

CIRCULAR:-

A reference is invited to the Ordinances, Regulations and Syllabi relating to the Bachelor of Physical Education (B.P.Ed.) degree course and the Principals of the affiliated colleges in Physical Education are hereby informed that the recommendation made by the Board of Studies in Education at its meeting held on 23rd February, 2005 has been accepted by the Academic Council at its meeting held on 2nd April, 2005, vide item No. 4.13 and subsequently approved by the Management Council at its meeting held on 16th April, 2005 vide item No.11 and that in accordance therewith the syllabus and list of reference books for the Bachelor of Physical Education (B.P.Ed.) degree course is revised as per Appendix and that the same has been brought into force with effect from the academic year 2005-2006.

Further that in exercise of powers conferred upon the Management Council under Section 54(1) and Section 55(1) of the Maharashtra Universities Act, 1994, it has made the Ordinances 3320 and Regulations 5102, 5103, 5104, 5105, 5106, 5017, 5108, 5109, 5110, 5111, 5112 and 5113 relating to the Bachelor of Physical Education (B.P.Ed.) degree course has been revised as per Appendix.

MUMBAI-400 032

19th September, 2005

To,

The Principals of the affiliated colleges in Physical Education

AC/4.13/02.04.05

MC/11/16.04.05

No.UG/ 386 -A of 2005, MUMBAI-400 032 19th September, 2005

Copy forwarded with compliments for information to :-

- 1) The Dean, Faculty of Arts
- 2) The Chairman, Board of Studies in Education

Copy to :-

The Director, Board of College and University Development, the Deputy Registrar (Eligibility and Migration Section), the Director of Students Welfare, the Personal Assistants to the Vice-Chancellor, the Pro-Vice-Chancellor, the Registrar and the Assistant Registrar, Administrative sub-center, Ratnagiri for information .

The Officer on Special Duty-cum-Controller of Examinations (10 copies), the Finance and Accounts Officer (2 copies), Record Section (5 copies), Publications Section (5 copies), the Deputy Registrar, Enrolment, Eligibility and Migration Section (3 copies), the Deputy Registrar, Statistical Unit (2 copies), the Deputy Registrar (Accounts Section), Vidyanagari (2 copies), the Deputy Registrar, Affiliation Section (2 copies), the Director, Institute of Distance Education, (10 copies) the Director of Computer Center (IDE Building), Vidyanagari, (2 copies) the Deputy Registrar (Cell), the Deputy Registrar, (PRO) . the Assistant Registrar, Academic Authority (2 copies) and the Assistant Registrar, Executive Authorities Unit (2 copies)

18/01/05

Enclosure to Item No. 4.13
2/5/05

UNIVERSITY OF MUMBAI

Ordinances and Regulations

Relating to

The Revised Course

For the Degree of the Bachelor of Physical Education (B.P.Ed.)

(with effect from academic year 2005-2006)

UNIVERSITY OF MUMBAI

EFFECTIVE FROM JUNE 2005

GOAL OF THE B.P.ED. COURSE

To prepare effective secondary teachers of physical education and academic subjects, who are capable of responding to the changing needs of the Modern Indian Society with the challenges and opportunities available therein.

GENERAL OBJECTIVES OF THE B.P.ED. COURSE

1. To enable teachers to understand the nature, purpose and philosophy of education and physical education at the secondary stage;
2. To prepare teachers of physical education with broader educational perspective;
3. To develop potentialities for planning and organizing physical education programmes and activities;
4. To develop capacity to organize leisure and recreational activities;
5. To empower them to inspire their students to actively participate in physical and yogic exercises, games and sports.
6. To enable teachers to develop personality, character, will-power, democratic values and positive attitude towards life among their students.
7. To make teachers capable of imparting basic knowledge about health, hygiene and nutrition.
8. To develop skills and competencies to organize school and community games and sports.
9. To cultivate the spirit of sportsmanship, mental and physical alertness, scientific temper and optimism.
10. To promote mental health, power of self-decision and self-control, correct judgment and action, emotional stability and equanimity, respect for other and acceptance of authority and rules.
11. To promote appreciation and interest for indigenous games, sports and yogic exercises. and
12. To create awareness about health and hygiene in the community.

ORDINANCES AND REGULATIONS
RELATING TO THE DEGREE OF THE BACHELOR OF PHYSICAL EDUCATION (B.P.Ed.)
(Revised Course)
Effective From June 2005.

3320

O.____ A candidate for the degree of Bachelor of Physical Education (B.P.Ed.) must have passed a Bachelor's degree examination of this university in any faculty or a corresponding degree examination of any other university recognized as equivalent there to and in addition must have subsequent to his passing the Bachelor's degree examination.

1. Kept-two consecutive terms for the full time B.P.Ed. course separated over a maximum period of two consecutive years in a College of Physical Education.
2. Completed practicum extending over two terms to the satisfaction of the Principal of the Institution in which the candidate is studying consisting of:-
 - a) Attendance at Demonstration lessons.
 - b) Teaching practice of not less than 20 lessons distributed over different standards from Vth to IXth of recognized Secondary schools selected by the Principal as practicing schools. In addition to these 20 lessons there will be :
 - i) 5 micro teaching lessons in Physical Education and 5 micro teaching lessons in academic subject.
 - ii) 5 other simulated lessons in Physical Education and 5 simulated lessons in academic subject.
 - c) Observations of Lessons.
 - d) The practical and project work conducted related to ICT and other Physical Education activity.
 - e) Internship of atleast one weeks duration in second term.
 - f) One essay per section in each theory paper.
 - g) Participation in social/community work of not less than 15 hours.

The examination for the degree of B.P.Ed. shall consist of 'Part A'- Theory – (External Assessment) and 'Part B' – Practicum – (Internal Assessment), details are given in RS102 and R5103

R5102
O.____ The examination for Part A and B can be taken after two consecutive terms attendance by student enrolled for the course.

R5103
O.____ A candidate for the examination in Parts A and B must apply to the Registrar with certificates required by O.____ through the Principal of the College of Physical Education in which he/she has received training.

R5104
O.____ The Internal Assessment in Part B comprising of Practice Teaching, Practical work, Year's work and practical work shall be evaluated as per the scheme in R.____. The aggregate of marks obtained out of 500 shall be converted into

Grades as per the scheme in R. _____. The Principal shall forward to the University the Grades awarded to every candidate in Part B. The Principal shall also forward to the University the original records under the four main headings: Practice teaching, Practical work, Year's work and Project work on the basis of which the Grades are awarded for scrutiny by the co-ordination committee appointed under: O. 3320. The revaluation of the scripts of internal assessment shall not be permitted.

R.S. 105
There shall be two Terminal Examinations for each paper. Both the sections in each paper will be covered by the examination, which shall be evenly spread over two consecutive terms of the B.P.Ed. course.

R.S. 106
For the purpose of co-ordination of Internal Assessment in Part B there shall be a co-ordination committee consisting of :-

- i) Chairperson, Board of Studies in Education,
- ii) Chairperson, B.P.Ed. Examination of the concerned year,
- iii) Two Principals, who are not the members of the Board of studies in Education, nominated every year by the B.O.S. in education.
- iv) Two Members of Board of Studies in Education who are not included in the above categories, nominated every year by the Board of Studies in Education,

The committee shall go through internal assessment marks and the grades awarded to students of different colleges of physical education. If any discrepancy is found in the standard of marking and / or of grading by college from the norms framed by the Board of Studies in Education, the Principal concerned would be required to accordingly modify the marks as per the directions given by the co-ordination committee. The committee is authorized to check all the internal work of the students of the college to verify the marks awarded by the college and make necessary changes wherever required.

- R.S. 107
- i) A candidate who has kept terms for the B.P.Ed. degree examination but who has either not appeared for Part A or failed in Part A, will be permitted at his option to carry forward the grade obtained in 'Part B' to three subsequent examinations. Candidates exercising this option shall not be eligible for a first or second class.
 - ii) A candidate who has kept terms for the B.P.Ed. Degree examination but who has either not appeared for 'Part A' or failed in Part A will be eligible for class provided he completes additional practical work of 'Part B' as specified in R. _____
 - iii) A candidate who has passed in 'Part A' but fails in 'Part B' will be permitted at his option to carry forward the marks obtained in 'Part A' to three subsequent examinations. The candidate be required to revise his grade in 'Part B' as specified in R. _____. Candidate exercising this option shall not be eligible for a first or second class.
 - iv) A Candidate who has passed in 'Part A' but fails in 'Part B' will be eligible for class provided he puts in regular attendance for two additional terms at the college from which he appeared for the University examination and

completes the entire work of 'Part B and reappears in 'Part A' examination conducted by the University.

- v) A candidate who fails in 'Part A' and fails in 'Part B', will be required to put in regular attendance for two additional consecutive terms at the college from which he appeared for the university examination and completes the entire work of 'Part B and reappears in "Part A' examination conducted by the University, will be eligible for the class.

R. ⁵¹⁰⁸ ~~8P~~ :- Structure of the B.P.Ed. syllabus will comprise of 'Part A'- Theory- External Assessment and 'Part B- Practicum- Internal Assessment as follows:-

R	PART A	R	PART B
	THEORY – EXTERNAL ASSESSMENT (500 Marks)		PRACTICUM - INTERNAL ASSESSMENT (500 Marks)
	I) 5 Papers X 100 marks each		I) <u>PRACTICE LESSONS</u> 250 Marks
	II) Candidates will be examined in the following subjects.		a) 10 Practice lessons in Academic subjects. (10 marks each) 100 Marks
	PAPER I : Education, Physical Education, Sports & Recreation in emerging Indian Society.		b) 10 Practice lessons in Physical Education. (10 marks each) 100 Marks
	PAPER II : Psychology of Education, Physical Education and Sports.		c) 5 other simulated lessons in academic subject (Bridge/Integrated and other innovative methods of teaching of 5 marks each) 25 marks
	PAPER III: Management, Measurements, Evaluation and Statistics in Physical Education		d) 5 officiating lessons/simulated lessons in Physical Education (5 marks each) 25 marks
	PAPER IV: Anatomy, Physiology of Exercise, Kinesiology and Health Education and Officiating and Coaching		e) 5 micro teaching lesson in academic subject and 5 micro teaching lessons in Physical Educations. (compulsory)
	PAPER V: Teaching Methods		II) <u>YEARS WORK</u> 200 Marks
	1. Physical Education (Compulsory)		a) Two terminal theory examinations 50 marks
	AND		b) Two terminal Physical Education Practical Examinations. 150 marks
	2. Any one method out of the following (Optional Method)		III) <u>PRACTICAL WORK /PROJECT WORK</u> 50 Marks
	1. Marathi		a) Information & communication Technology 25 Marks
	2. Hindi		b) Play fields marking 10 Marks
	3. English		c) Value Education 05 Marks
	4. History		d) Recreative games/lead up games 05 Marks
	5. Geography		e) Test & Measurement 05 Marks
	6. Science		
	7. Mathematics		

- [Note:- i. In case of PART-A there shall be a minimum of 40 periods per section per paper. (excluding internal examinations) Each period shall be of 50 minutes duration.
- ii. In case of PART-B there shall be a minimum of 4 periods per day for Physical Education practicals. (excluding internal examinations) Each period shall be of 60 minutes duration.]

R 5109 Practical Work – (150 Marks)

The practical work comprises of Major games and sports, Athletics, Rhythmics, formal activities, yoga and developmental exercises. The activities included in the said heads will be taught according to the secondary school syllabus of the Maharashtra State.

The details of the activities for practical work and their distributions of mark is as follows :

Group I : Major games and sports (Any twelve) (60 Marks)

Compulsory games/ sports	Optional games/sports (any four)
1. Kabaddi	1. Cricket
2. Kho-Kho	2. Badminton
3. Football	3. Table Tennis
4. Volleyball	4. Teniquite
5. Basketball	5. Softball
6. Hockey	6. Wrestling
7. Handball	7. Judo
8. Gymnastics	8. Malkhamb

Group II : Athletics (30 Marks) Any two events each from running, jumping and throwing events

Group III : Rhythmic Activities (20 Marks). Including Baroda Lezium, Dakhhani Lezium, Folk Dance, Aerobics, Band Training etc.

Group IV : Formal Activities (20 Marks) Including Wands, Dumbells, Table of Exercises and Drill & Marching etc.

Group V : Yoga and Developmental Exercises (20 Marks) Including Yoga, Suryanamaskar, Situps and Pushups (women), Dands and Baithkas (men), Weight Training etc.

R 5110 : Information and Communication Technology (25 marks).

To facilitate each student to acquire ICT competencies, at least 20 hours of hands- on experience must be provided.

The details of the Practical work is as follows :

- Fundamental of Computer** – Switching – On/Off/Restart, C.P.U., Monitor, Key-board, Mouse etc.
- Basic features of Windows** – The desktop, the Icons, Taskbar, Start button and its different element, Basic Mouse operation, Starting programme through windows.

3. **Desktop setting of windows** – Wallpaper, Screen saver, Shut down process of windows.
4. **Activation of programmes** - Paint, Notepad, Basic editing operation like cut, copy, paste, saving files, naming a file, save as etc. Floppy drive, CD-ROM drive, running, selecting, copying files, explorer- creating a folders and files, loading of software.
5. **Introduction of MS word** – Editing facilities – Bold, Italic, Underline, type of font, Alignment, Color, Spelling checking, Working with page set-up, preview, Insertion of text, working with tables.
6. **Starting Excel** – Editing worksheet, function (Mathematical & Statistical)
7. **Power Point** – Preparation of slides, Slide show.
8. **Internet** – Logging on to Internet, Internet Explorer, Search engines, Using Outlook express, Browsing the WWW.
9. **Communication** – Types of Communication (Verbal/Nonverbal), online and offline satellite communication.

Note : The present syllabus should be subject to revision as per the hardware and software changes, on the condition that the Board Of Studies should communicate the same to all B.P.Ed. Colleges at the beginning of the academic year.

The practical assessment of ICT (of 25 marks) will comprises of project work related to the following areas –

1. Managing the student fitness data by using MS Excel and creating the graphs.
2. Develop the Physical Education lesson plan with the help of MS Word.
3. Creating unit support materials with the help of WWW.
4. Creating student multimedia presentation (Teaching aids)
5. Any other innovative method related to computer application.

THE FOLLOWING RECORDS ARE REQUIRED TO BE MAINTAINED AND CERTIFIED BY THE PRINCIPAL OF THE INSTITUTION

- i) A file containing notes of lessons given and criticism made thereon.
- ii) Note book of observation of at least 20 lessons each in special method and Physical Education method out of which in case of special method 10 lessons of own method and remaining 10 lessons from other methods.
- iii) A journal of experiments in Educational Psychology.
- iv) The note books of the project work.
- v) Record of internship.

The Principal of the institution in which the candidate is studying will be required to keep a record of all the work done in the college and practicing school / Junior college, and certify that the work has been completed satisfactorily.

§111
R. The additional practical work required for candidate appearing under O. _____
ii) and iii) will be as follows :-

- Put in regular attendance for a period of at least one additional term at the college from which they appear for the University examination.
- Give 15 additional lessons (8 in Physical Education and 7 in Optional Method) under the supervision of the college authorities.
- Appear for one terminal examination (Theory and Practical)
- Write at least five essays.

The revised grade in 'Part B' to be awarded to the candidates appearing under O. _____
ii) and iii) shall be on the basis of average of the marks obtained in 'Part B' Practicum (Internal Assessment) in the first year and marks obtained in 'Part B' Practicum (Internal Assessment) in the additional term. The marks obtained in practical work (out of 50) be carried forward for averaging.

§112
R. STANDARD OF PASSING THE EXAMINATION

To pass the examination, a candidate must obtain in 'Part A' – 35 percent of the total marks in each paper and 40 percent on the aggregate, and in 'Part B' 35 percent in each of the four sub-head (Practice lessons, Practical Work, Project work and Year's work) 40 percent on the aggregate.

§113
R. With respect to the total marks gained by the candidate in Part A (out of 500) and Part –B (out of 500) one of the following grades and corresponding grade points will be accorded to the candidate as follows:-

PART A		PART B		
Percentage of marks	Grade points	Percentage of marks	Grade points	Grade
70% & above	5	70% & above	5	O
60% to 69%	4	60% to 69%	4	A
50% to 59%	3	50% to 59%	3	B
40% to 49%	2	40% to 49%	2	C
Below 40 %	1	Below 40%	1	D

Note. To pass the examination with class the candidates will have to earn the total credit points including Part A and Part B as follows:-

1 st class with distinction	10
Ist class	8&9
II nd class	6&7
Pass class	4&5
Less than 4 credit points	Declared Fail

Note: If a candidate gets less than 2 grade points in either Part A or Part B he/ she will be declared 'Fail' inspite of total credits being 4 or more.

PAPER - I
EDUCATION, PHYSICAL EDUCATION, SPORTS AND RECREATION IN EMERGING
INDIAN SOCIETY

OBJECTIVES:-

1. To understand the relationship between Philosophy, Education and Physical Education.
2. To understand ancient goals of education, meaning, scope and functions of education.
3. To acquaint the student with the modern goals of education and Physical Education.
4. To enable the student to understand and appreciate the teachers role in shaping the emerging Indian society.
5. To become acquainted with the role of different agencies of Education and Physical Education
6. To understand the contribution of philosophers of Education and Physical Education.
7. To acquaint the student with History of Physical Education
8. To understand the modern development and social aspects of Physical Education.

Section - I
Education In Emerging Indian Society

Unit I Education, Physical Education and Philosophy

- a) Meaning and nature of Philosophy.
- b) Meaning and Scope of Education, Physical Education, philosophy and their interdependence
- c) Role of education and Physical Education in emerging Indian society- Economical, political, social and cultural.

Unit II Goals of Education and Physical Education

- a) Ancient Indian goals : Dharma, Artha, Kama and Moksha
- b) Modern Indian goals
 - i) The goals of Education derived from constitution of India 1950.
 - ii) Secondary education commission 1952-53
 - iii) Education Commission 1964-66.
 - iv) National policy on education, 1986.
 - v) Policy on education and Physical Education, 1992

Unit III Curriculum

- a) Concept, principles and determinants of curriculum design.
- b) Types of curriculum : knowledge, activity, core curriculum.
- c) Role of the teacher and state in curriculum construction.

- Unit IV**
- Agencies of Education and Physical Education**
- a) Types of agencies
- b) Role of the following agencies in Education and Physical Education
- Family
 - Peer group
 - Community
 - School
 - Voluntary organizations
 - Mass media

- Unit V**
- Contributions of Educational Thinkers**
- Rabindranath Tagore
 - Mahatma Jyotirao Phule
 - Mahatma Gandhi
 - John Dewey
- Marshi Dhomdo Keshav Karve*

- Unit VI**
- Role of the teacher in changing society**
- Professional Ethics
 - Roles of the teacher.

Reference Books

- Adams, William.C – Foundation of Physical Education Exercise and Sports Science, Lea and Febigor , Philadelphia, 1991.
- Bhatia, K.K. & Narang,C.L– Philosophical & Sociological Bases of Education, Prakash Bros. , Ludhiana,1984.
- Bhatia, K.K. & other– Modern Indian Education and its problems, Prakash Bros. , Ludhiana, 1985.
- Bokil, V.P. - Foundation of Education, Pune University, Pune,1970.
- Bucher,Charles – Foundation of Physical Education, The C.U. Mosby Saint Louis, 1975.
- Chaube, S.P.- Great Indian Educational Philosophers, Pustak Mandir, Agra, 1987.
- Dash, B.N. – Principles of Education, Neelkamal publication, Hyderabad,2003.
- Harper William and other – Physical Process in Physical Education, 3rd Ed., Philadelphia, 1979
- Mittal, S.C. – Compendium of Educational Statistics (School Education), NCERT, New Delhi, 2003.
- N.C.E.R.T. teacher and education in emerging Indian society, New Delhi.
- Nanda, S.K. - Indian Education and its Problems Today, Kalyani Publications, New Delhi ,1977.
- National Council for Teacher Education. Gandhi on Education, NCTE, New Delhi ,1998.
- Pandey, R.S.-Philosophical & Sociological foundation of education, Vinod Pustak Mandir, Agra, 1991.
- Sampat, Gayatonde, &S , Ganapathy – Education in Changing Indian Society
- Saxena, Swaroop – Philosophical & Sociological Foundation of Education, Surya Publication, Meerut, 1998.

16. Sonu & Brubacher, - Modern Philosophies of Education-4th Ed., Tata Mc.Grow Hill publication Co. Pvt. Ltd., Bombay, 1969.
17. Torcatto, Lourenco C. - Education, its history and philosophy, Research Institute of Education & Philosophy & Religion, Mumbai, 1970.
18. गद्रे, गीता, गद्रे, ल.रा. - शिक्षणाचा इतिहास भाग-१, २, नूतन प्रकाशन, पुणे, १९७६.
19. गाजरे/ महंत - उदयोन्मुख भारतीय समाजातील शिक्षण भाग -१, २, नूतन प्रकाशन, पुणे, १९९२.
20. आळंदकर, ज.ज्ञा. - शिक्षणाचे आणि अध्यापनाचे शास्त्र, श्रीलेखनवाचन भांडार, पुणे, १९६८.
21. अहेर हिरा - उदयोन्मुख भारतीय समाजातील शिक्षण व शिक्षक, विद्या प्रकाशन, नागपुर, १९८५
22. अकोलकर, ग.वि. - शैक्षणिक समाजशास्त्राची रूपरेषा, श्रीविद्या प्रकाशन, पुणे, १९७३.
23. अकोलकर, ग.वि. - शैक्षणिक तत्त्वज्ञानाची रूपरेषा, श्री. विद्या प्रकाशन, पुणे, १९७३.
24. अकोलकर, ज.ज्ञा. - शिक्षणाचे आणि अध्यापनाचे शास्त्र, श्रीलेखनवाचन भांडार, पुणे, १९६८
25. जैन, कपूरचंद - भारतीय शिक्षा का इतिहास, विनोद पुस्तक मंदिर, आग्रा, १९९१.
26. चौबे, सरयु प्रसार - शिक्षा के समाज शास्त्रीय आधार, विनोद पुस्तक मंदिर, आग्रा, १९९१.
27. वर्मा, रामपाल सिंह - शिक्षा में नवचिंतन, विनोद पुस्तक मंदिर, आग्रा, १९९१
28. दुनाखे, अरविंद, देशपांडे, लीना - शिक्षणाचे समाजशास्त्र एक-रूपरेषा, नूतन प्रकाशन, पुणे, १९७७
29. सोहोनी, गो.प्र. - आदर्श शिक्षक, नूतन प्रकाशन, पुणे, १९७७.
30. प्राध्यापक गण - शिक्षा के सिद्धांत तथा तकनीकी, विनोद पुस्तक मंदिर, आग्रा १९९१
31. प्रा. प्रभारक वीरकर/ डॉ. प्रतिभा वीरकर - उदयोन्मुख भारतीय समाजातील शिक्षण व शिक्षक, द्वारका प्रकाशन, पुणे, १९८५
32. पवार, ना.ग. - उदयोन्मुख भारतीय समाजातील शिक्षण, नूतन प्रकाशन, पुणे, १९९२
33. पवार, ना.ग. - उदयोन्मुख भारतीय समाजातील शिक्षण तज्ञ, नूतन प्रकाशन, पुणे, १९९०.
34. पवार, ना.ग. - शिक्षण क्षेत्रातील विचारवंत, नूतन प्रकाशन, पुणे, १९९५.
35. पाटील, लिला - आजचे शिक्षण आजच्या समस्या, श्री. विद्या प्रकाशन, पुणे, १९७४.
36. माणकीकर, श्रा.प्र. - शिक्षणशास्त्राची मूलतत्वे, श्रीलेखन-वाचन भांडार, पुणे, १९६२.
37. मराठे, रा.रा. - शिक्षणाची मूलतत्वे, मोघे प्रकाशन, कोल्हापूर, १९७८.
38. कुंडले, म.बा. - शैक्षणिक तत्त्वज्ञान व शैक्षणिक समाज शास्त्र, श्री. विद्या प्रकाशन, पुणे, १९७३.
39. बोरोले, जे.के. - शैक्षणिक तत्त्वज्ञान आणि मानसशास्त्र, उषा प्रकाशन, औरंगाबाद, १९९१
40. बोकील, वि.पा. - शिक्षणाचे तत्त्वज्ञान, चित्रशाळा प्रेस, पुणे, १९६०.
41. धारूरकर य.ज. - शैक्षणिक तत्त्वज्ञान, व्हीनस प्रकाशन, पुणे, १९७३.

Section - II
Physical Education, Sports And Recreation In Emerging Indian Society

- Unit I Physical Education**
- a) Meaning, Definition and Role of Physical Education.
 - b) Aims and objectives of Physical Education
 - c) Scope and interpretation of physical education
 - d) Contribution of Physical Education to general Education.
- Unit II Various Commission, Thinkers & their Contribution to Physical Education**
- a) Dr. Kunzaru Committee
 - b) Kaul-kapoor Committee
 - c) Report on physical education by Kothari commission 1966
 - d) Swami Kuvalayanand
 - e) Baren de Caubertin
 - f) Prof. Manikrao
- Unit III History of Physical Education**
- a) Indian Physical Education
 - b) Contribution of Greece, U.S.A. Germany and Russia to the development of physical education and sports
 - c) History of Ancient and modern Olympic games.
 - d) Asian games
- Unit IV a) Modern Development of Physical Education in India.**
- i) L.N.I.P.E. (Gwalior)
 - ii) Y.M.C.A.
 - iii) N.S.N.I.S.
 - iv) Scouting and Guiding
 - v) S.A.I.
 - vi) Awards and trophies of Sports at various level
 - 1) Shivchhatrapati, Arjun, Dadoji Konddev, Dronacharya, Eklavya, Rajiv khel Ratna Purskar
 - 2) Trophies – Ranaji, Santosh, Agakhan Gold cup, Devis cup.
 - 3) Various scheme of State and Central Government to promote Physical Education.
- b) Social aspects of Physical Education**
- i) Meaning and Nature of social change.
 - ii) Social change through Physical Education
 - iii) Factors affecting social change through Physical Education
- Unit V Yogic Education & recreation**
- a) Meaning, Scope and Elements of Yoga
 - b) Misconceptions about yoga
 - c) Difference between physical education exercises and yogic exercises
 - d) Meaning, Definition and scope of Recreation
 - e) Principles of Recreation

Reference Books

1. Barrow, H.M., Brown, I.P. : Man and Movement – Principles of Physical Education (IVth Ed.), Lea & Febiger Philadelphia, 1988.
2. Beashel, Paul & Taylor, John – Advanced Studies in Physical Education and Sports, Thomas Nelson and Sons Ltd., U.K, 1996
3. Buchar, C.A. & Wuest, D.A. : Foundation of Physical Education and Sports – (Xth Ed.), Times Niwor / Mosby College publicating, St. Louis, Misscuri-63146, 1987
4. Bucher, C.A. : Foundation of Physical Education, (VIIth Ed.), the C.V, Mosby company, SAINT LOUIS, 1975.
5. Freeman, W.H. : Physical Education and Sports in a Changing Society (IInd Ed.), Burgess publishing company, Minncapolis, Minnccsota – 55435, 1982.
6. Gharote, M.L. : Applied Yoga, Kaivalyadhama, Lonavla – 410403, 1990.
7. Gharote, M.L., Gharote, M.M. : Swami Kuvalyanand – A Pioneer of Scientific Yoga and Indian Physical Education, the Lonavla Yoga Institute (India), 1999.
8. Hillcourt, William Bill : Official Boy Scout Handbook, Boy scouts of America, 1980.
9. Horne, John, Tomlinson D : Understanding Sports: An Introduction to the Sociological & Cultural Analysis of Sports, E & FN spon, London, 1999.
10. Kamles, M.L. & Sangral, M.S. : Principles and History of Physical Education, Prakash Brothers, Ludhiana, 1981.
11. Krishnamurthy, V. & Parameswara, R. : Educational Dimension of Physical Education, Sterling publication Pvt. Ltd., New Delhi – 110 064, 1980.
12. Sharma, O.P. : History of Physical Education, Khel Sahitya Kendra, Delhi-11052, 1988.
13. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London, 1994.
14. Tirunarayanan, C. & Hariharasarma, S. : An Analytical History of Physical Education (IIIrd Ed.), The South India Press, Karaikadi (India), 1981.
15. Wakharkar, D.G. : Handbook of Physical Education, Friends Publication, New Delhi, 1995
16. Wesson, Kevin, Wiggins, N. : Sports and Physical Education : A Complete Guide to Advanced Level Study, Hodder & Stoughton, London, 1998.
17. गोगटे, भा.रा. : शारीरिक शिक्षणाचा ओनामा, प्रथम आवृत्ती, अखिल महाराष्ट्र शारीरिक शिक्षण मंडळ प्रकाशन, पुणे-२, १९६९.
18. गोगटे, भा.रा. : शारीरिक शिक्षणाची तत्वे व स्वरूप, अखिल महाराष्ट्र शारीरिक शिक्षण मंडळ प्रकाशन, पुणे, १९५५.

19. गोगटे, भा.रा. : शारीरिक शिक्षण : विकास व नियोजन, दुसरी आवृत्ती, अखिल महाराष्ट्र शारीरिक शिक्षण मंडळ प्रकाशन, पुणे, १९६८.
20. आर्यंगार, बी.ले.एस. : योगदीपिका, ओरिएंट लॉगमन, हैद्राबाद-२९, १९७५.
21. अहेर, हि. : उदयोन्मुख भारतीय समाजातील शिक्षण व शिक्षक, विद्या प्रकाशन, नागपूर, १९९५.
22. जर्दे, श्री., जर्दे, सु. : शारीरिक शिक्षण -तत्वे व स्वरूप, चंद्रमा प्रकाशन, कोल्हापूर, १९९१
23. जर्दे, श्री. : शारीरिक शिक्षणाचा इतिहास भाग-१,२ अंका प्रकाशन, कोल्हापूर, १९८८.
24. जर्दे, श्री. : योगाभ्यास-सुखी जीवन, चंद्रमा प्रकाशन, कोल्हापूर-३, १९९५.
25. चौबे, एम., पाठक, जे.के. : शारीरिक शिक्षा के मूलाधार, कल्याणी पब्लिशर्स, लूधियाना, १९७७.
26. वाखारकर, दि.गो., आलेगावकर, ए.म. : शारीरिक शिक्षणाचे ऐतिहासिक स्वरूप, पार्वती प्रकाशन संस्था, पुणे, १९८४.
27. पॉवेल, बेडेन : स्काऊट शिक्षण, २री आवृत्ती, मुंबई महाराष्ट्र राज्य भारत स्काऊट आणि गाईड, १९६४.
28. भटकर, आर.एम. : शारीरिक शिक्षणाचा जागतिक इतिहास भाग -१, प्रकाश प्रिंटिंग प्रेस, परवाडा, १९८८.
29. कोठीवाले, द.ब. : शारीरिक शिक्षणाचा विकास-भाग १, आर्यभूषण मूद्रणालय, पुणे, १९६५.
30. कमलेश, एम.एल., संग्राम, एम.एस. : शारीरिक शिक्षा के सिद्धान्त तथा इतिहास, प्रकाश ब्रदर्स, लूधियाना, १९८४.
31. कंवर, आर.सि. : शारीरिक शिक्षा के सिद्धान्त एवं इतिहास, अमित प्रकाशन, नागपूर, १९९५.
32. शिवकरण श्री. : शारीरिक शिक्षा का इतिहास, स्पोर्ट्स पब्लिकेशन्स, नई दिल्ली, २००४.
33. थानी, एकता : शारीरिक शिक्षा के सिद्धान्त, स्पोर्ट्स पब्लिकेशन्स, नई दिल्ली, २००४.

PAPER - II
PSYCHOLOGY OF EDUCATION, PHYSICAL EDUCATION AND SPORTS

OBJECTIVES :

1. To develop an understanding of the nature, scope and methods of Psychology of Education, Physical Education and sports.
2. To acquire knowledge of the stages of growth and development with special emphasis on childhood and adolescence and its importance in Physical Education and Sports.
3. To understand the process of development and its different dimensions and the factors affecting them.
4. To understand the nature, extent and causes of individual difference.
5. To understand the role of teacher in fostering creativity among pupils.
6. To understand the significance of the concept of personality and adjustment of personality with special reference to Physical Education and Sports.
7. To understand the nature, process and factors facilitating and obstructing learning.
8. To understand group structure and group dynamics as relevant to classroom situations.
9. To understand the significance of Psychological experiments.

Section - I
Psychology Of The Learner

Unit I Educational Psychology

- a) Meaning and nature of Psychology
- b) Psychology of education, physical education and sports, nature, scope and limitations.
- c) Methods of Educational Psychology and their importance in Physical Education and Sports.
 - i) Introspection
 - ii) Observation
 - iii) Experimental
 - iv) Clinical Method

Unit II Psychology of development

- a) The concept and principles of development
- b) Stages of development and their importance in Physical Education and Sports (with special reference to childhood & Adolescence stage)

- Unit III Individual Differences**
- a) Meaning and significance of intra and inter individual difference in Education, Physical Education and Sports.
 - b) Influence of heredity and environment in the development of an individual.

- Unit IV Intelligence and Creativity**
- a) Concept of intelligence
 - b) Gardner's theory on intelligence
 - c) Measurement of intelligence
 - d) Uses of Intelligence tests.
 - e) Meaning of creativity and characteristics of a creative person.
 - f) Process of creativity.
 - g) Teachers role in fostering creativity.

- Unit V Personality and Adjustment**
- a) Concept and types of personality
 - b) Personality development through Education, Physical Education and Sports.
 - c) Mental health and hygiene-meaning and importance
 - d) Types of conflicts
 - e) Frustration
 - f) Defence Mechanism
 - g) Maladjustment, its causes and preventive measures

Reference Books

1. Beashel, Paul & Taylor, John : Advance Studies in Physical Education and Sports, Thomas Nelson & Sons Ltd., U.K., 1996.
2. Bhatiya and Bhatiya : A Text Book of Educational Psychology, Doaba House Book sellers and Publishers, 1688, Nai Sarak, Delhi – 110 006, 1998.
3. Charl Skinner : Educational Psychology, Prentic hall of India Pvt. Ltd., New Delhi, 1977
4. Dandekar W.N. : Psychological Foundations of Education, Macmillan India Ltd., V.N. Rao at Macmillan India Press, Madras, 1995
5. Kamlesh M.L. : Psychology of Physical Education and Sports, Metro Politan Book Co.Pvt. Ltd., New Delhi-110 002, India, 1998
6. Lovell, K. : Educational Psychology and Children-11Ed., Hodder & Stoughton, London, 1973.
7. Wesson, Kevin, Wiggins, N. : Sports and Physical Education : A Complete Guide to Advanced Level Study, Hodder & Stoughton, London, 1998.
8. आफळे, बापट : शिक्षणाचे मानसशास्त्रीय अधिष्ठान, श्रीविद्या प्रकाशन, शनिवार पेठ, पुणे, १९७८
9. दांडेकर, वा.ना. : शैक्षणिक व प्रायोगिक मानसशास्त्र, मोघे प्रकाशन, १४४० शुक्रवार पेठ, पुणे, १९८१.
10. माथूर, एस.एस. : शिक्षा मनोविज्ञान, बम्बरीश कम्पो हाउस, आगरा-२, १९८९.
11. कुलकर्णी, के.वि. : शैक्षणिक मानसशास्त्र, विद्याप्रकाशन, शनिवार पेठ, पुणे-३०, १९७७.
12. खरात, आ.पा. : प्रगत शैक्षणिक मानसशास्त्र, विद्या प्रकाशन, शनिवार पेठ, पुणे, १९८२

Section - II

Processes Of Learning In Education & Physical Education

- Unit I** **Concept and Nature of learning in Education & Physical Education**
- a) Concept, Nature and process of learning
 - b) Psychological factors affecting learning
 - i) Maturation : Concept and importance
 - ii) Attention : Types and Educational implication.
 - iii) Faigue : Causes, types and prevention
 - iv) Motivation : Concept, Types and Importance in Education, Physical Education & Sports.

- Unit II** **Theories of learning applied to Physical Education**
- a) Theories of learning
 - i) Thorndike's Trial and error
 - ii) Pavlov's Theory of Conditioning
 - iii) Learning by insight
 - b) Transfer of learning
 - i) Meaning, types, theories of transfer and their educational implications.
 - ii) Transfer of learning applied to Physical Education.
 - c) Learning curve applied to Physical Education.

- Unit III** **Learning and its related mental processes applied to Physical Education**
- Mental Processes,
- i) Sensation & perception
 - ii) Memory – Concept, types, factors affecting memory, how to develop memory.
 - iii) Forgetting – Nature, causes
 - iv) Thinking – Perceptual, conceptual, ideational,
 - v) Imagery and Imagination

- Unit IV** **Group Dynamics**
- a) Characteristics of a group
 - b) Types of Group
 - c) Leadership and sociometry.

EXPERIMENTS TO BE CONDUCTED AND RECORDED IN JOURNAL:-

- i) Association
- ii) Attention.
- iii) Transfer of learning

- iv) Fatigue
- v) Perception
- vi) Imagination
- vii) Memory
- viii) Learning curve
- ix) Intelligence
- x) Perseveration

Reference Books

1. Bhatiya and Bhatiya : A Text Book of Educational Psychology, Doaba House Book sellers and Publishers, 1688, Nai Sarak, Delhi – 110 006, 1998.
2. Charl Skinner : Educational Psychology, Prentic hall of India Pvt. Ltd., New Delhi, 1977
3. Dandekar W.N. : Psychological Foundations of Education, Macmillan India Ltd., V.N. Rao at Macmillan India Press, Madras, 1995
4. Gupta, Kusum : Educational Psychology, Krishna Brothers, Amrutsar, 1969.
5. Gupta, Sushilchandra : Psychology Applied to General Education and Physical Education, Pragati Prakashan, Meerut, 1985
6. Kamlesh M.L. : Psychology of Physical Education and Sports, Metro Politan Book Co.Pvt. Ltd., New Delhi-110 002, India, 1998
7. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London, 1994.
8. आफळे, बापट : शिक्षणाचे मानसशास्त्रीय अधिष्ठान, श्रीविद्या प्रकाशन, शनिवार पेठ, पुणे, १९७८
9. दांडेकर, वा.ना. : शैक्षणिक व प्रायोगिक मानसशास्त्र, मोघे प्रकाशन, १४४० शुक्रवार पेठ, पुणे, १९८१.
10. वर्मा, प्रीती डी.एन.श्रीवास्तव : आधुनिक सामान्य मनोविज्ञान, विनोद पुस्तक मंदिर, आगरा, १९९२.
11. पाठक, पी.डी. : शिक्षा मनोविज्ञान, विनोद पुस्तक मंदिर, आगरा-२, १९९२.
12. कुलकर्णी, के.वि. : शैक्षणिक मानसशास्त्र, विद्याप्रकाशन, शनिवार पेठ, पुणे-३०, १९७७.
13. खरात, आ.पा. : प्रगत शैक्षणिक मानसशास्त्र, विद्या प्रकाशन, शनिवार पेठ, पुणे, १९८२
14. माथूर, एस.एस. : शिक्षा मनोविज्ञान, बम्बरीश कम्पो हाउस, आगरा-२, १९८९.
15. नानकर, प्रभाकर : सुबोध शैक्षणिक मानसशास्त्र, नूतन प्रकाशन, पुणे, १९९२.
16. सपरा, चारू : खेल मनोविज्ञान, स्पोर्ट्स पब्लिकेशन्स, नई दिल्ली, २००४.

PAPER - III
MANAGEMENT, MEASUREMENTS, EVALUATION AND STATISTICS IN PHYSICAL EDUCATION

OBJECTIVES :

1. To understand the importance of management of Physical Education
2. To gain knowledge regarding management of Physical Education and Sports at different level.
3. To gain knowledge regarding the organization of various Physical Education programmes.
4. To acquire knowledge regarding development of infrastructure and maintenance of facilities needed for Physical Education and Sports.
5. To gain knowledge of various schemes and plans of State/Central Government.
6. To understand the importance of measurement and evaluation in field of Physical Education.
7. To gain knowledge regarding selection, construction and administration of tests.
8. To acquire the knowledge of various tests regarding physical fitness components and motor fitness.
9. To understand the use of sports skill tests
10. To acquire the knowledge of evaluation procedures of Physical Education as per school curriculum
11. To understand the use and method of statistics in evaluation

Section – I
Management of Physical Education

Unit I Introduction

- a) Meaning, Need and scope of management of Physical Education
- b) Elements, Functions, Principles of Sports Management
- c) Organization of Physical Education department at
 - i) School
 - ii) College
 - iii University level
- d) Organization of Sports at National, State, District, Taluka and Village level by the State Government & other voluntary organization of sports.

Unit II Management of facilities

- a) Construction, marking and maintenance of play grounds, track & field, gymnasium, swimming pool and athletic track.
- b) Equipment – Purchase, care and maintenance.
- c) Maintenance of records and registers.

- i) Related to pupil welfare- Attendance, Examination, Health, Sports achievement, cumulative and special
- ii) Concerned with school administration-general administration, equipment, dead stock, recurring, non-recurring expenditure
- d) Human Resources management.
 - i) responsibilities and inter relationships-, Head Master, Supervisor, Physical Education teachers, subject teachers, Managerial staff, Pupil leaders and parents
 - ii) Qualities of good manager.

Unit III

Physical Education Programmes and Planning

- a) Physical Education programmes for school children- Primary, secondary and higher secondary.
- b) Physical Education and Sports programmes for special awareness – demonstration, play days, sports rallies, sports exhibitions.
- c) Time table – Factors influencing the preparation of Physical Education Time table.
- d) Physical Education Budget:
Need and Importance, procedure and principles of budget making, Income and expenditure details, administration, accounting and auditing.

Unit IV

Public Relation in Physical Education

- a) Meaning, Aim, Need & Importance of Public Relation in Physical Education.
- b) Sources of public relation.
- c) Principles of public relation.
- d) Role & Responsibilities of Physical Education teacher in public relation.

Unit V

Organization of co-curricular activities and various programmes.

- a) Organization of National days (15th August & 26th January).
- b) Organization of competition for masses, mass Athletics and Cross country.
- c) Organization of sports day, hiking, trekking, camping and picnics.
- d) Ceremonies in competition – Opening, closing and victory ceremony.

Unit VI

Supervision in Physical Education

- a) Meaning & Scope of Supervision
- b) Principles of Supervision
- c) Techniques of Supervision
- d) Qualities of a supervisor

Reference Books

1. Beashel, Paul & Taylor, John : Advance Studies in Physical Education and Sports
Thomas Nelson & Sons Ltd., U.K.1996.
2. Bucher, C.A. & Koeniz C.R. : Methods and Materials for Secondary School Physical Education, 6th Ed., C.V. Mosly Co., London, 1983.

3. Bucher, Charles A. : Administration of Physical Education and Athletic Programme 8th Ed., C.V. Mosly Co., London, 1983.
4. Dheer & Kamal Radhiks : Organization and Administration of Physical Education, Friends Publication, New Delhi, 1991
5. Gandhi, S.S. : India's Highest Sports Awards And Those Who Won Them, The Defense Review, New Delhi, 2001
6. Horin, Lory : Administration of Physical Education and Sports Programme, Sounders College, Philadelphia, 1985.
7. Joseph, P.M. : Organization of Physical Education, the old student Asso. Bombay publication, 1956
8. Kamlesh M.L. : Management Concept of Physical Education and Sports, Metropolitan, Delhi, 2000.
9. Luthans and Martinko : The practice of Supervision and Management, Dryden Press, Japan, 1983.
10. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London, 1994.
11. Two Experienced Professors : Organization and administration and Recreation in Physical Education, Prakash Brother, Ludhiana, 1991.
12. Voltmer. Edward & other : Organization and administration of Physical Education 5th Ed., Prencice hall, Newjeresy, 1979.
13. Wesson, Kevin, Wiggins, N. : Sports and Physical Education : A Complete Guide to Advanced Level Study, Hodder & Stoughton, London, 1998.
14. Zeigler E.F./ Bowie, G.W. : Management Competency Development in Sports and Physical Education, Philadelphia, 1983.
15. अरोडा, पी.के. : शारीरिक शिक्षा के संघटन संचालन एवं मनोरंजन, प्रकाश ब्रदर लुधियाना, १९८४.
16. सुखिया, एस.पी. : विद्यालय प्रशासन एवं संगठन, विनोद बुक, आग्रा, १९९२ .
17. शारीरिक शिक्षण आणि आरोग्य शिक्षक हस्तपुस्तिका, ई. ५वी ते ९वी, महाराष्ट्र राज्य पाठ्य पुस्तिका निर्मिती मंडळ, पुणे.
18. पांडेय लक्ष्मीकांत : शारीरिक शिक्षा एवं संघटन प्रशासन 3rd Ed , प्रभात बुक, ग्वालीयर, १९८५.
19. तिवाडी शंकर : शारीरिक शिक्षणाचे संघटन आणि प्रशासन, शारदा प्रकाशन, नांदेड, १९८६.
20. करमरकर अ.के. : शारीरिक शिक्षा संघटन प्रशासन, सुयोग प्रकाशन, अमरावती, १९९५.
21. पसरिजा, मीनू : शारीरिक शिक्षा संगठन एवं प्रशासन, स्पोर्ट्स पब्लिकेशनस्, नई दिल्ली, २००४.
22. पसरिजा, मीनू : शारीरिक शिक्षा की विधियां, स्पोर्टस् पब्लिकेशनस्, नई दिल्ली, २००४.

Section - II

Measurements, Evaluation And Statistics In Education and Physical Education.

- Unit I Introduction**
- a) Meaning of Test, Measurement and Evaluation in Education and Physical Education.
 - b) Need and importance of Test, Measurement and Evaluation in Physical Education.
- Unit II Selection, Construction and Administration of Test**
- a) Criteria of test selection.
 - b) Construction of knowledge test
 - c) Administration of test
- Unit III Physical and Motor Fitness and Sports skill tests**
- a) Strength test
 - i) Sergeant test
 - ii) Kraus weber test
 - b) Cardic-vascular test
 - i) Harvard step test
 - ii) Cooper's 12 minute run and walk test
 - c) General Motor fitness test
 - i) AAPHER youth fitness test
 - ii) J.C.R. test
 - iii) SAI Battéry of tests
 - d) Sports Skill Tests
 - i) Lokhart and Mc B.herson Badminton Test
 - ii) Miller Volleyball test
 - iii) Johnson Basketball test
 - iv) Lei Lich Basketball test
- Unit IV Evaluation of Physical Education**
- a) Curriculum of Physical Education for Std. Vth to XIIth of Maharashtra State
 - b) Evaluation procedures of the Physical Education subject in school curriculum.
- Unit V Statistical methods and interpretation of scores.**
- a) Need
 - b) Tabulation of data
 - c) Graphical representation – Histogram & Frequency Polygon.
 - d) Measures of Central tendency – Mean, Median, Mode.
 - e) Measures of variability – Range, Quartile deviation, Standard deviation.
 - f) Percentile and percentile ranks
 - g) Coefficient of Correlation – Spearman's rank rule method

Reference Books

1. Andrew and Jackson : Instructors manual, measurement, evaluation in Physical Education, Allanta Dullas, Geneva, 1981.
2. Banmgartner and Jackson : Measurement for Evaluation in Physical Education, Instructor's Manual, Houghton Mifflin Col. Boston, 1975.
3. Barrow and Rosemary Mc. Gee : Practical Approach to Measurement in Physical Education, Lea and Febiger, Philadelphia, 1979.
4. Bosco J.S. and F.G. William : Measurement and Evaluation Fitness and Sports, Prentice Hall, New Jersey, Inc. 1983.
5. Clarke, Harison and Clark H. David : Application of Measurements in Physical Education , Prentice Hall, Englewood Cliff, New Jersey, 1987.
6. Eckert H.M. : Practical Measurement of Physical Performance, Lea and Febiger, Philadephic, 1974.
7. Garretl, H. E. and Woodward : Statistics in Psychology and Education, Greenwood Press, Westport, 1966.
8. Haskins, M.J. : Statistical Evaluation in Physical Education, WMC Brown Dubuque, 1971.
9. Johnson Barry L. and Nelson K. : Practical Measurement for Evaluation in Physical Education, Indian Reorint, Surjeet publication, Delhi, 1982.
10. Kansal, Devinder K. : Test and Measurement in sports and Physical Education, D.V.S. Publication, 100 T.K. Giri Nagar, Kulkaji, New Delhi, 1996.
11. Montoye Henry J. : An introduction to Measurement in Physical Education, Allyn and Bucon Inc. 470, Atlantic Avenue Boston, 1970.
12. Morehouse, C.A. and Stull, G.A. : Statistical Principles and Procedures with Applications for Physical Education , Henry Kimpton, London, 1975.
13. Morrow, James. R. et. al : Measurement and Evaluation in Human Performance Human Kinetics, Champaign, U.S.A., 1995.
14. Philips and Hornak James E. : Measurement and Evaluation in Physical Education, 1979.
15. Safrit, Margaret J. : Introduction to Measurement in Physical Education and Exercise Science, Times Mirror/Mosby College publishing, St. louis, Toronto, Bastan, 1990.
16. Scoot, G.M. : Measurement and Evaluation in Physical Education, W.M.C. Brown Co. Iowa, 1972.
17. Shaw, Dhananjay : Fundamental Statistics in Physical Education and Sports Sciences, Sports Publication, New Delhi, 1998.
18. Varma, Prakash J. : Sports Statistics, Venus Prakashan, Gwalior, 2000.
19. श्रीवास्तव, अजयकुमार : शारीरिक शिक्षा में परीक्षण और मापन, अमीत ब्रदर्स पब्लिकेशन, ६७२ स्ट्रीट, धंतोली, नागपूर, १९९५.
20. आरोग्य व शारीरिक शिक्षण हस्तपुस्तिका इयत्ता पाचवी ते दहावी, महाराष्ट्र राज्य पाठ्यपुस्तिका निर्मिती मंडळ, पुणे.
21. वांगवाड, व्यंकटेश शंकर तिवारी : शारीरिक शिक्षण मापन मूल्यमापन, क्रीडातंत्र प्रकाशन, पुणे - ३७, १९९५
22. दांडेकर, वा.ना. : शैक्षणिक मूल्यमापन व संख्याशास्त्र, श्रीविद्या प्रकाशन, पुणे, १९७४.
23. मस्के, टी.ए. : शैक्षणिक संख्याशास्त्र, प्रज्ञा प्रकाशन, पुणे, १९८८
24. कदम, चा.प. : शैक्षणिक संख्याशास्त्र, नूतन प्रकाशन, पुणे, १९८९

PAPER - IV
ANATOMY, PHYSIOLOGY OF EXERCISE, KINESIOLOGY and HEALTH
EDUCATION AND OFFICIATING AND COACHING.

OBJECTIVES :-

1. To enable the student to understand the basic structure and function of human body.
2. To acquire the knowledge regarding effect of exercise on the body as a whole.
3. To understand the importance of normal movements of the human body and kinesiological analysis.
4. To acquire the knowledge regarding the basic Physiological and Mechanical principles involved in the efficient body movements.
5. To enable the students to understand the need and importance of health education and community health.
6. To acquaint the students with school health programme.
7. To acquire the knowledge regarding awareness, precaution & understanding HIV/ AIDS preventive education.
8. To understand the basic concept and principles of officiating and coaching of different games and sports.
9. To enable the students to understand the rules, regulations and officiating of different games and sports.
10. To acquaint the students with the duties and responsibilities of an officials and coaches.
11. To acquaint the students with dimensions and actual markings of different play fields, courts and arenas.
12. To understand the methods of conditioning exercises, planning and periodisation of training.

Section - I

Anatomy, Physiology of Exercise, Kinesiology and Health Education

Unit – I Introduction to human body

- a) Meaning of Anatomy and Physiology
- b) Need and importance of the study of human body.

Body systems – Structure, functions and effect of exercise.

Musculo-skeletal system.

- i) Types and Characteristics of muscle.
 - ii) Types of contractions.
 - iii) Classification, structure and functions of bones.
 - iv) Postural defects and corrective measures.
 - v) Effect of exercise on musculo-skeletal system.
- Cardio-respiratory system**
- i) Heart– structure and function.
 - ii) Blood -constituents and functions
 - iii) Circulation of blood
 - iv) Mechanism, control and types of respiration.
 - v) Effect of exercise on cardio-respiratory system
- Digestive System**
- i) Digestion and effect of digestive juice and enzyme on food.
 - ii) Balance diet and diet for athlete.
 - iii) Effect of exercise on digestive system.
- Nervous System**
- i) Central nervous system – structure and function.
 - ii) Autonomic nervous system – structure and function.
 - iii) Effect of exercise on nervous system.
- Endocrine System**
- i) Hormones, Role of following endocrine glands on growth, development and regulation of body activities..
 - 1) Pituitary
 - 2) Thyroid
 - 3) Adrenal
 - 4) Islets Langerhans

Applied and structural Kinesiology

- Scope and importance of kinesiology in physical education and sports..
- Aim, objectives and need of Kinesiology.
- Terminology of various types of movements around the joints.

Principles concerning human movements.

- Motion, law of motion, equilibrium.
- Force, centripetal and centrifugal force, gravity.
- Classification of lever, utility of lever in the sports.
- Application of basic mechanical principles to the fundamental skills in running, jumping and throwing.

- Unit V Health Education**
- a) Health – meaning and principles.
 - b) Objectives of school health programme, necessity of teaching health education in school.
 - c) Role of community with special reference to HIV/AIDS and STD, behavioural approach toward HIV people.
 - d) Environmental pollution-type, causes and preventive measures.
 - e) Role of physical education teacher in pollution and AIDS awareness.

Reference Books

1. Beashel, Paul & Taylor, John : Advance Studies in Physical Education and Sports, Thomas Nelson & Sons Ltd., U.K., 1996.
2. Brown M.C. & Sommer B.K. – Movement Education- Its Evaluation and Modern Approach, Adchison, wesely publication, London, 1978.
3. Crouch James E. – Essential Human Anatomy A Text – Lea & Febriger , Philladelphia, 1980.
4. Desai V., Sequeira, T. – Aids Prevention Education Programme : Workbook For Teachers in Secondary Schools of Mumbai, B.M.C. Public Health Dept., Mumbai, 2001.
5. Dr. Uppal A.K. & Dr. Gautam G.P. : Physical Education and Health, India, 2000.
6. Hay, James G & Reid J.G. – Anatomical and Mechanical Basis of Human Motion, Prentice hall, New Jeresy, 1985.
7. Horne, John, Tomlinson D : Understanding Sports: An Introduction to the Sociological & Cultural Analysis of Sports, E & FN spon, London, 1999.
8. Jenson C.R. & Schultzer G.W. – Applied Kinesiology and Biomechnics, Mc Grow hill book Co. New York, 1984,
9. Lock Hurt and others – Anatomy of the human body, Feber & Feber Oxford University, 1975
10. Murgesh N. – Anatomy, Physiology and Health Education, Sathya, Chinnalapatti, 1990.
11. Pearce Evelyn – Anatomy and Physiology for Nurses, Oxford University, 1975.
12. Rasch & Bruke – Kinesiology and applied Anatomy, Lea Febriger, Philladelphia, 1978.
13. Rasch, Philip J. – Kinesiology and Applied Anatomy, Lea Febriger, Philladelphia, 1989.
14. Shaw, Dhananjay – Biomechanics and Kinesiology of Human Motion, Khel Sahitya Kendra, Delhi, 1998
15. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London, 1994.
16. Wells & Luttgens – Kinesiology – Scientific Bases of Human Motion – 6th Ed., Saunderdas College. , Philladaphia, 1976

17. लेकावळे, व्ही.एल. - शरीर शास्त्र- रचना व कार्य, बार्शी, १९९४.
18. जोशी, विजया - व्यायामाचे शरीर क्रीया शास्त्र, अमित ब्रदर्स, नागपूर, १९९५.
19. वाखारकर, दि.गो. - शरीर विज्ञान व आरोग्य शास्त्र, क्रीडातंत्र, पुणे, १९९२
20. वर्मा, के.के. - शरीर रचना तथा शरीर क्रीया विज्ञान, प्रकाश ब्रदर्स, लुधीयाना, १९८३
21. साठे, विवेक - गतिशास्त्र और स्वास्थ्य शिक्षा, नर्मदा प्रकाशन, नागपूर, १९९५.
22. साठे, विवेक - गतिशास्त्र आणि आरोग्य शिक्षण, नर्मदा प्रकाशन, नागपूर, १९९५.
23. साठे, विवेक - शरीर रचना व कार्य, नर्मदा प्रकाशन, नागपूर, १९९५
24. श्रीवास्तव, अभयकुमार - शरीर व्यायाम क्रीयात्मक विज्ञान एवं चिकीत्सा, सुयोग, अमरावती, १९९४.
25. हिलेकर, श्री.पू. - मानव शरीर रचना एवं क्रीया विज्ञान, श्री हनुमान व्यायाम प्रसारक मंडळ, अमरावती.
26. मलैया और इतर - शरीर क्रीया विज्ञान, विनोद पुस्तक मंदिर, आग्रा, १९९०.
27. गुप्त, मंजू, गुप्त, महेशचंद्र (अनुवादक)- शारीर और शरीरक्रीया विज्ञान, ऑक्सफर्ड युनिव्हर्सिटी प्रेस, दिल्ली, १९८०.

Section - II

Officiating And Coaching

Theory of officiating

Unit I

- a) Meaning and purpose of officiating.
- b) Basic principles of officiating
- c) Duties and responsibilities of officials.
- d) Qualification and qualities of officials.
- e) Professional growth of officials.

Officiating, rules and regulations of the following games and sports.

Unit II

- | | | |
|---------------|---------------|-----------------|
| a) Badminton | b) Basketball | c) Cricket |
| d) Football | e) Handball | f) Hockey |
| g) Kabaddi | h) Kho-Kho | i) Table Tennis |
| j) Volleyball | k) Athletics | |

Theory of Coaching

Unit III

- a) Meaning, purpose and Philosophy of coaching
- b) Principles of coaching and training
- c) Duties and responsibilities of coach
- d) Qualification and qualities of coach
- e) Difference between coaching, teaching and training
- f) Planning and periodisation.

Coaching of individuals and team games :

Unit IV

- a) Fundamental skills
- b) Techniques and tactics.
- c) Lead-up games.
- d) Positional play and system of play
- e) Selection of team
- f) Promoting interest in the games and sports.

Conditioning Exercise for individuals and team games and sports.

Unit V

- a) Warm-up – Meaning, importance and types
- b) Meaning and importance of conditioning exercise
- c) Methods of conditioning exercise
- d) Limbering down exercises.
- e) Training methods

Reference Books

1. Agarwal K.K. and Jain R.R. : Officiating and Coaching, Agarwal & Jain , Delhi, 1983.
2. Anand, R.L. : Playing Field Manual, Sports Authority of India, Patiala, 1986.
3. Anne, Princess : Coach Education : Preparation for a Profession, E & FN Spon, London, 1986.
4. Bhandari, P.K. & Malhotra, G.D. : Training Manual, Badminton, Sports Authority of India, Patiala, 2002.
5. Bose, Tapan & Mukherjee, Bhawani : Training Manual-Table Tennis, SAI, Patiala, 2001.
6. Bunn, Johan. W. : Art of Officiating Sports, Prentice hall, New Jersey, 1968
7. Bunn. W. : Scientific Principles of Coaching, Prentice Hall, New Jersey, 1972.
8. Davis, K.L. : The Art of Sport Officiating, Boston, Allyn and Bacon, 1996.
9. Fuoss, D.E. & Troppmann, R.J. : Effective Coaching, Mac Millan Publication, New York, 1985.
10. Govindarajulu, N. & Gupta, Rakesh : Layout & Marking in Track & Field, Friends Publication, New Delhi, 2004.
11. Gummaerson, Jony : Sports Coaching and Teaching, A & C Black, London, 1992.
12. Mall, Biru & Malhotra, G.P. : Training Manual – Football, SAI, Patiala, 2003.
13. Sabok, Ralph J. : The coach, W.B. Sunderdas Co., Philadelphia, 1979.
14. Sharma, O.P. : Teaching and Coaching Physical Education in School, Sports Publication, Delhi, 1994.
15. Sharma, P.D. : Officiating and Coaching, A.P. Publishers, Jalandhar.
16. Singh, H. & Singh, Tejinder : Training Manual, Hockey, SAI, Patiala, 2002
17. Soni, V. & Sharma, N. : Training Manual-Cricet, SAI, Patiala, 2002.
18. Tayler, Joe : How to be an Effective Coach, Manulife, Canada, 1975.
19. Two Experienced Professors : Officiating and Coaching, Prakash Brothers, Jalandar 1982,
20. Wade, Allen : F.A. Guide to Training and Coaching, Heinmann, London, 1967
21. अरोडा, पी.के. : खेल संचालन एवं प्रशिक्षण, प्रकाश ब्रदर्स, लुधियाना, १९७६.
22. वांगवाड, व्यंकटेश : ऑफिशिएटिंग गेम्स अँड स्पोर्ट्स, पार्वती प्रकाशन, पुणे, १९८२.
23. तिवारी, आर.एच. : ऑफिशिएटिंग एवं कोचिंग, हनुमान व्यायाम प्रसारक मंडळ, अमरावती, १९७६.
24. सिलेदार, परिहार : खेल संचालन व क्रीडामार्गदर्शन, अभय प्रकाशन, नांदेड, १९९३.
25. करमरकर, अ.के. : क्रीडा अधि शिक्षा पद्धती, शक्ती प्रकाशन, अमरावती, १९८३.
26. नाडकर्णी, सुरेश : क्रीडा ज्ञानकोश, २री आवृत्ती, मेहता पब्लिशिंग, पुणे, १९९९.

PAPER - V

TEACHING METHODS

Section – I

Physical Education (Compulsory)

OBJECTIVES :

1. To understand the place of Physical Education in the National curriculum.
2. To acquaint the students with planning, presentation technique and class management of teaching various activities in Physical Education.
3. To acquaint the students with different methods of teaching physical activities.
4. To acquaint the students with the principles of teaching physical activity.
5. To acquaint the students with planning, objectives of different types of lessons.
6. To acquaint the students with organizing and conducting various types of tournaments and athletic meet.
7. To acquaint the students with the constructions and marking of track and field events.

Unit I Curriculum of Physical Education

- a) Place & Importance of Physical Education in the school curriculum
- b) Objectives of Teaching Physical Education at Secondary & Higher Secondary Education
- c) Curriculum of Physical Education for Secondary & Higher Secondary Education in Maharashtra State

Unit II Methods and Techniques of teaching Physical Education

- a) Methods of Teaching - Command, Orientation, Lecture, Demonstration, Discussion, Progressive part method, At-will method, whole-part-whole.
- b) Planning – Personal preparation, technical preparation
- c) Presentation – Steps of presentation
- d) Class management - Principles of class management
- e) Classification of Pupils
- f) Steps in Effective teaching
- g) Principles of teaching

- Unit III Teaching and Planning of various Physical Education activities.**
- a) Teaching of Formal & informal activities, major and minor games, Track and field events, Rhythmic activities, Yoga.
 - b) Objectives of lesson plan
 - c) Types of lesson plan
 - d) Preparation of lesson plan
 - e) Year plan, Unit plan
- Unit IV Teacher of Physical Education**
- a) Qualities, qualifications and professional growth of Physical Education teacher.
 - b) Challenges faced by the Physical Education teacher in the present day context.
- Unit V Organisation of Tournaments/Competitions and Co-curricular activities**
- a) Need & Importance of Tournaments
 - b) Types of Tournaments
 - c) Organisation of Intramural, Extramural and Co-curricular Activities (National days, National Sports days, Hiking, Trekking, Picnic & Camping etc)
- Unit VI Evaluation in Physical Education**
- a) Meaning & Importance of Evaluation
 - b) Methodology of Evaluation (as per school curriculum)
 - c) Preparation and Maintenance of records
 - d) Tools of Evaluation
- Unit VII Information and Communication Technology**
- a) Importance of the information and communication technology
 - b) Computer application in teaching of Physical Education.
 - c) Methods of using Power-Point presentation in teaching of Physical Education.
 - d) Uses of Internet facility in teaching of Physical Education

Reference Books

1. Anand, R.L.: Playing Field Manual, NIS publication, 1986.
2. C. Tirunarayanan and S. Harihara Sarma : Methods in Physical Education, South India press, Karaikudi, 1982
3. Merrill, Paul. F. : Computers in Education, Hammomns, Talman, Christensen, Vincient
4. FLYNN, Meredith & RUTKOSKY, Nita H. : Advanced Microsoft office 2000 , BPB publication. New Delhi , 2000.
5. Greyson, Daughtrey : Methods in Physical Education and Health for Secondary Schools, W.B. Saunder co. Philadelphia and London, 1967.
6. Gupta/Vikas : Comdex computer course –kit , Dreamtech, New Delhi, 2001.
7. Hergert, Douglas A. : Excel for Windows' 95 – Instant Reference , Sybex Incorporated, 1992.
8. Hillman, David : Multimedia Technology and Applications, Delmar Publishers, , New York, 1998.
9. Intel Teach to the Future, National Centre for Software Technology, Mumbai, 2001.
10. Kamlesh, M.L. & Sangral, M.S. : Methods in Physical Education, Prakash Brothers, Educational Publishers, Ludhiana, 1985.
11. Kamlesh, M.L. : Scientific Art of Teaching Physical Education, Metropolitan New Delhi, 1994.
12. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing , New Delhi, 2001.
13. Phadke, Moghe. : Notes for computer course , Vol. I, II, III, IV, Utility Creations, Pune, 1996 to 1998.
14. Rajaraman : Computer Primer, Ed. 2, , Prentice hall of India pvt. Ltd. New Delhi
15. Rathbone, Andy : Windows 98 for Dummies for 2nd Ed., (IDG, Books Worldwide), Comdex Computer publication, New Delhi, 1997.
16. Sanders, Donald H.: Computers Today , McGraw Hill Book Co. , New York , 1988.
17. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London, 1994.
18. Sinha, P.K. : Computer Fundamentals : Concepts, Systems and Applications, BPB publications, New Delhi, 1992.
19. Timothy J.O. Leavy and Linda : Microsoft office , 2000
20. Underdahl, Brian & Underdahl, keith : Internet with Web page/ Web Site Design Bible, IDG Books India (P) Ltd., New Delhi :, 2000.
21. Wesson, Kevin, Wiggins, N. : Sports and Physical Education : A Complete Guide to Advanced Level Study Hodder & Stoughton, , London, 1998.

22. पाण्डेय, लक्ष्मीकान्त : शारीरिक शिक्षा की शिक्षण पद्धती, मेट्रोपोलिटन बुक कम्पनी प्रा.लि. नवी दिल्ली, १९७७
23. कवीश्वर, दीपक प्र. : शारीरिक शिक्षा की पद्धतियाँ, एस.एम. पब्लिश, नागपूर.
24. कौशिक, सीमा, शॉ, धनंजय - शारीरिक शिक्षा के पाठ-नियोजन व शिक्षण पद्धती के सिद्धांत, फेंडस् पब्लिकेशन-इंडिया, दिल्ली, २०००.
25. शिंदे, स.के. : शारीरिक शिक्षण अध्यापन पद्धती, मंदार ट्रेडर्स, पुणे, १९९४.
26. असनारे, मुकुंद : शिक्षण तथा शारीरिक शिक्षण अध्यापन पद्धती, असणारे प्रकाशन, अमरावती, १९८९.
27. कमलेश, एम.एल., संग्राल, एम.एस. : शारीरिक शिक्षामें शिक्षण विधियां, प्रकाश ब्रदर्स, एज्युकेशनल पब्लिशर्स, लूधियाना, १९८४.
28. पसरीजा, मीनू - शारीरिक शिक्षा की विधियाँ, स्पोर्ट्स पब्लिकेशन्स, नई दिल्ली, २००४.

SECTION - II
SPECIAL METHODS
LANGUAGES (MARATHI, ENGLISH, HINDI)

Objectives :

1. To understand the importance of language as a subject and in life.
2. To understand the Psychology of the language teaching
3. To acquire knowledge of the approaches of language teaching.
4. To understand the methods and techniques of teaching various aspects of language teaching.
5. To acquire knowledge of pedagogical analysis of various concepts of different aspects of language teaching.
6. To develop language competencies.
7. To acquire knowledge of effective use of instructional material.
8. To develop an awareness of the role of a teacher.

Unit I

Understanding the role of language

- a) Importance in life as a medium of development
 - i) Intellectual
 - ii) Emotional
 - iii) Social
 - iv) Cultural
 - v) Literary
- b)
 - i) As a subject in the Secondary and Higher Secondary Syllabus.
 - ii) Importance of language for non-mother tongue speaking students.
- c) Objectives of teaching language at Higher/Lower level.
- d) Correlation – Internal and External with other school subjects.

Unit II

Teaching of language

- a) Psychology of learning
- b) Maxims and Principles of language teaching.
- c) Approaches –
 - i) Grammar – translation
 - ii) Audio-lingual
 - iii) Direct
 - iv) Structural (English only)
 - v) Communicative (English only)

Unit III Aspects of language teaching

- a) Prose
 - i) Techniques – Discussion, Narration, Questioning
 - ii) Methods – Story – telling, Dramatization, Simulation.
 - iii) Methods of teaching Reading – Alphabetic, Phonetic.
 - iv) Types of Reading – Intensive, Extensive, Supplementary
- b) Poetry
 - i) Methods – Recitation, Song/Action, Dramatization, Discussion, Appreciation.
- c) Grammar
 - i) Methods – Inductive & Deductive, Playway interactive.
 - ii) Types – Functional & Formal
- d) Composition
 - i) Types – Guided, Free, Creative
 - ii) Correction of Composition.

Unit IV Pedagogical Analysis

In relation to core elements as given in NEP 1986

(On any topics from prose, poetry, grammar and composition)

- i) Unit-analysis
- ii) Instructional objectives and specifications
- iii) Activities and Procedures
- iv) Evaluation techniques

Unit V Strategies for developing language competencies

- a) Developing basic competencies
 - i) Listening – pronunciation, expression, phonetic stress & intonation
 - ii) Speaking – conversation, drill
 - iii) Reading – loud, silent, chorus, expressive, speed.
 - iv) Writing – hand writing skills, poetic & non-poetic
- b) Language Practice –Assignments, games, competitions, club.
- c) Use of multiple intelligence in language teaching.

Unit VI Materials of instruction for language teaching

- a) Use of technology
 - i) O.H.P. Video, tape-recorder
- b) Use of Media
 - i) T.V.
 - ii) News paper, Advertisements.
- c) Use of Library
 - i) Koshas, Dictionaries.

- Unit VII Teacher and text book**
- a) Teacher
 - i) Qualities
 - ii) Roles and responsibilities
 - iii) Professional growth
 - iv) Diagnostic testing and remedial teaching
 - b) Text book
 - i) Characteristics of a text book
 - ii) Critical analysis of a text book (V to XII std.)

- Unit VIII Information and Communication Technology.**
- a) Importance of the information and communication technology
 - b) Computer application in teaching of languages.
 - c) Methods of using Power-Point presentation in teaching of languages.
 - d) Uses of Internet facility in teaching of languages.

Reference Books (English Method)

1. Bhatia, K. & Bhatia, B.D. : The Principles and Methods of Teaching, Doba house, New Delhi, 1972.
2. Bhatia, K.K. : New Techniques of Teaching English as a Foreign language - 8th Ed., New Academic Pub. Co., Jullundur, 1981.
3. Bisht, Abha Rani : Teaching English in India-4th Ed., Vonod Pustak Mandir, Agra, 1991.
4. Flynn, Meredith & Rutkosky, Nita H. : Advanced Microsoft office 2000, BPB publication. New Delhi, 2000.
5. Gupta/Vikas : Comdex computer course -kit , Dreamtech, New Delhi, 2001.
6. Gurav H.K. : Teaching English, Nootan Prakashan, Pune, 1991.
7. Hergert, Douglas A. : Excel for Windows' 95 Instant Reference, Sybex Incorporated. 1992.
8. Hillman, David : Multimedia Technology and Applications, Delmar Publishers. New York, 1998.
9. Intel Teach to the Future, National Centre for Software Technology, Mumbai.
10. Jain, R.K. : Essentials in English Teaching, Vinod Pustak Mandir, Agra, 1988
11. Kohil, A.L. : Techniques of Teaching English, 9th Ed., Dhanpal Rai & Sons, Delhi, 1992.
12. Menon, T.K.N. & Patel, M.S. : Teaching of English as a Foreign Language, Acharya Book Depot, Baroda, 1974.
13. Merrill, Paul F., Hammomns, Talman, Christensen, Vincient : Computers in Education.
14. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing, New Delhi, 2001.

15. Phadke, Moghe : Notes for computer course , Vol. I, II, III & IV, Utility Creations, Pune.
16. Rajaraman, : Computer Primer : Ed. 2, Prentice hall of India pvt. Ltd. New Delhi.
17. Rathbone, Andy : Windows for Dummies , IInd ed. ,Comdex Computer Publications, New Delhi, 1997.
18. Sachdeva, M.S. : A New Approach to Teaching of English in India, 9th Ed, Prakash Brothers, Ludhiana, 1983.
19. Sanders, Donald H. : Computers Today, McGraw Hill Book Co., New York ,1988.
20. Sinha, P.K. : Computer Fundamentals: Concepts, Systems and Applications, BPB publications, New Delhi, 1992.
21. Thompson to Wyatt H.G. : Teaching of English in India, University of London.
22. Underdahl, Brian & Underdahl : Internet with Web page/ Web Site Design Bible, Keith, IDG Books India (P) Ltd. New Delhi, 2000.
23. Verghese, Paul : Teaching of English as a Second Language, Sterling Pub.Pvt.Ltd., Delhi, 1989.
24. Yoakum G.A. & Simpson R.G. : Modern Methods & Techniques of Teaching

रेफरन्स - मराठी

१. अकोलकर, ग.वि., पाटणकर ना.वि. : मराठीचे अध्यापन व्हीनस प्रकाशन, पुणे, १९७०.
२. कुंडले, म.बा. : मराठीचे अध्यापन, श्री विद्या प्रकाशन, पुणे, १९७४.
३. डांगे, चंद्रकुमार : मातृभाषेचे अध्यापन, चित्रशाला, प्रकाशन, पुणे, १९५३.
४. पाटील, लिला : मातृभाषेचे अध्यापन व मूल्यमापन, व्हीनस प्रकाशन, पुणे, १९६४.
५. करंदीकर, सुरेश : मराठीचे अध्यापन, फडके प्रकाशन, कोल्हापूर, १९९६.
६. जोशी, शैलजा : मराठी कवितेचे अध्यापन, नूतन प्रकाशन, पुणे, १८८९.
७. दुनाखे, अ.र. : मराठीचे अध्यापन, नूतन प्रकाशन, पुणे, २०००.
८. फडके, वासंती : अध्यापनाची प्रतिमाने, नूतन प्रकाशन, पुणे, १९८८.
९. वाळंबे, मो.रा. : सुगम मराठी व्याकरण लेखन, नितीन प्रकाशन, पुणे, २००१.

संदर्भ- हिन्दी

१. थर्याणी, डी.के. : भाषा की शिक्षा, Teacher Education Information services, Bombay, 1997.
२. भाटिया और नारंग : हिन्दी भाषा शिक्षण, प्रकाश ब्रदर्स, लुधियाना, १९८४.
३. योगेन्द्र जीत : कक्षा अध्यापन, पाठ संकेत निर्माण एवं विशिष्ट विधियाँ
४. योगेन्द्रजित : हिन्दी भाषा शिक्षण उन्नीसवॉ संस्करण - विनोद पुस्तक मंदिर, आग्रा, १९८९.
५. शर्मा, लक्ष्मीनारायण : भाषा १,२ की शिक्षण विधियों और पाठ नियोजन-तृतीय संस्करण, विनोद पुस्तक मंदिर, आगरा, १९८८.
६. केणी, कुलकर्णी : हिन्दी की अध्यापन पद्धति-तृतीय संस्करण, व्हीनस प्रकाशन, पुणे, १९९२.
७. भारद्वाज, दिनेशचंद्र : हिन्दी भाषा शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९९२.

HISTORY METHOD

Objectives :

1. To understand the significance of history in school curriculum
2. To understand the methods of teaching history.
3. To understand the principles and organization of curriculum construction.
4. To acquire knowledge of pedagogical analysis of various concepts in history.
5. To understand critical analysis of textbook
6. To understand the importance of co-curricular activities in the teaching of history.
7. To develop skills in the preparation and use of instructional materials.
8. To understand the role of history teacher in the present context.

Unit I **Place of history in school curriculum and life**

- a) Concept of history
- b) Place and importance of teaching the subject.
- c) Objectives of teaching at secondary and higher secondary levels of education.

Unit II **Methods of teaching**

- a) Story telling
- b) Lecture cum discussion
- c) Dramatization and role play
- d) Project
- e) Discussion
- f) Self study, assignments, supervised study.
- g) Source method
- h) Social inquiry method.

Unit III **Pedagogical Analysis : In relation to core elements as given in NEP 1986.**

- a) Unit analysis
- b) Instructional objectives and specifications
- c) Activities and procedures.
- d) Evaluation techniques

Unit IV **Enhancing the teaching of the subject**

- a) Maxims of teaching – known to unknown, simple to complex, concrete to abstract.
- b) Correlation with other school subjects-Geography, Literature, Science, Mathematics, Craft.

Unit V Curriculum and textbooks

- a) Organization of subject matter in history – Concentric approach and regressive approach.
- b) Characteristics of a good textbook
- c) Critical analysis of a textbook (Std. V to XII)
- d) Importance and organization of co-curricular activities – clubs, visits, museums
celebration of days of national importance and festivals.

Unit VI Equipment and Facilities

- a) Instructional materials and teaching aids :
 - i) Visual: C.B., Charts, Pictures, Graphs, Maps, Globes, Objects, Models, Specimens and Flannel Board.
 - ii) Auditory : Radio, Tape Recorder.
 - iii) Audio-Visual : Television, Motion Pictures, Filmstrips, Films.
 - iv) Miscellaneous : Booklets, Newspapers, Magazines.
- b) History room – Need, equipments, maintenance.

Unit VII The role of the teacher

- a) Qualities and qualifications,
- b) Professional growth
- c) Challenges faced by the history teacher in the present day context.
- d) Diagnostic testing and remedial teaching.

Unit VIII Information and Communication Technology .

- a) Importance of the information and communication technology
- b) Computer application in teaching of History.
- c) Methods of using Power-Point presentation in teaching of History.
- d) Uses of Internet facility in teaching of History.

Reference Books

1. Arora, K.L. : Teaching of History, Prakash Brothers, Ludhiana, 1983.
2. Flynn, Meredith & Rutkosky, Nita H. : Advanced Microsoft office 2000, BPB publication. New Delhi, 2000..
3. Gupta/Vikas : Comdex computer course –kit , Dreamtech, New Delhi, 2001.
4. Hergert, Douglas A. : Excel for Windows' 95 Instant Reference, Sybex Incorporated. 1992.
5. Hillman, David : Multimedia Technology and Applications, Delmar Publishers. New York, 1998.
6. Intel Teach to the Future, National Centre for Software Technology, Mumbai.
7. Merrill, Paul F., Hammomns, Talman, Christensen, Vincient : Computers in Education.

8. Kochhar, S.K. : Teaching of History-2nd Ed., Sterling Publishers pvt. Ltd., Delhi, 1980.
9. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing, New Delhi, 2001.
10. Phadke, Moghe : Notes for computer course , Vol. I, II, III & IV, Utility Creations, Pune.
11. Rajaraman, : Computer Primer : Ed. 2, Prentice hall of India pvt. Ltd. New Delhi.
12. Rathbone, Andy : Windows for Dummies , IInd ed. , Comdex Computer Publications, New Delhi, 1997.
13. Sanders, Donald H. : Computers Today, McGraw Hill Book Co., New York ,1988.
14. Sinha, P.K. : Computer Fundamentals: Concepts, Systems and Applications, BPB publications, New Delhi, 1992.
15. Timothy J.O. Leavy and Linda : Microsoft office 2000.
16. Underdahl, Brian & Underdahl : Internet with Web page/ Web Site Design Bible, Keith, IDG Books India (P) Ltd. New Delhi, 2000.
17. Vrajeshwari, R. : Handbook for History Teachers-2nd Ed., Allied Publishers, Bombay, 1973.
18. चितळे / मांडके : इतिहास कसा शिकवावा? ४थी आवृत्ती, पुणे विद्यार्थी गृह प्रकाशन, पुणे - १९७१.
१९. चितळे : इतिहास कसा शिकवावा? ३री आवृत्ती, आखिल विद्यार्थी गृह प्रकाशन, पुणे, १९५९.
२०. पत्की श्री.मा. : इतिहास अध्यापन पद्धती व तंत्र, मिलिंद प्रकाशन, औरंगाबाद, १९८०.
२१. धारूरकर / पारसनीस : इतिहासाचे अध्यापन, २री आवृत्ती, व्हीनस प्रकाशन, पुणे, १९८६.
२२. तिवारी सी.ग. : इतिहास अध्यापन पद्धती, नूतन प्रकाशन, पुणे, १९८७.
२३. दुनाखे अरविन्द : इतिहासाचे अध्यापन
२४. निरंतर ग.भा. : इतिहास अध्यापन पद्धती
२५. सतसंगी,जी.डी. : इतिहास शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९९०.

GEOGRAPHY METHOD

Objectives :

1. To understand the nature, scope and significance of teaching geography.
2. To understand the aims of teaching geography at the secondary level.
3. To develop an understanding of methods of teaching geography.
4. To acquire skills in preparation and use of various instructional materials.
5. To acquire knowledge of pedagogical analysis of various concepts in geography.
6. To critically analyze the text book of geography.
7. To understand the principles and approaches of arranging the course content.
8. To understand the importance of co-curricular activities in the teaching of geography.
9. To understand the role of geography teacher in the present context.

Unit I Place of geography in the curriculum and life

- a) Nature and scope of geography.
- b) Aims of teaching geography
 - i) Practical
 - ii) Social and cultural
 - iii) Economic
 - iv) National integration
 - v) International understanding

Unit II Methods of teaching

- Importance, procedures, advantages and limitations of following methods-
- a) Project
 - b) Journey
 - c) Regional
 - d) Self study
 - e) Demonstration
 - f) Discussion
 - g) Comparative

Unit III Pedagogical analysis – In relation to core elements as given NEP 1986

- a) Unit analysis
- b) Instructional objectives and specifications.
- c) Activities and procedures.
- d) Evaluation techniques.

Unit IV Enhancing the teaching of the subject

- a) Maxims of teaching :
Known to unknown, simple to complex, concrete to abstract, particular to general, Psychological to logical, analysis to synthesis, empirical to rational,
- b) Co-relation with other school subjects- history, literature, science, mathematics, craft

Unit V Curriculum and text books

- a) Organization of content as the basis of concentric and regressive approach – its advantages and limitations.
- b) Characteristics of a textbooks
Critical analysis of a textbook (std. V-XII)
- c) Importance and organization of co-curricular activities : clubs, visits, museums, festivals, celebration of days of national importance, current events in geography education.

Unit VI Role of teacher

- a) Qualities and qualifications.
- b) Professional growth
- c) Role of teachers organization
- d) Responsibilities of teacher
- e) Diagnostic testing and remedial teaching

Unit VII Facilities and equipments

- a) Instructional materials and teaching aids :
 - i) Visual : C.B., Charts, Pictures, Graphs, Maps, Globes, Objects, Models, Specimens and Flannel Board.
 - ii) Auditory : Radio, Recorders.
 - iii) Audio-Visual : Television, Motion Pictures, Filmstrips, Films.
 - iv) Miscellaneous : Booklets, Newspapers, Magazines.
- b) Geography room
 - i) Need, equipments, maintenance
- c) Planetorium

Unit VIII Information and Communication Technology.

- a) Importance of the information and communication technology
- b) Computer application in teaching of Geography.
- c) Methods of using Power-Point presentation in teaching of Geography.
- d) Uses of Internet facility in teaching of Geography.

Reference Books

1. Bhatia, B.D. & Bhatia, Kamala : Principles and Methods of Teaching, Doaba House Delhi, 1972.
2. Flynn, Meredith & Rutkosky, Nita H. : Advanced Microsoft office 2000, BPB publication New Delhi, 2000.
3. Gupta/Vikas : Comdex computer course –kit , Dreamtech, New Delhi, 2001.
4. Hergert, Douglas A. : Excel for Windows' 95 Instant Reference, Sybex Incorporated 1992.
5. Hillman, David : Multimedia Technology and Applications, Delmar Publishers. New York, 1998.
6. Intel Teach to the Future, National Centre for Software Technology, Mumbai.
7. Merrill, Paul F., Hammomns, Talman, Christensen, Vincient : Computers in Education.
8. N.C.E.R.T. : Teaching of Geography and National Integration
9. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing, New Delhi, 2001.
10. Phadke, Moghe : Notes for computer course , Vol. I, II, III & IV, Utility Creations, Pune.
11. Rajaraman, : Computer Primer : Ed. 2, Prentice hall of India pvt. Ltd. New Delhi.
12. Rathbone, Andy : Windows for Dummies , IInd ed. ,Comdex Computer Publications New Delhi, 1997.
13. Sanders, Donald H. : Computers Today, McGraw Hill Book Co., New York , 1988.
14. Sinha, P.K. : Computer Fundamentals: Concepts, Systems and Applications, BPE publications, New Delhi, 1992.
15. Timothy J.O. Leavy and Linda : Microsoft office 2000.
16. U.N.E.S.C.O. : UNESCO Source Book for Geography
17. Underdahl, Brian & Underdahl : Internet with Web page/ Web Site Design Bible, Keith IDG Books India (P) Ltd. New Delhi, 2000.
18. Varma, O.P. & Vedanayagam : Geography Teaching, 4th Ed, Sterling Publishers Pvt Ltd, Bangalore, 1991.
19. पाटणकर, ना.वि. : भूगोलाचे अध्यापन, ९वी आवृत्ती, मॉडर्न बुक डेपो प्रकाशन, पुणे, १९७७.
20. पोंक्षे, द.बा. : भूगोलाचे अध्यापन, नुतन प्रकाशन, पुणे, १९७८.
21. बापट, भा.गो. : भूगोलाचे अध्यापन आणि अध्ययन, २री आवृत्ती, व्हीनस प्रकाशन, पुणे, १९८१.
22. सांगळे, शैलजा : स्पेशल मेथड भूगोल, नुतन प्रकाशन, पुणे, १९८३.
23. सिंह, एच्.एन्. : भूगोल शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९८९.
24. भारद्वाज, दिनेशचंद्र : भूगोल शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९९१.

SCIENCE METHOD

Objectives :

1. To understand the place of science in the national curriculum
2. To develop skills and competencies in teaching science at different stages.
3. To understand the challenges faced while teaching science
4. To acquire knowledge of pedagogical analysis of various concepts in science
5. To critically analyze the text book of science
6. To understand the principles and approaches of arranging the course content.
7. To understand the importance of co-curricular activities in the teaching of science
8. To prepare and use different types of instructional materials in the teaching of science
9. To understand and develop skills in the use of innovative techniques in science.

Unit I Place in the curriculum

- a) Meaning and importance in the curriculum and in life.
- b) Place of science w.r.t. the commissions and policies.
- c) Correlation with the curriculum-Internal & External, other subjects & life.

Unit II Approaches to teaching

- a) Maxims of teaching
 - i) Simple to complex
 - ii) Whole to part
 - iii) Empirical to rational
 - iv) Concrete to abstract
 - v) Known to unknown
 - vi) Particular to general
- b) Methods of teaching
 - i) Lecture cum demonstration
 - ii) Laboratory
 - iii) Project
 - iv) Problem solving
 - v) Inducto-deductive
 - vi) Analytic method
 - vii) Heuristic

Unit III Pedagogical Analysis In relation to core elements as given in NEP 1986

- a) Unit analysis
- b) Instructional objectives and specifications.
- c) Activities and procedures
- d) Evaluation techniques

Unit IV Curriculum

- a) Organization of the content on the basis of concentric and topical approach.
- b) Subject co-curricular activities
 - i) Importance and organization of C.C.A. – clubs, forums, games, quiz environmental ramble, exhibitions, visits and excursions.
 - ii) Planning, preparation, maintenance and importance of
 - Science rooms-Laboratory (layout and equipment, including improvised apparatus)
 - Museums (Including herbarium, terrarium, specimens aquarium)
 - Science Centres – Botanical gardens and parks

Unit V Instructional materials

- a) Importance and use of teaching aids
 - i) Visual projected aids-slides, film strips, transparencies
 - ii) Audio-Radio, Tape-recorder
 - iii) Audio-Visual-TV, Video, Film projector
 - iv) Non-Projected – charts, models
- b) Print materials
 - i) Text books
 - Importance and use
 - Criteria of a good science textbook
 - Critical analysis of a science textbook (V to XII)
 - ii) Journals, preparation, maintenance and updating.
 - iii) Reference materials – Encyclopedia, newsletters, magazines, electronic media.

Unit VI Innovations in Science teaching

- a) Use of computers in science
 - i) Preparation of instructional material for science teaching
 - C.D. and multimedia packages.
 - ii) Use of internet
 - For referencing and exchange of instructional material
 - Upgrading of knowledge base
- b) Use of
 - i) Mobile laboratories
 - ii) Planetarium
 - iii) Scientific toys (in context to rural settings)
- c) Developing global perspectives in science teaching.

Unit VII Role of the subject teacher

- a) Qualities and qualifications.
- b) Professional growth
- c) Challenges faced by the science teacher in the present day context
- d) Diagnostic testing and remedial teaching.

Unit VIII Information and Communication Technology.

- a) Importance of the information and communication technology
- b) Computer application in teaching of Science.
- c) Methods of using Power-Point presentation in teaching of Science.
- d) Uses of Internet facility in teaching of Science.

Reference Books

1. Flynn, Meredith & Rutkosky, Nita H. : Advanced Microsoft office 2000, BPB publication. New Delhi, 2000.
2. Gupta/Vikas : Comdex computer course –kit , Dreamtech, New Delhi, 2001.
3. Hergert, Douglas A. : Excel for Windows' 95 Instant Reference, Sybex Incorporated. 1992.
4. Hillman, David : Multimedia Technology and Applications, Delmar Publishers. New York, 1998.
5. Intel Teach to the Future, National Centre for Software Technology, Mumbai.
6. Mangal S.K.: Fundamentals of Educational Technology, Prakash Brother, Ludhiana, 1985.
7. Merrill, Paul F., Hammomns, Talman, Christensen, Vincient : Computers in Education.
8. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing, New Delhi, 2001.
9. Phadke, Moghe : Notes for computer course , Vol. I, II, III & IV, Utility Creations, Pune.
10. Rajaraman, : Computer Primer : Ed. 2, Prentice hall of India pvt. Ltd. New Delhi.
11. Rao, Usha : Educational Technology, Himalaya Publication House, Bombay, 1991.
12. Rathbone, Andy : Windows for Dummies , IInd. ed. ,Comdex Computer Publications, New Delhi, 1997.
13. Sanders, Donald H. : Computers Today, McGraw Hill Book Co., New York , 1988.
14. Sharma, R.C. : Modern Science Teaching, Dhanpal Rai & Sons, Delhi, 1975.
15. Siddiqui & Siddiqui M.N. : Teaching of Science – Today and Tomorrow
16. Sinha, P.K. : Computer Fundamentals: Concepts, Systems and Applications, BPB publications, New Delhi, 1992.
17. Timothy J.O. Leavy and Linda : Microsoft office 2000.
18. Underdahl, Brian & Underdahl : Internet with Web page/ Web Site Design Bible, Keith, IDG Books India (P) Ltd. New Delhi, 2000.
19. अनारसे, दिघे, पाटणकर : शास्त्राचे अध्यापन, व्हीनस प्रकाशन, पुणे, १९७४.
20. सोहोनी, गो.प्र. : शास्त्र कसे शिकवावे, नीलकंठ प्रकाशन, पुणे, १९६३.
21. कदम, बोदार्डे : शास्त्र अध्यापन पद्धती २री आवृत्ती, नुतन प्रकाशन, पुणे, १९९३.
22. शर्मा, डी.सी. : विज्ञान शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९९०.
23. अग्रवाल, एम्.बी., रावत, एम्.एस्. : नवीन विज्ञान शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९८९.

MATHEMATICS METHOD

Objectives :

1. To understand the importance of Mathematics in the curriculum
2. To develop skills and competencies in teaching Mathematics at different stages.
3. To understand the challenges faced while teaching mathematics
4. To acquire knowledge of pedagogical analysis of various concepts in mathematics
5. To critically analyze the text book of mathematics
6. To understand the principles and approaches of arranging the course content
7. To understand the importance of co-curricular activities in the teaching of mathematics
8. To prepare and use different types of instructional materials in the teaching of mathematics
9. To understand and develop skills in the use of innovative techniques in mathematics.

Unit I

Nature of mathematics

- a) Meaning and nature of mathematics
- b) Contribution of 4 mathematicians : Aryabhatta, Ramanujan, Euclid & Pythagoras
- c) Importance of mathematics in curriculum
- d) Co-relation of mathematics – internal, external.

Unit II

Pedagogical Analysis : In relation to core elements as given in NEP 1986

- a) Unit analysis
- b) Instructional objectives and specifications.
- c) Evaluation techniques

Unit III

Approaches to teaching of mathematics

- a) Maxims of teaching mathematics
 - i) From known to unknown
 - ii) From simple to complex
 - iii) From particular to general
 - iv) From concrete to abstract
 - v) From whole to part
- b) Methods/Techniques of teaching mathematics
 - i) Inductive-Deductive
 - ii) Analytic-Synthetic
 - iii) Problem solving

- iv) Programmed learning
- v) Drill
- vi) Assignment
- vii) Graded presentation

Unit IV Role of the subject Teacher

- a) Qualities and qualifications
- b) Professional growth
- c) Difficulties faced by teacher and suggestive measure to overcome them
- d) Diagnostic testing and remedial teaching.

Unit V Instructional Material : Types, importance, uses with special reference to following visual aids.

- a) Projected aids – Slides and transparencies
- b) Non-Projected – Charts, models, boards.
- c) Audio-Visual – T.V. Video

Unit VI Curriculum and Text book of Mathematics

- a) Organization of content on the basis of topical and concentric approaches
- b) Characteristics of a good text book of mathematics
- c) Evaluation of text book of (V to XII)

Unit VII Co-Curricular activities in mathematics – Recreational mathematics

- a) Games, quiz, puzzles, visits, talks
- b) Organization and importance of mathematics club.

Unit VIII Information and Communication Technology.

- a) Importance of the information and communication technology
- b) Computer application in teaching of Mathematics.
- c) Methods of using Power-Point presentation in teaching of Mathematics.
- d) Uses of Internet facility in teaching of Mathematics.

Reference Books

1. Brueckner, L.J. et al : Developing Mathematical Understanding in the Upper grades.
2. Ediger, Marlow & Rao, Digumarti Bhaskara : Teaching Mathematics Successfully, New Delhi, Discovery, 2000.
3. Flynn, Meredith & Rutkosky, Nita H. : Advanced Microsoft office 2000, BPB publication. New Delhi, 2000.
4. Gupta, Vikas : Comdex computer course –kit , Dreamtech, New Delhi, 2001.

5. Haggarty, Linda : New Idas for Teacher Education : A Mathmatics Framework, London cassell, 1995
6. Hergert, Douglas A. : Excel for Windows' 95 Instant Reference, Sybex Incorporated. 1992.
7. Hillman, David : Multimedia Technology and Applications, Delmar Publishers. New York, 1998.
8. Intel Teach to the Future, National Centre for Software Technology, Mumbai.
9. James, E.L. & Narasimahachari, R. : Teaching of Mathematics in Secondary schools.
10. Mangal, S.K. : .A Text Book on Teaching Mathematics, Ludhiana : Tondon, Prakash Brothers.
11. Merrill, Paul F., Hammomns, Talman, Christensen, Vincient : Computers in Education.
12. Nagpal, D.P. : Computer Fundamentals, Wheeler publishing, New Delhi, 2001.
13. Phadke, Moghe : Notes for computer course , Vol. I, II, III & IV, Utility Creations, Pune.
14. Rathbone, Andy : Windows for Dummies , lInd ed. ,Comdex Computer Publications, New Delhi, 1997.
15. Sanders, Donald-H. : Computers Today, McGraw Hill Book Co., New York ,1988.
16. Siddhu, Kulbir Singh : The Teaching of Mathematics, New Delhi, Sterling, 1995.
17. Sinha, P.K. : Computer Fundamentals: Concepts, Systems and Applications, RPB publications, New Delhi, 1992.
18. Timothy J.O. Leavy and Linda : Microsoft office 2000.
19. Underdahl, Brian & Underdahl : Internet with Web page/ Web Site Design Bible, keith, IDG Books India (P) Ltd. New Delhi, 2000.
20. Wadhwa, Shalini : Modern Methods of Teaching Mathematics, New Delhi, Sarup, 2000.
21. Wilder, Sue Johnston Secondary : Learning to tech Mathematics in the school, London : Routledge, 1998.
22. ओक, राऊळ : गणित अध्यापन, नुतन प्रकाशन, पुणे, १९९१.
23. जगताप, ह.ना. : गणित अध्यापन, ३री आवृत्ती, नुतन प्रकाशन, पुणे, १९९०.
24. देशमुख, व.पा. : गणिताचे अध्यापन, ५वी आवृत्ती, मॉर्डन बुक डेपो प्रकाशन, पुणे, १९७२.
25. सतसंगी, जी.डी. : गणित अध्यापन, विनोद पुस्तक मंदिर, आगरा, १९९२.
26. रावत, एम्.एस्., अग्रवाल, एम्.बी. : गणित शिक्षण, विनोद पुस्तक मंदिर, आगरा, १९९०.