, Rohini
Delhi
2. Sh. P.N. Seth
65/42, New Rohtak Road
New Delhi
3. Sh. N.K. Sehgal
A-94/1, SFS Flats Saket
New Delhi
4. Sh. G. Giri
Head Master
Modern School
Barakhamba Road
New Delhi

<i>S.No. Name of the Coordinator/Subject Experts</i>	<i>S.No. Name of the Coordinator/Subject Experts</i>
5. Shri M.D. Gupta Principal Sanatan Dharam Public School Road No. 10, East Punjabi Bagh New Delhi	11. Shri S.K. Trivedi Principal Kendriya Vidyalaya Vikas Khand-I, Gomti Nagar Lucknow Uttar Pradesh
6. Shri P.N. Varshney Retd. Principal E-22/D, MIG Flats, Mayapuri New Delhi	12. Shri Surjan Singh CRPF Public School Sector XIV, Rohini Delhi
7. Shri Yogesh Bhatnagar St Xavier Sr. Sec. School Jaipur Rajasthan	CHEMISTRY
8. Shri Sanjeev Bansal Ahlcon Public School Mayur Vihar Phase I Delhi	1. Shri S.K. Munjal Principal St. Margret Public School D-Block Prashant Vihar Delhi
9. Mr. P. Neelakanta Pillai Principal Kola Perumal Chetty Vaishnav Sr. Sec. School 815, EVR Periyar High Road Arumbakkam Chennai	2. Dr. K.N. Uppadhya 326 SFS Flats Ashok Vihar Phase-IV Delhi
10. Shri O.P. Sachdeva Kendriya Vidyalaya No. 2 3 BRD Chandigarh	3. Dr.(Mrs.) Sangeeta Bhatia Principal New State Academy Sr. Sec. School Pitampura, Near Club Delhi
	4. Shri B.N. Mehrota A-32, Nanda Road Adarsh Nagar Delhi

<i>S.No. Name of the Coordinator/Subject Experts</i>	<i>S.No. Name of the Coordinator/Subject Experts</i>
5. Mrs. V.K. Sawhaney Principal Guru Harkrishan Public School Nanak Piou Ranapartap Bagh Delhi	10. Dr. D.R. Singh Principal DAV Jawahar Vidya Mandir H.S.L Colony, Shyamli Ranchi Jharkhand
6. Shri N.P. Dhaka Principal Dr. Rajendra Prasad Government Sarvodaya Vidyalaya President's Estate New Delhi	11. Shri Rakesh Dhawan PGT St. Margaret Public School D-Block, Prashant Vihar Delhi
7. Shri U.K. Jha Principal Maheshwari Public School Vaishali Nagar Ajmer Rajasthan	12. Prof. R.D. Shukla 40, Delux Apptt. B-5, Vasundhara Enclave Delhi
8. Sh. Damodar Reddy Principal Jawahar Navodaya Vidyalaya HCU Campus Gachilowli Hyderabad Andhra Pradesh	BIOLOGY
9. Dr. Swaran Lata PGT Chemistry Dayal Singh Public School Sector-7, Karnal Haryana	1. Shri Vinay Kumar Principal Delhi Public School Sector C Pocket5, Vasant Kunj New Delhi
	2. Shri Y.P. Purang Retd. Additional Director if Education C2/113 Janakpuri New Delhi
	3. Mrs. Rita Talwar Principal Cambridge School Srinivaspuri Lajpat Nagar New Delhi

<i>S.No. Name of the Coordinator/Subject Experts</i>	<i>S.No. Name of the Coordinator/Subject Experts</i>
4. Shri Sheo Raj Singh Principal Government Boys Sr. Sec. School S.P. Road, Nangloi Delhi	10. Smt. Annie Therion Kendriya Vidyalaya Zirakpur Mohali Punjab
5. Smt. Neeta Rastogi Principal Sadhu Vaswani International School for Girls 2nd Street, Shanti Niketan New Delhi	11. Shri R.K. Sinha Principal Kendriya Vidyalaya Birjhar P.O. Azara Guwahati Assam
6. Shri P.V. Sairanga Rao Principal Kendriya Vidyalaya MEG Centre St. John's Road Bangalore Karnataka	12. Ms. Amita Chaturvedi HOD Jaipur
7. Mrs. Helen Harrison Principal Somerville School Block-H, Sector Alpha-II Greater Noida Distt. Gautam Budh Nagar Uttar Pradesh	13. Ms. Bandana R.P. Lazarys Delhi Public School Vasant Kunj New Delhi
8. Shri Virendra Srivastava B-3B/95 B Janakpuri New Delhi	14. Mrs. Shivani Goswami 563 Golf Vista Apartment Alpha 2 Sector, Greater Noida Gautam Budh Nagar Uttar Pradesh
9. Mrs. Rachna Gupta Delhi Public School Vasant Kunj New Delhi	
	BIO-TECHNOLOGY
	1. Dr. Ashwani Pareek 401, School of Life Science J.N.U. New Delhi

<i>S.No. Name of the Coordinator/Subject Experts</i>	<i>S.No. Name of the Coordinator/Subject Experts</i>
2. Dr. K. Nirmala Reader Deptt. of Bio-Chemistry Daulat Ram College University of Delhi Delhi	2. Shri M.P.S. Bhatia NSIT, Dwarka Delhi B-2/7C, Lawrence Road New Delhi
3. Dr. M.V. Rajam Reader in Genetics University of Delhi South Benito Juarej Road Dhaura Kuan New Delhi	3. Shri Gautam Sarkar Modern School Barakhamba Road New Delhi
4. Smt. Madhumati Bhaskarwar PGT G.D. Goneka Public School Sector 3, Pocket-8 & 9 Vasant Kunj New Delhi	4. Shri R.K. Tiwari PGT Vivekanand School D Block, Anand Vihar Delhi
5. Dr. Suveena Gangwani PGT Laxman Public School Hauz Khas New Delhi	5. Ms. Premlatha Shaji PGT Cochin Refineries School Ambalamukal P.O. Ernakulam Kerala
INFORMATICS PRACTICES	6. Mrs. Nancy Sehgal PGT Mat Jai Kaur Public School Ashok Vihar New Delhi
1. Shri Mukesh Kumar PGT Delhi Public School Sec-XII, R.K. Puram New Delhi	7. Mrs. Manjeet Jauhar PGT Vivek High School Sector-38, Chandigarh

***S.No. Name of the Coordinator/Subject
Experts***

8. Ms. Suji Gopalan
Delhi Public School
Sector-12, R.K. Puram
New Delhi

COMPUTER SCIENCE

1. Shri Mukesh Kumar
PGT
Delhi Public School
Sec-XII, R.K. Puram
New Delhi
2. Shri M.P.S. Bhatia
NSIT, Dwarka Delhi
B-2/7C, Lawrence Road
New Delhi
3. Shri Gautam Sarkar
PGT
Modern School
Barakhamba Road
New Delhi
4. Shri R.K. Tiwari
PGT
Vivekanand School
D Block, Anand Vihar
Delhi
5. Shri S. Sriram
HOD
Mayo College
Ajmer
Rajasthan

***S.No. Name of the Coordinator/Subject
Experts***

6. Mrs. Manjeet Jauhar
PGT
Vivek High Shool
Sector-38, Chandigarh
7. Shri Rajamani Natarajan
PGT
SPDH Sindhi Model Sr. Sec. School
1, Damodara Street
Kellys
Chennai
Tamil Nadu
8. Ms. Suji Gopalan
Delhi Public School
Sector-XII, R.K. Puram
New Delhi
9. Mr. M.K. Dey
Delhi Public School
Sector-XII, R.K. Puram
New Delhi

ENGINEERING DRAWING

1. Shri R.P. Chaurishiya
Vice Principal
Bhartiya Vidya Bhawan
K.G. Marg
New Delhi
2. Shri Arvind Kumar Singh Chauhan
Modern School
Vasant Vihar
New Delhi

***S.No. Name of the Coordinator/Subject
Experts***

3. Prof. N.L. Sachdeva
Rtd. Prof. from DCE
52-D, BW Block, Shalimar Bagh
Delhi
4. Dr. S.M. Kapoor
Mukherjee Memorial Sr. Sec. School
G.T. Road, Shahdara
Delhi

***S.No. Name of the Coordinator/Subject
Experts***

5. Mrs. Neelam Talwar
DL DAV Model School
ND Block, Pitampura
Delhi