

GVN 10/04/2008,16/05/2008 ,20/05/08.09/07/08.10/07/08

**Revised Ordinance Governing
Bachelor of Dental Surgery (B.D.S.) Degree Course
2008**



**Rajiv Gandhi University of Health Sciences, Karnataka
4th 'T' Block, Jayanagar, Bangalore - 560 041**

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore
The Emblem



The Emblem of the Rajiv Gandhi University of Health Sciences is a symbolic expression of the confluence of both Eastern and Western Health Sciences. A central wand with entwined snakes symbolises Greek and Roman Gods of Health called Hermis and Mercury is adapted as symbol of modern medical science. The pot above depicts Amrutha Kalasham of Dhanvanthri the father of all Health Sciences. The wings above it depicts Human Soul called Hamsa (Swan) in Indian philosophy. The rising Sun at the top symbolises knowledge and enlightenment. The two twigs of leaves in western philosophy symbolises Olive branches, which is an expression of Peace, Love and Harmony. In Hindu Philosophy it depicts the Vanaspathi (also called as Oushadi) held in the hands of Dhanvanthri, which are the source of all Medicines. The lamp at the bottom depicts human energy (kundalini). The script “Devahitham Yadayahu” inside the lamp is taken from Upanishath Shanthi Manthram (Bhadram Karnebhi Shrunuyanadev...), which says “**May we live the full span of our lives allotted by God in perfect health**” which is the motto of the Rajiv Gandhi University of Health Sciences.

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

Vision Statement

The Rajiv Gandhi University of Health Sciences, Karnataka, aims at bringing about a confluence of both Eastern and Western Health Sciences to enable the humankind “Live the full span of our lives allotted by God in Perfect Health”

It would strive for achievement of academic excellence by Educating and Training Health Professionals who

- ❖ **Shall recognize health needs of community,**
- ❖ **Carry out professional obligations Ethically and Equitably and in keeping with National Health Policy,**

It would promote development of scientific temper and Health Sciences Research.

It would encourage inculcation of Social Accountability amongst students, teachers and Institutions.

It would Support Quality Assurance for all its educational programmes.

Motto

Right for Rightful Health Sciences Education

Notification

Rajiv Gandhi University of Health Sciences, Karnataka, Bangalore

CONTENTS

Table of Contents		Page
	Emblem	2
	Vision Statement	3
	Notification	4
Section I	Goals of Education and Training in Dental Science of RGUHS.	6
Section II	Aims and Objectives of BDS Course	7 to 8
Section III	Regulations relating to B.D.S. Course	9 to 22
Section IV	Course of study (Syllabus) and Scheme of Examination	23
I BDS	1. General Human Anatomy including Embryology, Osteology and Histology	23 to 28
	2. a) General Human Physiology, and	29 to 35
	2. b) Biochemistry, Nutrition and Dietics	36 to 41
	3. Human Oral and Dental Anatomy, Embryology, Physiology and Histology	42 to 46
	4. Dental Materials	47 to 48
	5. Pre-clinical Prosthodontics & Crown & Bridge	49
II BDS	1. a) General Pathology and	50 to 54
	1. b) Microbiology	55 to 62
	2. General and Dental Pharmacology and Therapeutics	63 to 67
	3. Dental Materials	68 to 70
	4. Pre-clinical Conservative Dentistry	71 to 73
	5. Pre-clinical Prosthodontics & Crown & Bridge	74 to 77
	6. Oral Pathology & Oral Microbiology	78 to 80

Section I

Goals of Education and Training in Dental Science of Rajiv Gandhi University of Health Sciences, Karnataka.

The Dental curriculum shall be oriented towards educating students of B.D.S. Course to:

1. Take up the responsibilities of dental surgeon of first contact and be capable of functioning independently in both urban and rural environment.
2. Provide educational experience that allows hands-on-experience both in hospital as well as in community setting.
3. Make maximum efforts to encourage integrated teaching and de-emphasize compartmentalisation of disciplines so as to achieve horizontal and vertical integration in different phases.
4. Offer educational experience that emphasizes health rather than only disease.
5. Teach common problems of health and disease and to the national programmes.
6. Use learner oriented methods, which would encourage clarity of expression, independence of judgement, scientific habits, problem solving abilities, self initiated and self-directed learning.
7. Use of active methods of learning such as group discussions, seminars, role play, field visits, demonstrations, peer interactions etc., which would enable students to develop personality, communication skills and other qualities which are necessary may be done.

Regular periodic assessment be done throughout the course. Examinations be designed with a view to assess not merely the knowledge but also practical and clinical skills, habits and values which are necessary for a graduate to carry out professional day to day work competently.

Towards achieving these goals every Dental College should:

- Evolve institutional objectives, which would be in consonance with the national goals and health policy. The institutional objectives should describe the attributes of their product.
- Shift the role of Dental teachers from merely imparting knowledge to that of a facilitator and motivator of student learning.
- Establish a Dental Education Unit for faculty development, preparation of learning resource materials and for improving evaluation methods.

Section II

Aims and Objectives of BDS Course

Aims

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate should also understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

Objectives

The objectives are dealt under three headings namely (a) knowledge and understanding (b) skills and (c) attitudes.

(a) *Knowledge and understanding*

The graduate should acquire the following during the period of training.

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data.
2. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general-state of health and also the bearing on physical and social well-being of the patient.
3. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive, diagnostic and therapeutic aspects of dentistry.
4. Adequate clinical experience required for general dental practice.
5. Adequate knowledge of biological function and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health so far as it affects dentistry.

(b) *Skills*

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

1. Able to diagnose and manage various common dental problems encountered in general dental practice, keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible.

2. Acquire skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.
3. Possess skill to carry out required investigative procedures and ability to interpret laboratory findings.
4. Promote oral health and help to prevent oral diseases wherever possible.
5. Competent in control of pain and anxiety during dental treatment.

(c) *Attitudes*

A graduate should develop during the training period the following attitudes.

1. Willing to apply current knowledge of dentistry in the best interest of the patients and the community.
2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
4. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time.
5. To help and to participate in the implementation of national health programmes.

Section III

Regulations relating to B.D.S. Course

I. ELIGIBILITY:

1.1 *Qualifying Examination:*

A candidate seeking admission to first BDS course:

- (a) Shall have passed the two years Pre-University Examination of Pre-University Board of Karnataka with English and Physics Chemistry and Biology as optional subjects. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually* also
OR

- (b) Shall have passed any other examination conducted by Boards/Councils/Intermediate Education established by State Governments/Central Government and recognised as equivalent to two year Pre University examination by the Rajiv Gandhi University of Health Sciences/Association of Indian Universities (AIU), with English as one of the subjects and Physics, Chemistry and Biology as optional subjects and the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

- (c) Shall have passed Intermediate examination in Science of an Indian University/Board/Council or other recognised examining bodies with Physics, Chemistry and Biology, which shall include a practical test in these subjects and also English as compulsory subject. The candidate shall have passed subjects of English, Physics, Chemistry and Biology individually.

OR

- (d) Shall have passed pre- professional/ pre- medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school examination. The pre-professional/ pre- medical examination, shall include a practical test in Physics, Chemistry and Biology and also English as compulsory subject.

OR

- (e) Shall have passed first year of the three year degree course of a recognised University with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is an 'University Examination' provided that the candidate shall have passed subjects of English, Physics, Chemistry and Biology individually in the pre university or other examinations mentioned in the clauses above.

OR

- (f) Shall have passed B.Sc. Examination of an Indian University, provided that he/she has passed the B.Sc. examination with not less than two of the following subjects: Physics, Chemistry, Biology (Botany, Zoology) provided the candidate has passed subjects of English, Physics, Chemistry and Biology individually in the qualifying examinations mentioned in clauses (a), (b) and (c).

1.2 Marks:

The selection of students to dental colleges shall be based on merit provided that:

- a) In case of admission on the basis of qualifying examination, a candidate for admission to BDS course must have passed individually in the subjects of Physics, Chemistry, Biology and English and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology in the qualifying examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above and must have passing marks in English.
- b) In case of admission on the basis of competitive entrance examination, a candidate must have passed individually in the subjects of Physics, Chemistry, Biology and English and must have obtained a minimum of 50% marks in Physics, Chemistry and Biology taken together at the qualifying examination and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks in Physics, Chemistry and Biology taken together in the competitive examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes notified by the Government, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above. (Vide Amendment to DCI Regulations, 2007, notified in Gazette of Government of India dated 10.09.2007).

II. Age Requirement:

The candidate shall have completed the age of 17 years at the time of admission or will complete this age on 31st December of the year in which he/she seeks admission.

III. Duration of the Course:

Five academic years with 240 teaching days in each academic year.

IV. Attendance requirement, Progress and Conduct:

Attendance requirement shall be as follows:

- a) 75% in Theory and 75% in Practical/Clinicals in each subject in each year.
- b) In case of subject in which the instructional programme extends through more than one academic year and hence there is no University Examination in the subject (i.e. non-exam going subjects), the attendance requirement shall not be less than 70% in Theory and Practical/ Clinical. However, at the time of appearing for the professional examination in the subject the candidate should satisfy the condition (a) above.

V. Titles of subjects of study:

First Year

- i) General Human Anatomy including Embryology and Histology.
- ii) General Human Physiology and Biochemistry, Nutrition and Dietics.
- iii) Dental Anatomy, Embryology and Oral Histology.
- iv) Dental Materials.
- v) Preclinical Prosthodontics and Crown & Bridge.

Second Year

- i) General Pathology and Microbiology.
- ii) General and Dental Pharmacology and Therapeutics.
- iii) Dental Materials.
- iv) Preclinical Conservative Dentistry.
- v) Preclinical Prosthodontics and Crown & Bridge.
- vi) Oral Pathology & Oral Microbiology.

Third Year

- i) General Medicine.
- ii) General Surgery.
- iii) Oral Pathology and Oral Microbiology.
- iv) Conservative Dentistry & Endodontics.
- v) Oral & Maxillofacial Surgery.
- vi) Oral Medicine and Radiology
- vii) Orthodontics & Dentofacial Orthopaedics.
- viii) Paediatric & Preventive Dentistry.
- ix) Periodontology.
- x) Prosthodontics and Crown & Bridge.

Fourth Year

- i) Orthodontics & Dentofacial Orthopaedics.
- ii) Oral Medicine and Radiology.
- iii) Paediatric & Preventive Dentistry.
- iv) Periodontology.
- v) Oral & Maxillofacial Surgery.
- vi) Prosthodontics and Crown and Bridge.
- vii) Conservative Dentistry & Endodontics.
- viii) Public Health Dentistry.

Fifth Year

- i) Oral & Maxillofacial Surgery.
- ii) Prosthodontics and Crown & Bridge.
- iii) Conservative Dentistry and Endodontics.
- iv) Public Health Dentistry.

VI. Teaching Hours

Teaching hours for each subject from first to final year – Theory and Practical are shown in the Tables –I to VI

TABLE - I Subjects and Hours of Instruction (B.D.S Course)

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
1.	General Human Anatomy including Embryology, Osteology and Histology	100	175	--	275
2.	General Human Physiology, Biochemistry, Nutrition and Dietics	120 70	60 60	--	180 130
3.	Dental Materials	80	240	--	320
4.	Dental Anatomy, Embryology, and Oral Histology	105	250	--	355
5.	Dental Pharmacology and Therapeutics	70	20	--	90
6.	General Pathology & Microbiology	55 65	55 50	--	110 115
7.	General Medicine	60	--	90	150
8.	General Surgery	60	--	90	150
9.	Oral Pathology and Microbiology	145	130	--	275
10.	Oral Medicine and Radiology	65	--	200	265
11.	Paediatric & Preventive Dentistry	65	--	200	265
12.	Orthodontics & Dental Orthopaedics	50	--	200	250
13.	Periodontology	80	--	200	280
14.	Oral & Maxillofacial Surgery	70	--	360	430
15.	Conservative Dentistry and Endodontics	135	200	460	795
16.	Prosthodontics & Crown & Bridge	135	300	460	895
17.	Public Health Dentistry	60	--	290	350
Total		1590	1540	2550	5680

Note: There should be a minimum of 240 teaching days every academic year consisting of 8 working hours including one hour of lunch break.

**TABLE - II Subjects and Hours of Instruction for
First year B.D.S**

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
01	General Human Anatomy including Embryology, Osteology and Histology	100	175	--	275
02	General Human Physiology,	120	60	--	180
03	Biochemistry, Nutrition and Dietics	70	60	--	130
04	Dental Anatomy, Embryology, and Oral Histology	105	250	--	355
05	Dental Materials	20	40	--	60
06	Principles of Prosthodontics and Crown & Bridge	--	100	--	100
Total		415	685	--	1100

**TABLE - III Subjects and Hours of Instruction for
Second year B.D.S**

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
01	General and Dental Pharmacology and Therapeutics	70	20	--	90
02	General Pathology,	55	55	--	110
03	Microbiology	65	50	--	115
04	Dental Materials	60	200	--	260
05	Oral Pathology and Oral Microbiology	25	50	--	75
06	Principles of Prosthodontics and Crown & Bridge	25	200	--	225
07	Principles of Conservative Dentistry	25	200	--	225
Total		325	775	--	1100

TABLE - IV Subjects and Hours of Instruction for Third year B.D.S

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
01	General Medicine.	60	--	90	150
02	General Surgery.	60	--	90	150
03	Oral Pathology and Oral Microbiology.	120	80	--	200
04	Conservative Dentistry & Endodontics.	30	--	70	100
05	Oral & Maxillofacial Surgery.	20	--	70	90
06	Oral Medicine and Radiology	20	--	70	90
07	Orthodontics & Dentofacial Orthopaedics.	20	--	70	90
08	Paediatric & Preventive Dentistry.	20	--	70	90
09	Periodontology.	30	--	70	100
10	Prosthodontics and Crown & Bridge.	30	--	70	100
Total		410	80	670	1160

TABLE - V Subjects and Hours of Instruction for Fourth year B.D.S

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
01	Orthodontics & Dentofacial Orthopaedics.	30	--	130	160
02	Oral Medicine and Radiology.	45	--	130	175
03	Paediatric & Preventive Dentistry.	45	--	130	175
04	Periodontology.	50	--	130	180
05	Oral & Maxillofacial Surgery.	20	--	90	110
06	Prosthodontics and Crown and Bridge.	30	--	90	120
07	Conservative Dentistry & Endodontics.	30	--	90	120
08	Public Health Dentistry.	30	--	90	120
Total		280	--	880	1160

**TABLE - VI Subjects and Hours of Instruction for
Fifth year B.D.S**

Sl. No.	Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
01	Oral & Maxillofacial Surgery.	30	--	200	230
02	Prosthodontics and Crown & Bridge.	50	--	300	350
03	Conservative Dentistry and Endodontics.	50	--	300	350
04	Public Health Dentistry.	30	--	200	230
Total		160	--	1000	1160

VII Schedule of Examination

The University shall conduct two examinations annually at an interval of not less than four to six months as notified by the University from time to time.

A candidate who satisfies the requirement of attendance, progress, and conduct as stipulated by the university shall be eligible to appear in the University examination. Certificate to the above effect should be produced from the Head of the Institution along with the application for examination and the prescribed fee.

VIII Scheme of Examination

The scheme of examination of B.D.S. course shall be divided into 5 professional examinations, viz., I.B.D.S. Examination at the end of first academic year, II B.D.S. at the end of second academic year, III B.D.S. at the end of third academic year and IV B.D.S. examination at the end of fourth academic year and V B.D.S. examination at the end of fifth academic year.

VIII. i. Internal Assessment

The internal assessment need not be limited to written tests. It should relate to other items such as maintenance of records, **participation** in seminars and group discussions, clinical case study, proficiency in carrying out practical or clinical skill or participation in projects and assignments (even) during vacation. These be evaluated objectively and recorded. **The weightage given to internal assessment is 10% out of total marks assigned for a subject separately for theory and practical/clinical examinations.**

A minimum of three internal assessments to be held in an academic year and the average of these tests shall be sent to the university.

VIII. ii. University Examination:

There shall be two examinations annually conducted at an interval of not less than four to six months. The written examination in each subject shall consist of one paper of three hours duration and shall have maximum of 70 marks.

IX. Distribution of subjects for University examination:

I B.D.S. Examination

1. General Anatomy including Embryology and Histology.
2. General Human Physiology and Biochemistry, **Nutrition and Dietics.**
3. Dental Anatomy, Embryology and Oral Histology.

II B.D.S. Examination:

1. General Pathology and Microbiology
2. General and Dental Pharmacology and Therapeutics.
3. Dental Materials.
4. Pre-clinical Conservative Dentistry – Only practical and Viva - voce.
5. Pre-clinical Prosthodontics - Only practical and Viva - voce.

III B.D.S. Examination

1. General Medicine.
2. General Surgery.
3. Oral Pathology and Oral Microbiology.

IV B.D.S. Examination

1. Oral Medicine and Radiology
2. Paediatric and Preventive Dentistry
3. Orthodontics and Dentofacial Orthopaedics
4. Periodontology

V. B.D.S. Examination

1. Oral & Maxillofacial Surgery.
2. Prosthodontics and Crown & Bridge.
3. Conservative Dentistry and Endodontics.
4. Public Health Dentistry.

X. Type of questions and distribution of marks:

Each question paper shall be of 3 hours duration, carrying maximum marks of 70. There shall be three types of questions with distribution of marks as shown in Table VII:

Table – VII

Type of Questions	No. of Questions	Marks per question	Total marks
Long Essay Type	2	10	20
Short Essay Type	8	5	40
Short Answer Type	5	2	10
		Grand Total	70

Note: In case of Physiology & Biochemistry and Pathology & Microbiology
The distribution of marks and types of questions will be as follows:

1. In the subject of General Human Physiology and Biochemistry, **Section 'A'** (Gen. Physiology) shall contain **one** Long essay type question carrying **10** marks and second question containing **three** short Essay type questions carrying **five** marks each, third question containing **five** Short Answer questions carrying **two** marks each. **Section 'B'** (Biochemistry) shall contain **one** Long essay type question of **10** marks and second question containing **three** short Essay type questions of **five** marks each, third question containing **five** Short Answer type questions carrying **two** marks each. As shown in Table-VIII.
2. In the subject of Gen. Pathology, **Section 'A'** (Gen. Pathology) shall contain **one** Long essay type question carrying **10** marks and second question shall contain **three** Short Essay type question carrying **five** marks each, third question containing **five** Short Answer questions of **two** marks each. **Section 'B'** (Microbiology) shall contain **one** Long essay type question carrying **10** marks and second question shall contain **three** Short essay type questions carrying **five** marks each, third question containing **five** short answer questions of **two** marks each. As shown in Table-IX.

Table – VIII

	Type of Questions	No. of question	Marks per question	Total Marks
PHYSIOLOGY	Long Type Essay	01	10	10
	Short Type Essay	03	05	15
	Short Type Answer	05	02	10
Gross Total				35
Biochemistry Nutrition and Dietics	Long Type Essay	01	10	10
	Short Type Essay	03	05	15
	Short Type Answer	05	02	10
Gross Total				35

TABLE – IX

	Type of Questions	No. of question	Marks per question	Total Marks
PATHOLOGY	Long Type Essay	01	10	10
	Short Type Essay	03	05	15
	Short Type Answer	05	02	10
Gross Total				35
MICROBIOLOGY	Long Type Essay	01	10	10
	Short Type Essay	03	05	15
	Short Type Answer	05	02	10
Gross Total				35

XI. Distribution of Marks in University Examination and Internal Assessment for various subjects from First year to Fifth year is shown in Table X:

TABLE –X Distribution of Marks in University Examination and Internal Assessment for various subjects from First year to Fifth year:

Subjects	THEORY				PRACTICALS/CLINICALS			GRAND TOTAL
	University paper	Viva voce	Internal Assessment	TOTAL	University examination	Internal Assessment	TOTAL	
I BDS								
1. General Anatomy including Embryology and Histology	70	20	10	100	90	10	100	200
2. Section- A General Human Physiology And Section- B Biochemistry Nutrition and Dietics	35	10	05	50	45	05	50	200
3. Dental Anatomy, Embryology and Oral Histology.	70	20	10	100	90	10	100	200
II BDS								
Section - A 1 General Pathology Section - B & Microbiology	35	10	05	50	45	05	50	200
2 General and Dental Pharmacology and Therapeutics	70	20	10	100	90	10	100	200
3 Dental Materials	70	20	10	100	90	10	100	200
4*Pre-clinical Conservative Dentistry	--	20		20	60	20	80	100
5*Pre-clinical Prosthodontics * No theory paper, Practical/Viva voce only.	--	20		20	60	20	80	100

III BDS								
1. General Medicine	70	20	10	100	90	10	100	200
2. General Surgery								
	70	20	10	100	90	10	100	200
3. Oral Pathology and Oral Microbiology								
	70	20	10	100	90	10	100	200
IV BDS								
1. Oral Medicine and Radiology	70	20	10	100	90	10	100	200
2. Paediatric & preventive dentistry								
	70	20	10	100	90	10	100	200
3. Orthodontics & Dento-facial orthopaedics								
	70	20	10	100	90	10	100	200
4. Periodontology								
	70	20	10	100	90	10	100	200
V BDS								
1 Prosthodontics and Crown and Bridge	70	20	10	100	90	10	100	200
2. Conservative Dentistry and Endodontics								
	70	20	10	100	90	10	100	200
3. Oral and maxillofacial Surgery.								
	70	20	10	100	90	10	100	200
4. Public Health Dentistry								
	70	20	10	100	90	10	100	200

XII. Eligibility to appear in University examination:

A candidate who has failed in any one subject only in either I year B.D.S or II year B.D.S or III year BDS or IV year BDS university examination shall be permitted to study next higher B.D.S. class provided that in order to avail the carry over facility such a candidate fulfills the following requirements:

- a. student shall have not less than 75% of attendance in Theory and Practical separately in all the examination subjects prescribed for that year.
- b. should have appeared in all the examination subjects prescribed for that year in the University examination simultaneously.

A Candidate has to pass the carry over subject before being eligible to appear for higher B.D.S Examination.

XIII. Criteria for Pass in the University Examination:

1. For declaration of pass in a subject, a candidate shall secure 50% marks in the University examination both in Theory and Practical/Clinical examinations separately, as stipulated below :
 - a. For pass in Theory, a candidate shall secure 50% marks in aggregate in University theory examination i.e. marks obtained in University written examination, viva voce examination and internal assessment (theory) combined together i.e. fifty out of One hundred marks.
 - b. In the University Practical/clinical examination, a candidate shall secure 50% marks in aggregate i.e. Practical /Clinical and Internal Assessment combined together i.e. 50/100 marks.
 - c. In case of pre-clinical Prosthetic Dentistry and Pre-clinical Conservative Dentistry in II BDS, where there is no written examination, minimum for pass is 50% of marks in Practical and Viva voce combined together in University Examination including Internal Assessment i.e. 50/100 marks.
 - d. Successful candidates who obtain 65% of the total marks or more shall be declared to have passed the examination in First Class. Other successful candidates will be placed in Second Class. A candidate who obtains 75% and above is eligible for Distinction. Only those candidates who pass the whole examination in the first attempt will be eligible for distinction or class.

XIV. Field Programme in Community Dentistry:

As a part of community dentistry program, students in the Clinical years will have to attend the various dental camps/ field programmes as part fulfillment of requirements of BDS examination to the satisfaction of the head of the Institution.

XV. Miscellaneous:

Migration/ Transfer of Students

- (1) Migration from one dental college to other is not a right of a student. However, migration of students from one dental college to another dental college in India may be considered by the Dental Council of India only in exceptional cases on extreme compassionate grounds*, provided the following criteria are fulfilled. Routine migrations on other grounds shall not be allowed.
- (2) Both the colleges, i.e. one at which the student is studying at present and one to which migration is sought, are recognised by the Dental Council of India.
- (3) The applicant candidate should have passed first professional BDS examination.
- (4) The applicant candidate submits his application for migration, complete in all respects, to all authorities concerned within a period of one month of

passing (declaration of results) the first professional Bachelor of Dental Surgery(BDS) examination.

- (5) The applicant candidate must submit an affidavit stating he/she will pursue 240 days of prescribed study before appearing at II nd Professional Bachelor of Dental Surgery(BDS) examination at the transferee dental college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

Note 1:

- (i) Migration is permitted only in the beginning of second year BDS course in recognized institutions.
- (ii) All applications for migration shall be referred to Dental Council of India by college authorities. No institution/University shall allow migrations directly without the prior approval of the council.
- (iii) Council reserves the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decisions where applicant has been allowed to migrate without referring the same to the Council.

Note 2:

* Compassionate grounds criteria:

- (i) Death of a supporting guardian.
- (ii) Disturbed conditions as declared by Government in the Dental College area.

B. Re-admission of candidates who discontinued the course:

A candidate who discontinues the course is eligible for re-admission subject to the following conditions:

1. Provision for re-admission is only once during the entire course.
2. He/she should seek readmission within three years from the date of discontinuation of the course.
3. He/she should pay the prescribed fees for the year for which he/she seeks admission and cannot claim readmission on the strength of fees paid earlier.
4. If the candidate discontinues after University Examination, he/she should reappear for the subjects in which he/she failed before seeking admission to the next higher class by paying examination fee etc.
5. He/she should put in two terms of attendance in the class for which he/she seeks readmission before appearing for the University Examination.

SECTION – IV
Course Contents
I BDS

**General Human Anatomy including
Embryology, Osteology and Histology**

Theory -100 Hrs.

I. Introduction: 10 hrs.

Scope, subdivisions, definitions and interpretation of anatomical terms, planes, anatomical positions, elements of anatomy including fascia muscles, blood vessels, nerves, joints and lymph vessels.

II. Osteology of Head & Neck: 20 hrs.

Skull - exterior - Norma and vault : Interior - Cranial fosse. Individual bones - mandible, maxilla, frontal, parietal, occipital, temporal, zygomatic, ethmoid, sphenoid, vomer, palatine, nasal bones.

Cervical vertebrae in general; C 1, C 2 & C 7 in particular Hyoid bone.

III. Gross Anatomy of Head and Neck: 30 hrs.

- a. Scalp - layers, blood supply, nerve supply, lymphatic drainage.
- b. Face - Muscles, blood supply, nerve supply, lymphatic drainage, lacrimal apparatus.
- c. Neck -
 - i. Cervical fascia
 - ii. Posterior triangle
 - iii. Anterior triangle - submental, digastric, carotid & muscular
 - iv. Midline structures of neck
- d. Cranial cavity - meninges; dural folds and sinuses; Hypophysis cerebrae.
- e. Orbit - nerves, vessels, extrinsic muscles of eyeball.
- f. Parotid region - parotid gland.
- g. Temporal and infra-temporal fossae - muscles of mastication, Maxillary artery, maxillary nerve and mandibular nerve.
- h. Temporo-mandibular joint.
- i. Submandibular region - submandibular salivary gland.
- j. Thyroid and parathyroid glands.
- k. Vessels of head & neck - Carotid, subclavian arteries, Internal jugular vein.
- l. Mouth, tongue and palate.
- m. Pharynx.
- n. Larynx.
- o. Cervical part of trachea and oesophagus.
- p. Nasal cavity and para nasal air sinuses.
- q. Lymphatic drainage of head & neck.
- r. Joints of neck - atlanto - occipital, atlanto-axial.

IV. Neuroanatomy: 12 hrs.

- a. Detailed description of cranial nerves - V, VII, IX, X (in the region of head and neck) XI, XII including their nuclei of origin, intra and extra cranial courses.
- b. Cervical spinal nerves and cervical plexus.
- c. Autonomic nervous system of head and neck.

V. Embryology: 12 hrs.

- a. Gametogenesis - spermatogenesis and oogenesis, fertilisation implantation, germ layer formation, fetal membranes and placenta.
- b. Development of branchial apparatus, pharyngeal arches, pouches and clefts.
- c. Development of face, jaws, oral cavity, tongue, palate, nasal cavity, paranasal air sinuses, salivary glands, thyroid gland, hypophysis cerebrae, temporo-mandibular joint.

VI. Histology: 16 hrs.

- a. Introduction of cytology and histology.
- b. Basic tissues - epithelial - simple; compound
- c. Connective tissue - cells, fibres - collagen, elastic, reticular
- d. Cartilage - hyaline, elastic, white fibro cartilages,
- e. Spongy and compact bones - TS, LS
- f. Muscular tissue - skeletal, cardiac and smooth,
- g. Nervous tissue - peripheral nerve and ganglia.
- h. Blood vessels - artery & vein.
- i. Glands - serous, mucous, mixed salivary glands.
- j. Lymph node tissue - lymph node, palatine tonsil, thymus & Spleen.
- k. Skin - hairy and non hairy
- l. Endocrine gland - pituitary, thyroid, parathyroid, suprarenal & pancreas.
- m. Lip, tongue & oesophagus
- n. Trachea and lung.

PRACTICALS

70 Classes of (2 1/2 hrs. each) (175 hrs)

- The following topics are included for examination - MUST KNOW.

Dissection Topics:

1. Scalp
2. Face including deeper dissection
3. Posterior triangle of neck.
4. Anterior triangles of neck -
 - a. median region
 - b. digastric
 - c. Carotid triangles.
5. Deep dissection of neck -
 - a. Thyroid gland
 - b. Great vessels of neck.
6. Parotid region.
07. Infra temporal fossa -

- a. Muscles of mastication
 - b. Mandibular nerve and its branches
 - c. Maxillary artery
 - d. Temporo mandibular joint
08. Sub mandibular region - gland, hyoglossus and its relations
 9. Mouth, palate and pharynx.
 10. Nasal cavity and paranasal air sinuses
 11. Tongue
 12. Larynx

Surface Anatomy: (to be included in practicals only)

MUST KNOW

Superior sagittal sinus; middle meningeal artery; pterion; facial artery; parotid gland and duct; facial nerve on face; common, external, internal carotid arteries; palatine tonsil; vocal cords; thyroid gland, spinal accessory nerve.

Radiological Anatomy: (Practicals only)

AP & Lateral views of head and neck. MUST KNOW Interpretation of normal radiological anatomy.

Histology Slides: - for Practical exam as Spotters & for Discussion.

1. Epithelium - simple squamous (mesentery)
2. Epithelium - simple Cuboidal (thyroid)
3. Epithelium - simple Columnar (Gallbladder)
4. Epithelium - simple Ciliated columnar
5. Epithelium - simple Pseudo-stratified ciliated columnar (Trachea)
6. Epithelium - simple Compound stratified squamous keratinised (skin)
7. Epithelium - simple - do - non-keratinised (oesophagus)
8. Compound - transitional (urinary bladder)
9. Areolar tissue.
10. Collagen fibres.
11. Elastic fibres.
12. Tendon.
13. Cartilage - hyaline
 - Elastic
 - White fibro.
14. Bone - T.S.
 - L.S.
15. Muscle - Skeletal (LS/TS)
 - cardiac
 - smooth.
16. Blood vessels - large sized artery
 - Medium sized artery
 - large vein
 - Medium vein
17. Peripheral nerve & ganglia
18. Serous salivary gland.
19. Mucous Salivary Gland.
20. Mixed Salivary Gland.

21. Lymph node.
22. Palatine tonsil.
23. Thymus
24. Spleen
25. Skin - hairy
26. Skin - non hairy
27. Lip
28. Tooth
29. Tongue
30. Trachea
31. Oesophagus
32. Lung
33. Thyroid & parathyroid
34. Pituitary
35. Suprarenal gland.
36. Pancreas.

Desirable to Know (to the Demonstrated)

1. Ear - external, middle & internal.
2. Spinal cord;
3. Brain Stem
4. Cerebellum
5. Cerebral hemispheres - important gyri & sulci of superolateral, medial and inferior surfaces;
functional areas - sensory, motor, auditory, visual, gustatory speech & splanchnic areas;
blood supply of brain;
6. Cranial nerves in general with functions other than V, VII, IX, XII.
7. Genetics - definitions, chromosomes, chromosomal aberrations;
8. Anthropology
9. Organs of thorax and abdomen.
10. Extremities - upper & lower limbs
11. Histology of
 - a. Stomach - fundus and pylorus;
 - b. Small intestine - duodenum, jejunum & ileum;
 - c. Large intestine - colon and appendix
 - d. Liver and gall bladder

Text Books Recommended :

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
1. Cunningham's manual of practical Anatomy (Vol-I)	G.J. Romanes	15 th	1998	ELBS Oxford	£ 3.95
2. Cunningham's manual of practical Anatomy (Vol-3)	G.J. Romanes	15 th	1998	ELBS Oxford	£ 3.95
3. Essentials of Human Anatomy (Vol.2)	A.K. Dutta	--	1999	Current Books International	Rs. 200/-
4. Human Embryology	Inderbir Singh	6 th	1996	Mc Milan India Ltd. Delhi	Rs. 242/-
5. Langman's Medical Embryology	Jan Langman	5 th	Nov 1994	William & Wilkins Pub. Baltimore, USA	Rs. 899/-
6. Text Book of Human Histology	Inderbir Singh	3 rd	1997	J.P. Brothers Medical Publishers Delhi	Rs. 200/-
Reference Books					
7. Gray's Anatomy	Peter L. Williams	38 th	1995	ELBS	£ 40.00
8. Last's Anatomy Regional and Applied	Mc Minn RMH	10 th	1999	Churchill Livingston, Edinburgh	£ 35.00
9. Grant's Method Anatomy	John V. Basmajian	11 th (Ind)	1997	D.I. Publishers	Rs. 725/-
10. Lee. Mc Gregor's Synopsis of Surgical Anatomy	G.A.G. Decker	12 th	--	K.M.Varghese Bombay	Rs. 350/-

General Human Physiology

Theory : 120 Hrs

MUST KNOW	Hours
I. General Physiology:	4
1. Cell- Morphology - Functions of organelles: Cell membrane, nucleus, mitochondria, ribosomes, Lysosomes.	
2. Muscle nerve physiology: Neurons: Morphology, classification Nerve fibres classification, resting membrane potential, action potential, properties, conduction of impulses in myelinated & nonmyelinated fibres.	8
3. Neuroglia : Types & functions. Muscles: Types, structure of skeletal & smooth muscles, Sarcomere, mechanism of contraction, strength-duration curves, utilization time, rheobase & chronaxie.	
4. Blood : Composition, properties, functions. RBC; Morphology, functions, count, physiological variations and life span Erythropoiesis - stages, essential factors, regulation.	15
5. Haemoglobin: Function, concentration, physiological variations Fate of Hb - Jaundice, types. Determination of color index, MCH, MCV, MCHC, PCV - normal values M = Mean, C = Corpuscular, H = Haemoglobin concentration.	
6. WBCs Morphology, functions of all types including T & B lymphocytes, total and differential counts, physiological variations, leukocytosis & Leukopenia.	
7. Platelets: Morphology, count, functions, thrombocytopenia & bleeding time. Plasma proteins : Concentrations and functions. Blood groups " Basis of blood grouping, Landsteiner's laws, ABO system, determination of blood groups, blood transfusion, complications of incompatible blood transfusion, RH group, erythroblastosis foetalis, prevention and treatment.	
8. Haemostasis : mechanisms. Clotting mechanism: factors, intrinsic and extrinsic pathways, Disorders of clotting - haemophilia, vitamin K deficiency. Anti-clotting mechanisms: Antithrombin III, heparin, thrombomodulin & plasminogen, anticoagulants.	
9. Anaemias: nutritional, aplastic, megaloblastic, iron deficiency. Effects of anaemia.	
10. Blood volume : Normal values, determination, regulation.	
11. Lymph : formation, circulation, composition, functions.	
II. Gastrointestinal System:	10
1. Salivary secretion : composition, functions, regulation (Deglutition - DESIRABLE TO KNOW).	
2. Stomach : functions. Gastric juice : composition, functions, regulation, gastrin, gastric emptying time.	
3. Pancreas : composition, function, regulation of pancreatic juice secretion. Secretion, cholecystokinin - pcreozymin.	
4. Liver : functions. Bile : composition, functions, Gall bladder: functions, regulation of emptying	
5. Succus entericus : composition, function, regulation of secretion.	
6. Movements of small and large intestines. Defaecation.	
III. Respiratory System :	12

1.	Physiological anatomy of the lungs.	
2.	Definitions of terms used in respiratory physiology : Eupnoea, Hyperpnoea, tachypnoea, apnoea, dyspnoea.	
3.	Mechanics of breathing - intrapulmonary and intrapleural pressure changes during a respiratory cycle.	
4.	Spirometry-lung volumes and capacities. Vital capacity, times vital capacity, maximal voluntary ventilation.	
5.	Dead space : types, measurement of anatomical dead space. Pulmonary & alveolar ventilation.	
6.	Surfactant : production, functions, respiratory distress syndrome. (Ventilation perfusion ratio: DESIRABLE TO KNOW)	
7.	Oxygen transport : Oxy Hb dissociation curves, factors affecting it.	
8.	Carbon dioxide transport : forms, chloride shift (Hamburgers phenomenon)	
9.	Regulation of respiration : Neural regulation : centers - Dorsal Group of Respiratory Neurons (DRG), Ventral group of respiratory neurons (VRG), Nuclear Para Brachialis medialis (NPBL), Hering-breuer reflex.	
10.	Chemical regulation : peripheral and central chemoreceptors, ventilatory responses to oxygen lack, carbon-di-oxide and H ⁺ ions, effect of voluntary hyper ventilation.	
11.	Hypoxia : Types and effects, acclimatization to high attitudes. Cyanosis, asphyxia, Artificial respiration.	
IV.	Cardiovascular System:	15
1.	Plan of CVS Greater and Lesser Circulation. Physiological anatomy of the heart, nerve supply. Structure and properties of cardiac muscle. Origin and spread of cardiac impulse. Cardiac cycle : Intraventricular pressure and volume curves Heart sounds, causes, characteristics and significance Normal ECG, leads causes of waves, P-R interval	
2.	Cardiac output : Definitions, normal values, physiological variations, determination, (Principles underlying the methods only), regulation.	
3.	Arterial blood pressure : Definitions, normal values, physiological variations, factors maintaining blood pressure, Regulation - Vasomotor control, role of afferents to Vasomotorceutee (VMC)-barp receptors, Bainbridge reflex, chemoreceptros, hypertension. Heart rate-physiological variations, sinus arrhythmia, Marey law, Bainbridge reflex, chemo receptors, radial pulse.	
5.	Hypovolaemic (Haemorrhagic) shock, physiological basis of signs and symptoms	
6.	Coronary circulation.	
V.	Renal System:	8
1.	Functions of kidneys. Nephrons - cortical & juxtamedullary. Juxta glomerular apparatus - functions.	
2.	Mechanism of urine formation : ultra filtration, GFR - Factors affecting, selective reabsorption- sodium, urea, water, glucose.	
3.	Tubular secretion	
4.	Water excretion, mechanism of urine concentration. Concept of clearance-insulin, PAH & urea clearances. Micturition, Innervation of bladder, cystometrogram, diuresis.	

VI. Endocrinology:	14
1. Major endocrine glands. Hormone: definition, properties, mechanisms of action. Anterior pituitary : Hormones and their functions, regulation of each hormone, disorders - Gigantism, acromegaly, dwarfism.	
2. Posterior pituitary : hormones - site of synthesis, regulation, diabetes insipidus.	
3. Thyroid : synthesis of hormones, actions and functions, regulation, disorders : simple goitre, myxoedema, cretinism, Graves disease.	
4. Adrenal cortex : classification of hormones, actions, functions, regulation of secretion of cortisol and aldosterone.	
5. Adrenal medulla : actions of adrenaline and noradrenaline, regulation of secretion.	
6. Endocrine pancreas : hormones, actions, functions, regulation of secretion. Regulation of blood glucose level, diabetes mellitus.	
7. Parathyroids : hormones, actions of hormones, regulation of secretion. Hypo- & hyper parathyroid conditions, tetany – signs. Calcitonin - source, actions.	
8. Regulation of blood calcium level – Calcitriol.	
VII. Reproductive Physiology:	06
1. Male reproductive system : functions of testes, puberty, spermatogenesis actions of testosterone, regulation of secretion, semen.	
2. Female reproductive system : Structure of ovary & Uterus, hormones, actions, regulation. Menstrual cycle, Hormonal basis of changes in menstrual cycle physiological changes during pregnancy. Action of oestrogen and progesterone, Functions of placenta, Lactation, milk ejection reflex.	
3. Family Planning Methods : In the males : Coitus interruptus, condoms, vasectomy.	
4. In females: Rhythm method, Intra Uterine Contraceptive Devise (IUCD), oral contraceptives, tubectomy.	
VIII. Nervous System:	10
1. Synapse : Types, properties Sensory receptors : definition, classification, properties. Reflex action : Definition reflex arc, classification, general properties. Pathways for fine touch, pressure, proprioception, crude touch, thermal and pain sensations, referred pain.	
2. Spino-cerebellar tracts : pathway and function. Pyramidal tracts: origin, course, termination and functions. Signs of upper & lower motor neurone lesions. Functions of Cerebellum, Basal ganglia, Thalamus, Hypothalamus. Signs of Cerebellar disorders & Parkinson's disease. (Reticular formation, EEG, Sleep (NREM, REM)) Functions of Limbic system, Higher function of Brain - Memory, Learning & Motivation. (DESIRABLE TO KNOW)	
3. Cerebral cortex : lobes & functions.	
4. Autonomic nervous system : Organization & functions.	
5. Cerebrospinal fluid : formation, circulation, composition and function, Lumbar puncture.	
6. Regulation of body temperature.	
IX. Special Senses:	18
1. Vision : physiological anatomy of eye ball, functions of iris, aqueous humor, lens, rods & cones. Accommodation to near vision.	

2.	Refractive errors : Myopia, hypermetropia, presbyopia & astigmatism. Visual acuity, pupillary reflexes.	
3.	Visual pathways.	
4.	Audition : Anatomic consideration, functions of outer, middle & inner ear, cochlea, organ of corti, mechanism of hearing.	
5.	Auditory pathways, deafness - types & tests	
6.	Taste : taste buds, primary taste sensation, pathway for taste sensation,	
7.	Smell : receptors, olfactory pathways.	

Practicals :

60 Hours

To be done by Students :	Hours
1. Study of Microscope and its uses	02
2. Collection of blood and study of haemocytometer	02
3. Haemoglobinometry	02
4. Determination of RBC count	08
5. Determination of WBC count	04
6. Determination of blood groups	02
7. Leishman's staining and differential leucocyte count	10
8. Calculation of blood indices	02
9. Determination of bleeding time	01
10. Determination of clotting time	01
11. Blood pressure recording	04
12. Auscultation of Heart sounds	04

Demonstrations (only)

1. Determination of Erythrocyte Sedimentation rate (ESR)	02
2. Determination of packed cell volume (PCV)	02
3. Determination of specific gravity of blood	02
4. Fragility test for RBC	02
5. Clinical examination of chest	02
6. Determination of vital capacity	02
7. Artificial respiration	02
8. Demonstration of deep and superficial reflexes	02
9. Activity of frog's heart and effects of Acetyl Choline, Atropine and Adrenaline.	02
Total	60

DESIRABLE TO KNOW

Transport mechanisms

Neuromuscular junction, excitation contraction coupling, Myasthenia gravis, Rigor Mortis

Body fluid compartments

Principles of measurement, normal values

Blood:

Development of WBC's & platelets

Electrophoresis, Plasma pheresis
Blood bank.

Respiratory system:
Compliance of the lungs
P 50 value, Co-efficient of oxygen utilization
Dysbarism, Dyspnoea - Dyspnoeic index
Non-respiratory function of respiratory system.

Cardio vascular system :
Cardiovascular changes in muscular exercise.

Renal system:
TmG, renal threshold for glucose, tubular load for glucose.
Counter current mechanism

Endocrinology:
Synthesis of thyroid hormone.
Disorders - Addison's disease, Cushings syndrome, Conn's Syndrome,
Adrenogenital syndrome, Pheochromocytoma
Methods of study of endocrine glands.
Central nervous system.

Reflexes - Flexion reflex, stretch reflex, reverse stretch reflex.

Connections of cerebellum, basal ganglia, Thalamus & hypothalamus

Functions of Vestibular apparatus - Reticular formation
EEG - sleep, Wakefulness.
Methods of study of functions of nervous system special senses,
Effects of lesions of visual pathways.
Field of vision, colour vision, colour blindness.

Structure of thyroid, pituitary, pancreas, parathyroid, Adrenal cortex and medulla.

Gastrointestinal function : Deglutition.
Respiratory System: Ventilation perfusion ration.
Nervous system: Reticular formation, EEG, Sleep (NREM, REM), functions of Limbic system,
Higher functions of brain - Memory, Learning & Motivation.

Scheme of Examination

A. Theory :

35 Marks

Distribution of Topics and Types of Questions

Contents	Type of Questions and Marks	Marks
Long Essay Questions preferably from 1. Blood 2. Gastro intestinal tract 3. Cardio Vascular System 4. Respiratory System 5. Endocrines 6. Reproductive System	Long Essays 01 x 10 marks	10
Short Essay Questions should be set from all the chapters. (Except the chapter on which a Long Essay Question has been set)	Short Essay 03 X 5 marks	15
Short Answer Questions should be set from all the chapters. (Except the chapter on which a Long Essay Question has been set)	Short Answers 05 x 2 marks	10
	Total	35 marks

B. Viva Voce

:

10 Marks

C. Internal Assessment - Theory : 05 marks, Practicals : 05 marks

D. Practicals

:

45 Marks

Major Experiments - 30 Marks

Any one of the Major Experiments

1. R.B.C. Count
2. W.B.C. Count
3. Differential Count
4. Blood Pressure Recording

Minor Experiments - 15 Marks

Any one of the minor Experiments

1. Determination of Blood Groups
2. Determination of Bleeding & Clotting time
3. Haemoglobin Estimation
4. Calculation of absolute Haematological Indices – MCH , MCV, MCHC

Text Books Recommended:

Name of the Book & Title	Author	Edn	Yr. Of Publ.	Publ.'s Name Place of Publ.	Price
1. Text book of Medical Physiology.	Guyton Arthur	09 th	1999	Prism & Sounder's Bangalore	Rs.515/-
2. Concise medical physiology	Chaudhuri Sujit. K	02 nd	1998	Central Book Agency Calcutta	Rs.495/-
3. Human Physiology Vol - I	Chatterjee C. C.	11 th	1998	Medical Allied Agency Calcutta	Rs.130/-
4. Human Physiology Vol - II	Chatterjee C. C.	10 th	1998	Medical Allied Agency Calcutta	Rs.120/-
Reference Books:					
5. Review of Medical Physiology	Ganong William. F	18 th	1989	Appleton & Lang USA	\$18.00
6. Physiological basis of Medical practice	Best & Taylor	10 th	1999	Willian & Wilkins Hongkong London	\$40.00

Biochemistry, Nutrition and Dietics

Theory : 70 hours

Sl.No	Must Know	Desirable to Know
1.		Introduction to biochemistry and its scope in dentistry. (1 hrs)
2.	<p>Carbohydrates: (4 Hrs.)</p> <ol style="list-style-type: none"> 1. Definition 2. Classification 3. Isomerism of Sugars 4. Physiologically important mono, di and polysaccharides 5. Glycogen, starch, cellulose 6. Mucopolysaccharides – hyaluronic acid, chondroitin sulphate, heparin 	
3.	<p>Amino Acids (6 Hrs.)</p> <ol style="list-style-type: none"> 1. Classification based on structure and nutritional importance 2. Optical activity 3. Isoelectric pH 4. Physiologically active peptides <p>Proteins-</p> <ol style="list-style-type: none"> 5. Definition 6. Functions 7. Classification 8. Structure 9. Denaturation 10. Plasma Proteins and their separation by electrophoresis 11. Immunoglobulins 12. Haemoglobin and its abnormal forms 	Special features and organisation of Proteins, collagen, structure and composition, muscle protein-actin and myosin
4.	<p>Lipids: (4 Hrs.)</p> <ol style="list-style-type: none"> 1. Definition 2. Classification 3. Functions 4. Fatty Acids 5. Neutral Fats 6. Phospholipids 7. Cholesterol 8. Lipoproteins 	

	Must Know	Desirable to Know
5.	Nucleic Acids : (3 hrs) 1. Composition 2. Structure & Types of Deoxy ribonucleic acid (DNA) & Ribonucleic acid (RNA) 3. Nucleosides and Nucleotides and their importance	Genetic Code
6.	Vitamins: (8 Hrs.) 1. Definition 2. Classification, Chemistry, Sources, Requirement, Function, Metabolic role and Deficiency signs of vitamins: A, D, E, K, C,. Thiamin, Riboflavin, Niacin, Pyridoxine, Folic Acid, Cyanocobalamine. .	
7.	Enzymes: (6 Hrs.) 1. Definition 2. Classification 3. Chemical nature 4. Enzyme specificity, mechanism of action 5. Properties of enzymes 6. Coenzymes and cofactors 7. Holoenzyme 8. Proenzyme 9. Isoenzyme 10. Factors influencing enzyme activity 11. Enzyme inhibition-types and examples	Diagnostic enzymes
8.	Carbohydrate Metabolism (8 Hrs.) 1. Digestion and absorption of carbohydrates 2. Glycolysis 3. Cori's cycle 4. Citric acid cycle 5. Energetics of glucose oxidation 6. Glycogenolysis 7. Glycogenesis 8. Hexose monophosphate shunt 9. Regulation of blood glucose	Fermentation, biochemical changes during muscular contraction, electron transport chain, oxidative phosphorylation, respiratory poisons, oxygen toxicity, gluconeogenesis, glycogen storage disorders.
9.	Lipid Metabolism (6 Hrs.) 1. Digestion and absorption of lipid 2. Beta oxidation of fatty acids and its energetics 3. Ketone body formation 4. Utilization 5. Ketoacidosis	Synthesis of palmitic acid and triglycerides, fatty liver, and lipotropic action, metabolism during starvation

	Must Know	Desirable Know
10.	Protein Metabolism (8 Hrs.) <ol style="list-style-type: none"> 1. Digestion and absorption of Amino acids 2. Synthesis of Proteins 3. Deamination of Amino acids 4. Transamination 5. Decarboxylation 6. Production and fate of ammonia 7. Urea cycle pathway 8. Methionine metabolism 9. Phenylalanine metabolism 10. Phenylketonuria, albinism, Alkaptonuria 	Glycine metabolism Synthesis of important products like creatine, noradrenaline, adrenaline, thyroxin, serotonin, heme from amino acids
11.	Nutrition and Dietics (5 Hrs.) <ol style="list-style-type: none"> 1. Dietary factors 2. Basal metabolic rate 3. Biological value of protein 4. Glucose sparing action 5. Essential amino acids 6. Dietary fibre 7. Essential fatty acids 8. Balanced diet 	Principles of calorimetry, Respiratory quotient, Specific Dynamic Action of foods, protein-calorie malnutrition (kwashiorkor and marasmus), nitrogen balance, milk-composition and functions, determination of Basal Metabolic Rate (BMR)
12.	Mineral metabolism (5 Hrs.) Distribution, sources, functions, requirements, absorption, metabolism, effect of deficiencies of <ol style="list-style-type: none"> 1. Calcium and phosphorus 2. Iron 3. Iodine 4. Fluorine 	
13.	Liver Function Tests: (3 hrs) <ol style="list-style-type: none"> 1. Liver function tests 2. Importance of alkaline phosphatase 3. Galactose tolerance test 	Van den Bergh reaction Albumin / Globulin Ratio Bromsulphathalein Excretion test Serum Glutamate Pyruvate Transaminase (SGPT) and other enzymes
14.	pH and its biological importance (2 Hrs.) <ol style="list-style-type: none"> 1. Acids and bases 2. Buffers 3. Acid base balance 4. Acidosis and alkalosis 	Henderson-Hasselbatch equation, role of the kidney in acid base balance.
15.	Renal Function Test (1 Hr.) <ol style="list-style-type: none"> 1. Urea clearance test 2. Creatinine Clearance 	

16.	Blood Constituents (1Hr.) Normal and abnormal variations of 1. Calcium and phosphorous 2. Creatinine 3. Alkaline and acid phosphatase	Normal and abnormal variations of Urea, cholesterol, bilirubin, uric acid, transaminases.
-----	--	--

Practicals: 60 hrs

1. Reactions of monosaccharides – glucose & fructose
2. Reactions of disaccharides – lactose, maltose and sucrose.
3. Preparation of osazones from glucose, fructose, lactose & maltose
4. Reactions of polysaccharides – starch
5. Identification of unknown carbohydrate
6. Colour reactions of proteins – albumin.
7. Colour reactions of proteins – gelatin & peptone.
8. Colour reactions of proteins – casein.
9. Precipitation reactions of albumin
10. Precipitation reactions of gelatin and peptone
11. Precipitation reactions of – casein
12. Identification of unknown protein
13. Reactions of urea, uric acid and creatinine
14. Identification of physiologically important constituents.
15. Composition of saliva and starch digestion by salivary amylase.
16. Qualitative analysis of gastric juice – normal and abnormal contents
17. Urine analysis – normal constituents.
18. Urine analysis – abnormal or pathological constituents.
19. Determination of titrable acidity and ammonia content in urine.
20. Determination of creatinine content in urine, calculation of creatinine clearance.
21. Estimation of Blood glucose.

Demonstration Sessions : (Desirable to know)

1. Colorimeter
2. Electrophoresis & Chromatography
3. Estimation of Serum calcium and phosphorus
4. Estimation of Bilirubin
5. Estimation of Urea in blood
6. Estimation of total protein in blood serum
7. Preparation of haemin crystals
8. Discussion of clinical charts – Glucose Tolerance Test (GTT)
9. Spotting of specimens –
 Haemin, Osazone – Microscopy, Ryle's tube, Folin –*wu* tube, Urinometer, Tests – Biuret reaction, Millon's reaction, Jaffe's reaction, Barfoed's reaction.

Scheme of Examination

A. Theory:

35 Marks

Distribution of Topics and Types of Questions

Contents	Type of Questions and Marks	Marks
Chemistry of Carbohydrates, proteins, lipids and amino acids. Fat soluble and water soluble vitamins. Enzymes. Metabolism of carbohydrates, proteins, lipids and minerals.	Long Essays 01 x 10 marks	10
Chemistry and metabolism of: carbohydrates, lipids, proteins, nucleic acids, minerals. Fats soluble and water soluble vitamins, Nutrition and dietetics, Liver function tests, pH and its biological importance, Renal function tests, Blood constituents, Biological oxidation.	Short Essay 03 X 5 marks	15
Chemistry and metabolism of: carbohydrates, lipids, proteins, nucleic acids, minerals. Fats soluble and water soluble vitamins, Nutrition and dietetics, Liver function tests, pH and its biological importance, Renal function tests, Blood constituents.	Short Answers 05 x 2 marks These questions may be selected from both 'must know' and 'desirable to know' category	10
	Total	35 marks

Preferably, 75% of questions can come from the 'must know' category which helps the candidate to pass, remaining may come from 'desirable to know' category, which places him/her in the merit category.

B. Viva – Voce:

10 Marks

C. Internal Assessment – Theory : 05 Marks, Practicals : 05 Marks

Internal Assessment (for theory):

75% - **Questions from MUST KNOW Category**

25% - **Questions from DESIRABLE TO KNOW Category**

D. Practicals:

45 Marks

1. One procedure for quantitative estimation = 20 marks
 2. One procedure for qualitative analysis = 15 marks
 3. Interpretation of Laboratory results in a given chart = 10 marks
- Total 45 marks

The following are suggested:

Quantitative Estimation (Any ONE estimation to be done)

1. Estimation of Blood Glucose – using Folin-*wu* method, using deproteinized blood.
2. Determination of Creatinine in Urine – using Jaffes’s method
3. Determination of Titrable acidity and Ammonia content of Urine – using Malfatti’s Method

Qualitative Analysis (Any ONE analysis to be done)

1. Identification of Carbohydrates – glucose, fructose, sucrose, lactose, maltose, starch.
2. Colour Reactions – albumin
3. Precipitation Reactions – albumin
4. Identification of Proteins – albumin, gelatin, casein, peptone
5. Urine Analysis – normal constituents
6. Urine Analysis – pathological constituents

Chart Interpretation (Interpretation of ONE Clinical chart)

1. Glucose Tolerance Test
2. Values of Blood Constituents and their clinical variation: - urea, cholesterol, calcium, phosphorus, bilirubin.

Recommended Books:

Name of the Book & Title	Author	Edn	Year of Publ.	Publishers Name and Place of Publication	Price
1. A Text book of Biochemistry for Dental Students	Harbans lal	1 st	1995	CBS Pub. New Delhi	Rs. 130/-
2. Concise Clinical Medical Biochemistry	Pattabhiraman	--	1986	Prithvi Pub.. Bangalore	Rs. 85/-
3. Fundamentals of Biochemistry	A. C. Deb	6 TH	1998	New Central Book Agency Calcutta	Rs. 395/-
4. Text Book of Biochemistry	AVS Rama Rao	7 th	1995	UBSPD with LKS pub. Vishakapatnam	Rs. 135/-
5. Textbook of Medical Biochemistry	S. Ramakrishnan K.G. Prasanna R. Rajan	3 rd	2001	Orient Longman Hyderabad	Rs. 410/-
Reference Books					
1. Review of Biochemistry	Harpers	24 th	1996	USA Appleton and Lange Pub.	US \$ 19.50
2. Basic and Applied Dental Biochemistry	William R.D & Elliot J.C.	2 nd	1990	Singapore Langman Pub.	US \$ 19.50
3. Principles of Biochemistry	Albert Lehninger	2 nd	1993	New Delhi CBS pub.	Rs. 695/-

Human Oral and Dental Anatomy, Embryology, Physiology and Histology

Theory - 105 Hrs.

I. DENTAL ANATOMY:	
1. Introduction, Dental Anthropology & Comparative Dental Anatomy	Sl.No. 1 To 4 - 3 HRS.
2. Function of teeth.	
3. Nomenclature.	
4. Tooth numbering systems (Different system) (Dental formula).	
5. Chronology of deciduous and permanent teeth. (First evidence of calcification, crown completion, eruption and root completion).	2 Hrs
6. Deciduous teeth - a) Nomenclature.	4 Hrs.
b) Importance of deciduous teeth.	
c) Form & function, comparative dental, Anatomy, fundamental curvature.	
7. Gross morphology of deciduous teeth.	5 Hrs.
8. General differences between deciduous and permanent teeth.	
9. Morphology of permanent teeth. - Chronology, measurements, description of individual surface and variations of each tooth.	3 Hrs.
10. Morphological differences between incisors, premolars and molars of same arch.	10 Hrs.
11. Morphological differences between maxillary and mandibular incisors, canines, premolars and molars of the opposite arch.	5 Hrs.
12. Internal Anatomy of Pulp.	1 Hr.
13. Occlusion: a. Development of occlusion. b. Dental arch form. c. Compensating curves of dental arches. d. Angulations of individual teeth in relation to various planes. e. Functional form of the teeth at their incisal and occlusal thirds. f. Facial relations of each tooth in one arch to its antagonist or antagonists in the opposing arch in centric occlusion. g. Occlusal contact and interscusp relations of all the teeth of one arch with those in the opposing arch in centric occlusion. h. Occlusal contact and interscusp relations of all the teeth during the various functional mandibular movements. i. Neurobehavioural aspect of occlusion.	8 Hrs.
Temporo Mandibular Joint (T.M.J.): - Gross Anatomy and articulation. - Muscles (Muscles of mastication). - Mandibular position and movements. - Histology. - Clinical considerations with special emphasis on Myofascial Pain Dysfunction Syndrome (MPDS) - (Desirable to Know)	
ORAL PHYSIOLOGY:	

1. Theories of calcification.	01 hr.
2. Mastication and deglutition.	01 hr.
Oral Embryology, Anatomy and Histology:	
1. Development and growth of face and jaws.	1 hr.
2. Development of tooth.	6 hrs.
3. Cranial nerves with more emphasis on V.VII and IX.	1 hr.
4. Blood supply, nerve supply and lymphatic drainage of teeth and surrounding structures.	1 hr.
5. Cell - structure and function.	1 hr.
6. Maxillary sinus - Structure, Variations, Histology function and clinical considerations.	3 hrs.
7. Salivary Glands - Classification, structure, function, Histology, Clinical Considerations and age changes.	4 hrs.
8. Oral Mucous membrane: - Definitions, General consideration. - Functions and classifications. - Structure and microscopic appearance of gingiva, palate, lips, alveolar mucosa, tongue, floor of mouth. - Gingival sulcus and dento gingival junction. - Clinical considerations and age changes.	8 hrs.
ENAMEL: - Physical characteristics, chemical properties structure. - Development - Life cycle of ameloblasts Amelogenesis and Mineralisation. - Clinical considerations. - Age changes.	8 hrs.
DENTIN: - Physical characteristics, chemical properties, structure. - Types of dentin. - Dentin innervation and hypersensitivity. - Development - Dentinogenesis and mineralisation. - Clinical considerations. - Age Changes.	6 hrs.
PULP: Anatomy, structural features, functions, pulp organs. - Developments. - Clinical consideration - Age changes.	5 hrs.
CEMENIUM: - Physical characteristics, chemical properties, structure. - Cementogenesis. - Clinical consideration - Age changes.	5 hrs.
PERIODONTAL LIGAMENT: -Cells and fibers - Functions - Development - Clinical Considerations. - Age Changes	5 hrs.

ALVEOLAR BONE: - Physical characteristics, chemical properties structure. - Structure - Development. - Internal reconstruction. - Clinical consideration.	5 hrs.
HISTOCHEMISTRY OF ORAL TISSUES. (Tissue processing)	4 Hrs.
THEORIES OF ERUPTION AND SHEDDING. (Physiological tooth movement)	4 Hrs

PRACTICAL : 250 Hours

Preparation of Ground sections, haematoxylin & Eosin sections & decalcified section - (Desirable to know).

<p>DENTAL ANATOMY: Carving on wax blocks:- a. Cube, rectangle, cone and cylinder b. Individual tooth - Only permanent teeth of both arches. - Central, Incisors, Lateral, Canines, Premolars and 1st molar.</p>	
<p>HISTOLOGY: List of Histology slides: Development of tooth: 01. Bud stage of tooth development. 02. Cap stage of tooth development. 03. Early bell stage of tooth development. 04. Late Bell stage of tooth development. 05. Root formation.</p> <p>ENAMEL: 01. Enamel rod. 02. Hunter-Schreger Bands 03. Tufts, Lamellae, Spindles. 04. Incremental lines of Retzius. 05. Neonatal line. 06. Gnarled Enamel.</p> <p>DENTIN: 01. Dentino - Enamel junction. 02. Dentinal Tubules. 03. Incremental lines of Von Ebner. 04. Contour lines of Owen. 05. Neonatal line. 06. Tomes granular layer. 07. Interglobular Dentin. 08. Secondary Dentin. 09. Intratubular Dentin. 10. Intertubular Dentin.</p> <p>CEMENTUM: 01. Cellular cementum.</p>	

<p>02. Acellular cementum.</p> <p>03. Cemento enamel junction</p> <ul style="list-style-type: none"> - Type 1 - 60% type - Overlapping. - Type 2 - 30% type - Butt - Type 3 - 10% type - Cementum & Enamel do not meet. <p>04. Sharpey's fibers.</p> <p>05. Hypercementosis.</p> <p>PULP:</p> <p>01. Zones of Pulp.</p> <p>02. Pulp stones.</p> <p>PERIODONTAL LIGAMENT:</p> <p>01. Principle fibers of Periodontal ligament</p> <ul style="list-style-type: none"> - Apical, Horizontal, Oblique, Alveolar crest, Interradicular, Transeptal <p>ALVEOLAR BONE:</p> <p>01. Haversian system.</p> <p>02. Trabeculated bone.</p> <p>03. Mature and immature bone.</p> <p>SALIVARY GLANDS:</p> <p>01. Mucous gland.</p> <p>02. Serous gland.</p> <p>03. Mixed gland.</p> <p>MAXILLARY SINUS:</p> <p>Sinus lining (Pseudostratified ciliated columnar)</p> <p>(Desirable to know)</p> <p>ORAL MUCOUS MEMBRANE:</p> <p>01. Parakeratinised epithelium.</p> <p>02. Orthokeratinised epithelium.</p> <p>03. Palate - Anterolateral zone.</p> <p>04. Palate - Posterolateral zone.</p> <p>05. Alveolar mucosa.</p> <p>06. Vermilion border of lip.</p> <p>07. Tongue - Circumvallate Papillae.</p> <ul style="list-style-type: none"> - Fungiform Papillae - Filiform Papillae <p>08. Dentogingival junction.</p> <p>09. Skin</p> <p>Temporo Mandibular Joint (T.M.J.):</p> <p>01. Histological section (Desirable to know).</p>	
--	--

LECTURE DEMONSTRATION :

01. Identification of Individual teeth.
 - Deciduous.
 - Permanent.
02. Mixed dentition using study models.
03. Cross - Section & T.S. of mandible and maxilla with teeth present using study models.

Demonstration of preparation of ground section, Decalcification, Paraffin section and H & E Staining.

Scheme of Examination

A. Theory : 70 Marks

Distribution of Topics and Type of Questions

Contents	Type of Questions and Marks	Marks
A. Dental anatomy - one question - 10 marks B. Dental histology - one question - 10 marks	Long Essays 2 x 10 marks	20
A. Oral histology - five questions - 25 marks B. Dental anatomy - two questions - 10 marks C. Oral physiology - one question - 05 marks	Short Essays 08 x 5 marks	40
A. Oral histology - two questions - 04 marks B. Dental anatomy - one question - 02 marks C. Oral physiology - one question - 02 marks D. Oral embryology - one question - 02 marks	Short Answers 05 x 2marks	10
	Total	70

B. Viva Voce : 20 Marks

C. Internal Assessment – Theory : 10 marks, Practicals : 10 marks

D. Practicals : 90 Marks

- | | | |
|-------------|---------------------------------|---------------|
| 1. Carving | 30 marks | 1 hour 15 min |
| 2. Spotters | 60 marks (20 spotter x 3 marks) | 1 hour 15 min |

- 13 histology and ground section slides
- 4 tooth identification
- 3 casts for identifications of teeth, numbering system and age assessment.

Text Books Recommended :

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
1. Orban's Oral Histology and Embryology	Orban's	10 th	1990	American Publication Ontoria, Canada	Rs. 350/-
2. Oral Histology – Development, Structure and Functions	A. R. Tencate	5 th	1998	Mosby A Harcourt Health Science Company USA	\$ 25.00
3. Dental Anatomy, Physiology and Occlusion	Wheeler's	7 th	1993	Prism Book Pvt. Ltd. Bangalore	Rs. 300/-

REFERENCE BOOK:

- Dental anatomy by Scoot & Simon.
- Oral Physiology by Lavelle.
- Oral Physiology by Jenkins.
- Dental Anatomy by Krauss.

I BDS
Dental Materials

	Theory - 20 Hrs. Practical – 40 Hrs.	Total 60 Hrs.
1.	Introduction: a. Brief History of the development of the science of Dental Materials b. Aim of studying the subject of Dental Materials. c. Scope and requirements of Dental materials d. Spectrum of materials - Clinical and laboratory applications (Classification of materials)	01
2.	Structure and behaviour of matter: a. Basic principles - Physical and mechanical properties, Chemical properties, biological properties, rheological properties, thermal properties, light, colour and esthetics. Tarnish and corrosion, surface properties and adhesion, biocompatibility allergy, toxicity, setting reactions. b. Enamel and Dentine and bone. c. Polymers d. Metals and alloys e. Ceramics f. Composites g. Standardisation and assessment of dental materials.	02
3.	Impression materials and duplicating materials: a. Requirements, classification. b. Desirable properties, composition, setting properties, advantages, disadvantages, indications and manipulation of inelastic and elastic materials. (Tray compound, impression compound, Low fusing compound, Impression plaster, Zinc oxide Eugenol impression paste, Non Eugenol paste, Alginate, Agar Elastomeric impression materials) Comparative studies between all.	03
4.	Gypsum products (Detail), die, cast and model materials (including brief account of electroformed dies):	02
5.	Waxes and baseplate materials - Contents, properties, manipulation and uses (Modeling wax, casting wax, boxing wax, utility wax, undercut blocking wax, sticky wax, impression wax (Correcta and Iowa) carding wax, preformed wax patterns.:	02
6.	Denture base resins a. Tray materials. b. Temporary base materials - contents, properties, manipulation, advantages and disadvantages. c. Permanent base resins - types, composition, properties and technical consideration (Flasking, packing, curing, deflasking and processing errors) d. Others – Tissue conditioners, soft liners and hard liners, elastic.	02
7.	Tooth restorative materials - Classification and ideal properties : a. Dental cements - classification ideal requirements of liners, base and luting cements. Composition, properties, chemistry of setting, manipulation and uses of	10

	silicate and silico phosphate cements (in brief), zinc phosphate, zinc polycarbxylate, calcium hydroxide, glass ionomer, modified glass ianomer and resin cement. Comparative studies of mechanical, biological and esthetic properties of all cements.	
8.	Metals and Alloys - Solidification and microstructure of metals, classification of alloys, relevant physical and mechanical properties, annealing, heat treatment, soldering, welding, fluxes and ant fluxes.	03

Practical Exercises : 40 Hours

II Exercises to be done by each student:

- a. Impression material - 20 hours
Manipulation and making impression and identifying setting time and defects.
(Comparative studies included)
- b. Gypsum products - 20 hours

Recommended Text Books

Title	Author	Edn.	Yr. of Publ.	Place of Publ.	Publ.'s Name	Price
1. Science of Dental Materials	Kennet. J. Anusavice	10 th	1996	USA	W.B. Sunder's Company	\$35.00
2. Notes on Dental Materials	E.C. Combe	06 th	1992	UK	Churchill Livingstone	4.95 pounds
3. Applied Dental Material	John. F. Mc. Cabe	07 th	1992	London	Oxford Blackwell Scientific pub.	Rs. 320/-
4. Text Book of Dental Material	Craip. O. Brien	06 th	1996	USA	Mosby	\$ 15.00

I BDS

Pre-Clinical Prosthodontics and Crown & Bridge

Practical: 100 Hours

1. Preparation of special trays
2. Preparation of temporary and permanent denture bases
3. Preparation of occlusion rims
4. Orientation of occlusion rims on articulator
5. Arrangement of teeth
6. Processing of complete dentures

RECOMMENDED TEXT BOOKS

Sl. No .	AUTHOR	TITLE	EDITION	YEAR OF PUBLN	PUBLISHERS NAME	PRICE
1.	Boucher	Prosthodontic Treatment of Edentulous Patients	XI	1997	Mosby St.Louis, Missouri, USA	\$ 76
2.	Heartwell	Syllabus of Complete Denture	IV	1992	Varghese Publishing House	Rs 595
3.	Tylman	Theory and Practice of Fixed Prosthodontics	VIII	1993	Ishiyaku Euro America Inc. 716, Hanley Industrial Court St. Louis Missouri, USA	\$ 69
4.	McCracken	Removable Partial Denture	VIII	1989	CBS Publishers & Distributors Shadara, Delhi	Rs 350
5.	Skinner	Science of Dental Materials	X	1996	W.B Saunders Company, Philadelphia, USA	\$ 35
6.	Craig	Dental Materials, Properties & Manipulation	VI	1996	Mosby St. Louis Missouri, USA	\$ 35

II - BDS

General Pathology

Theory: 55 Hours

	Hours
1. Introduction to pathology as scientific study of disease, evolution of modern pathology, subdivisions in pathology, techniques used in the study of pathology and terms used in pathology	01
2. Cellular structure and metabolism.	01
3. Disturbances of metabolism of cells-Intra cellular accumulations (Degenerations) Fatty change, accumulation of lipids, proteins and glycogen. cellular swelling, hydropic change, Hyaline change and mucoid degeneration. Disorders of pigmentation and pathologic calcification	02
4. Cell injury- Types, mechanism, intracellular changes, morphology with examples, Cell death. Necrosis - definitions, types of necrosis with examples and cellular changes (morphology), mechanism. Apoptosis - definition, examples, morphology Gangrene- definition, types with examples, differences between dry and wet gangrene, stressing mainly on cancrum oris.	04
5. Amyloidosis - definition, pathogenesis and emphasis on localised amyloidosis, special stains for amyloidosis.	02
6. Inflammation and Repair-Acute and chronic inflammation. Chemical mediators of acute inflammation, Outcome of acute inflammation. Granulomatous inflammation - definition of granuloma, Types of granuloma, with examples. Patterns and systemic effects of inflammation.	04
7. Healing of a wound in general with special emphasis on healing of a fracture. Factors affecting wound healing.	02
8. Immunity and hypersensitivity, definition, types mechanisms of immunology tissue injury with examples.	01
9. Infection and infestation - Bacterial- like pyogenic infections, typhoid fever, viral like AIDS, Hepatotropic viruses.	04
10. Circulatory disturbances - Hyperaemia, congestion, haemorrhage, shock, oedema, thrombosis, embolism and infarction. Hypertension.	05
11. Disturbances of Nutrition; Pathogenesis of deficiency diseases with special reference to disorders of vitamins like C, D, K and Vitamin B complex	03
12. Diabetes mellitus types, Aetio Pathogenesis, morphological changes in different organs, complications and lab investigations.	02

- | | |
|---|----|
| 13. Cellular growth and differentiation, Regulation. Adoptive disorders of growth- Atrophy, Hypertrophy Hyperplasia, metaplasia. Types and pathologic changes of dysplasia and premalignant lesions. | 03 |
| 14. Neoplasia : Definition, classification, characteristics of benign and Malignant tumours. Routes of spread of malignant tumours, Aetiology and Pathogenesis of neoplasia, clinical aspects and laboratory diagnosis of cancer. | 04 |
| 15. Common diseases of bone – osteomyelitis, tumours and tumours like lesions of bone. | 03 |

Haematology and Clinical Pathology

- | | |
|--|----|
| 1. Anaemias - Iron deficiency anemia, Vit.B12 or Folic acid deficiency anaemia and haemolytic anaemias and their lab investigations. | 03 |
| 2. Pathologic variations in white cell counts and leukemoid reactions. | 01 |
| 3. Neoplastic Proliferation of Leucocytes – Leukaemias and Lymphomas with investigations. | 04 |
| 4. Haemorrhagic disorders with their lab investigations. | 02 |
| 5. Blood grouping and cross matching-Blood transfusion and transfusion reactions. | 01 |
| 6. Urine analysis - physical, chemical and microscopy. | 01 |
| 7. Introduction to diseases of oral Cavity & Salivary glands-inflammatory conditions, infections, premalignant conditions and squamous cell carcinoma of oral cavity sialadenitis, pleomorphic adenoma and Warthin’s tumour. | 02 |

PRACTICALS AND LECTURE DEMONSTRATIONS : 55 hours

Anti coagulants, packed cell volume and calculation of blood indices with their clinical importance.

- Bleeding time, coagulation time and erythrocyte sedimentation rate with their significance.
- Instruments, Identification and their uses :
 - a. Neubauer’s counting chamber.
 - b. Haemoglobinometer
 - c. W.B.C.Pipette
 - d. Wintrobe tube
 - e. Urinometer.
- Cytologic techniques - FNAC and Buccal smear - Desirable to know.
- **Study of Anaemias - Iron deficiency anaemia, Megaloblastic anaemia and dimorphic anaemia.**
- Study of acute leukemias
- Study of chronic leukemias.

SLIDES :

- Acute appendicitis, granulation tissue.
- Actinomycosis, Rhinosporidiosis, Rhinoscleroma
- Tubercular Lymphadenitis, Fatty liver.
- Chronic Venous congestion (CVC) liver, spleen and lung.
- Squamous papilloma, transitional cell papilloma, pleomorphic adenoma
- Capillary and cavernous haemangioma, warthins tumour.
- Fibroma, Neurofibroma, lipoma
- Osteoma, chondroma
- Squamous cell carcinoma, basal cell carcinoma
- Adenocarcinoma, Malignant melanoma.
- Osteosarcoma, osteoclastoma.

SPECIMENS:

1. Acute Appendicitis.
2. Tuberculosis Lymph node.
3. Fatty liver.
4. Infarction spleen.
5. Chronic Venous Congestion (C.V.C.) Liver
6. Squamous papilloma
7. Basal cell carcinoma
8. Lipoma
9. Squamous cell carcinoma
10. Malignant Melanoma
11. Adenocarcinoma
12. Osteosarcoma
13. Osteoclastoma.
14. Gangrene.

PRACTICALS THAT MUST BE DONE BY THE STUDENTS :

- Determination of Haemoglobin percentage and Blood grouping.
- Total Leukocyte count
- Peripheral blood smear staining, differential leukocyte count.
- Urine examination - for sugar, ketone bodies, protein, blood, bile pigments and bile salts.

Scheme of Examination

A. Theory : 35 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Question from General Pathology Inflammation, Healing and Repair, Tuberculosis, Leprosy, Syphilis, Thrombosis, Diabetes Mellitus, Neoplasia.	Long Essays 1 x 10 marks	10
Two or three questions from General Pathology Intracellular accumulations, Necrosis, Gangrene, Apoptosis, Amyloidosis, Pathologic calcification, hypersensitivity reactions, Infections, Shock, Oedema, Infarction, Congestion, Hypertension, Diabetes Mellitus, Premalignant Conditions, Neoplasia, Osteomyelitis, Anaemias, Neoplastic Proliferation of WBCs – Leukaemias and Lymphomas, Haemorrhagic disorders, Erythrocyte Sedimentations Rate (ESR), Urine sediment.	Short Essays 3x 5 marks	15
Two from Haematology One from Clinical Pathology		
Two questions from Haematology Two questions from Clinical Pathology One from General Pathology	Short Answers 5 x 2 marks	10
	Total	35

B. Viva Voce : 10 Marks

C. Internal Assessment - Theory : 05 Marks, Practical : 05 Marks

D. Practicals : 45 Marks

1. Spotters

Haematology slide	-	2
Histopathology slides	-	6
Specimens	-	4
Instruments	-	3

15 Marks

2. To examine given sample of urine for abnormal constituents - 10 Marks

3. To do differential count on the given peripheral blood smear - 10 Marks

4. To estimate haemoglobin percentage in the given sample of blood - 10marks

or

To determine blood groups (ABO and Rh) in the given sample of blood

Text Books Recommended :

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
1. Robbin's pathologic basis of disease	Cotran & Kumar, Robins	6 th	1999	Prism & Saunders Bangalore	
2. De.Gruchy Clinical Haematology in Medical Practice	Frank Firskin Colin Chesterman David Penington Bryan Rush	5 th	1999	Oxford University Press New Delhi	
3. Pathology for dental students	Harsh Mohan	1 st	1994	--	
4. Medical Laboratory Technology (Methods and Interpretation)	Dr. Ramnik Sood	5 th	1994	Jaypee Brothers New Delhi	Rs. 250/-
Reference Books					
1. Clinical Diagnosis and Management by Laboratory Methods	Todd, Sanford, John Bernard Davidson	20 th	2001	Veerendar Kumar Arya for AITBS with Saunders New Delhi	Rs.1250/-
2. Haematology an illustrated colour text	Martin R. Howard Peter J Hamilton	1 st	1997	Churchill Livingstone USA	£ 4.95
3. General Pathology Vol. I & II	Y.M. Bhende and S.G. Deodhare	5 th edn. Under print		Popular Prakashan Bombay	
4. Colour Atlas of Histopathology	R. C. Curran	4 th (Revised)	2000	Harvey Miller Oxford university press	Rs. 1250/-

II - BDS

Microbiology

Theory: 65 Hrs.

	Teaching Hours
I. GENERAL BACTERIOLOGY	
1. Introduction, History and classification.	02
2. Morphology, Physiology of Bacterial cell.	02
3. Bacterial Genetics	02
4. Infection	02
II. IMMUNOLOGY	
1. Immunity	02
2. Antigen	01
3. Antibodies	01
4. Structures and functions of Immune system	01
5. Immune response	01
6. Antigen and antigen reactions & compliment	04
7. Hypersensitivity	02
8. Auto immunity	01
9. Immunology of transplantation	01
III. SYSTEMATIC BACTERIOLOGY	
1. Staphylococci	01
2. Streptococci (Dental Caries)	02
3. Pneumococci	01
4. Meningococci & Gonococci	01
5. Coryne bacterium diphtheriae	02
6. Bacillus	01
7. Clostridia	02
8. Non sporing Anaerobes	02
9. Mycobacteria	03
10. Coliforms proteus, Salmonella, Shigella, Vibrio, Pseudomonas	02
11. Spirochaetes (Treponema, Leptospira and Borrelia)	03
12. Normal Bacterial flora of the oral cavity	01
IV. VIROLOGY	
1. General properties of viruses	03
2. Herpes viruses	02
3. Measles and Mumps	01
4. Rabies virus.	01
5. Hepatitis viruses	02
6. Human Immuno deficiency Virus (HIV)	01
7. Adeno oncogenic viruses & Poliomyelitis	02

V. PARASITOLOGY

1. Introduction to parasitic diseases 01
2. Entamoeba histolytica, Malaria, Leishmania 03

VI. MYCOLOGY

1. Candidiasis (in detail) 02
2. Rhinosporidiosis 02

VII. APPLIED MICROBIOLOGY

1. Immunisation schedule, Collection of materials, Experimental animals & hospital infections. 02

MUST KNOW - MANDATORY TO KNOW

I GENERAL BACTERIOLOGY

1. Morphology - Structure, appendages, demonstration.
2. Physiology - Nutritional requirement, growth curve.
3. Bacterial genetics - Mechanism of genetic transfer, drug resistance.
4. Infection- definition, bacterial factors, Host factors, types of infection, carrier, septicaemia, bacteraemia, pyemia, toxemia, epidemic, endemic, pandemic, nosocomial infection.

II. IMMUNOLOGY

1. Immunity - Definition, classification, factors, mechanisms examples
2. Antigens - definition, types and properties.
3. Antibodies - structure, functions of diff. types of Immuno globulins.
4. Immune system - structure, function of T cells, B cells, differences.
5. Immune response - factors responsible for immune variations, adjuvants, mechanism.
6. Antigen - Antibody reactions - definition, mechanism, examples, clinical applications of Ag-Ab reactions like agglutination, precipitation, Complement Fixation Test (CFT), Neutralisation, Fluorescent Immune test, Opsonisation , ELISA test etc.
7. Hypersensitivity - definition, classification, mechanisms.
8. Autoimmunity - Theories, definition, classification, mechanisms.

III. SYSTEMATIC BACTERIOLOGY

1. Staphylococci - Classification, morphology, pathogenesis, pathogenicity tests, lesions, lab diagnosis and treatment.
2. Streptococci - Classification, morphology, cultural characters, Pathogenesis, lab diagnosis, sequelae, Dental plaque, Dental caries & its diagnosis.
3. Pneumococci - Morphology, cultural characters, diff. between pneumococci and streptococci, pathogenicity and lab diagnosis.

4. Meningococci - Causes of bacterial meningitis, Morphology, lab diagnosis of bacterial meningitis including meningococcal meningitis.
5. Corynebacterium - diphtheriae - Morphology, cultural characters toxigenicity, its occurrence, spread, lab diagnosis, prophylaxis.
6. Bacillus species - Morphology, lesions and lab diagnosis.
7. Clostridia - Classification, pathogenesis, lab diagnosis of gas gangrene tetanus, prophylaxis and clinical features.
8. Nansporing anaerobes - Classification, pathogenesis, lesions, Lab diagnosis in respect to dental infections.
9. Mycobacteria - Mycobacterium leprae, Mycobacterium tuberculosis, Atypical mycobacteria, Morphology, classification, cultural characters, pathogenesis, lab diagnosis, susceptibility test and prophylaxis.
10. Actinomycosis - Morphology, lesions in respect to orofacial lesions, lab diagnosis
11. Spirochaets - classification, morphology, pathogenesis & lab diagnosis of Treponema, Borrelia, Leptospira.
12. Normal Bacterial flora of the oral cavity - Enumerating the organisms opportunistic importance in dental practice.

IV. VIROLOGY

1. General virology - general properties, definition, classification, structure, pathogenesis, cultivation, lab diagnosis, antiviral agents immunology.
2. Herpes viruses - structure, classifications, lesions and lab diagnosis HSV 1, 2, EBV CMV, Virus Zoster (VZ) virus
3. Measles & Mumps viruses - structure, lesions, prophylaxis and lab diagnosis.
4. Hepatitis viruses - ABCDE; structure, route of entry, lesions, lab diagnosis and prophylaxis.
5. HIV - classification, structure, pathogenesis, route of entry opportunistic infection in AIDS, lab diagnosis - prophylaxis

V. MYCOLOGY

1. Candida - Morphology, lesions, lab diagnosis, diff. Species in relation to oral candidiasis
2. Rhinosporidiosis

VI. PARASITOLOGY

Introduction to parasitology - classification, general diseases caused by them.

Entamoeba, Malaria, Leishmania - Morphology, Clinical features, pathogenesis and lab diagnosis.

DESIRABLE TO KNOW (Theory questions need not be asked from this list)

I. GENERAL BACTERIOLOGY :

1. Introduction
2. Historical aspects
3. Calcification.

II. IMMUNOLOGY :

1. Complement - properties and functions.
2. Immuno deficiency diseases, enumerating the diseases
3. Immunology of transplantation, classification and brief description of transplantation.

III. BACTERIOLOGY :

1. Gonococci - Morphology, lesions, lab diagnosis.
2. Coliforms - Classification, pathogenesis, infections caused by them and lab diagnosis.
3. Proteus - Classification, pathogenesis, infections caused by them and lab diagnosis.
4. Salmonella - pathogenesis, lab diagnosis, prophylaxis.
5. Shigella - classification, pathogenesis, lab diagnosis
6. Vibrio - pathogenesis & lab diagnosis
7. Pseudomonas - Importance in hospital infection and drug resistance.

IV. VIROLOGY :

1. Adeno & oncogenic viruses.
2. Rabies viruses- structure, pathogenesis, clinical feature, lab diagnosis, prophylaxis.
3. Poliomyelitis - Pathogenesis, clinical feature, lab diagnosis, prophylaxis.

V. PARASITOLOGY:

1. Important Helminthic parasites.

VI. APPLIED MICROBIOLOGY :

1. Immunisation schedule – prophylaxis
2. Collection of materials - for lab diagnosis
3. Experimental animals - Uses of animals in dentistry

NICE TO KNOW :

- Opportunistic fungal infections
- Cryptococcosis
- Enteric fever in detail
- Malaria in detail
- Acute respiratory infections
- Organisms causing diarrhoeas

PRACTICALS & PRACTICAL DEMONSTRATIONS : 50 Hours MUST KNOW :

PRACTICAL DEMONSTRATIONS

- | | |
|---|------------|
| 1. Sterilisation and disinfection in detail | 06x02 = 12 |
| 2. Culture media | 03x02 = 06 |
| 3. Cultural methods & Anaerobic methods | 02x02 = 04 |
| 4. Identification of bacteria & demonstration | 02x02 = 04 |
| 5. Microscopy | 02x02 = 04 |

PRACTICALS

- | | |
|--|------------|
| 6. Simple stain and hanging drop
(Not form exams) | 01x02 = 02 |
|--|------------|

7. Grams stain	03x02 = 06
8. Alberts stain	03x02 = 06
9. Ziehl Neilsen's stain	03x02 = 06

Total Hrs.	50

Sterilization - definition, classification, methods, physical, filtration, radiation, chemicals - used in dental practice, hospital practice.

Culture media - Classification, uses.

Culture methods - Inoculation methods, antibiotic sensitivity, Anaerobic culture techniques.

Microscopy - maintenance, uses, different parts, different types.

LIST OF PRACTICAL MATERIALS

SLIDES FOR DEMONSTRATION :

1. Staphylococcus
2. Streptococcus
3. Gonococcus
4. Pneumococcus
5. M tuberculosis
6. M leprae
7. Anthrax
8. Cl. tetani
9. Spirochaetes
10. Gram Negative Bacilli
11. Candida
12. (Actinomyces)

SLIDES FOR PRACTICAL EXERCISES :

Grams stain - Staphylococci
 - Gram negative bacilli
 - Mixture of any two organisms
 - Gram stain of the oral cavity.

Alberts stain – Kleb’s Loffeler’s Bacilli (KLB) culture slide

Ziehl-Neelson’s stain - Sputum positive for AFB

MEDIA FOR DEMONSTRATION :

UNINOCULATED MEDIA :

1. Nutrient agar plate
2. Blood agar plate

3. Chocolate agar plate
4. Macconkey agar plate
5. Glucose citrate broth (Blood culture bottle)
6. Lowenstein Johnson's Media slope
7. Loefflers serum slope
8. Sabourauds slope
9. Milk agar plate
10. Robert Cooked Meat broth

INOCULATED MEDIA:

1. Nutrient agar with staphylococci
2. Blood Agar with Alpha Haemolytic Streptococci.
3. Blood Agar with Beta Haemolytic Streptococci.
4. Potassium Tellurite with growth of *C.diphtheriae*
5. Milk agar with staphylococci
6. Antibiotics sensitivity plate

ANIMALS:

1. Guinea pig
2. Rabbit
3. Mice

INSTRUMENTS:

1. VDRL slide
2. Tuberculin syringe
3. Sterile swab
4. Seitz filter
5. Macintosh filter jar
6. Widal rack with tubes
7. Microtitre plate
8. Disposable syringe
9. Surgical gloves

THEORY

	First Term		Second Term
General Bacteriology	- 08		Systematic Bacteriology - 21
Immunology	- 14		Virology - 12
Mycology	- 04		Applied Microbiology - 02
Parasitology	- 04		-----
			35
TOTAL:	----- 30 -----		-----

Scheme of Examination

A. Theory : 35 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
One Long Essay question from Systematic Bacteriology	Long Essays 1 x 10 marks	10
One question from General bacteriology One question from Immunology One question from Mycology One question from Parasitology / Oral Microbiology One question from Systematic Bacteriology	One Short Essays 3 x 5 marks	15
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions from Virology	One Short Answers 5 x 2 marks	10
	Total	35

B. Viva Voce : 10 Marks

C. Internal Assessment – Theory : 05 marks, Practicals : 05 marks

D. Practicals : 45 Marks

Spotters : 10 Slides - 05	
Media - 03	
Instruments - 02	20 Marks
 Gram's Stain	 12 Marks
 Ziehl - Neelsen's Stain	 13 Marks

Text Books Recommended :

Name of the Book & Title	Author	Edn. and Yr. of Publication	Publisher's Name and Place of Publication	Price
Text Book of Microbiology	R.Anantha Narayan and C. K.Jayaram Paniker	6 th 2000	Orient Longman Madras	Rs. 310/-
Medical Microbiology Volume I	Cruickshank	13 th 1989	Medical Division Orient Longman group Edinburg	£ 10.50
Text Book of Bacteriology	Fair Brothers	--	--	--

Reference Books

Bacteriology for Dental Students	T.H. Merville and G.L. Slack	--	Medical Book Ltd. London	--
Bacteriology for students of Dental Surgery	R.B. Lucas and Ivor R.H.Kramer	--	Calcutta	--
Oral Microbiology and Infectious Diseases	Burnett and Scherp	--	Oxford Book Company Calcutta	--
Immunology	Donald M Weir	7 th 1993	Longman Singapore Pub. Lt. Singapore	£ 2.50
Medical Parasitology	N.C.Dey and T.K.Dey	10 th 1997	New Central Book Agency Pvt.Ltd. Calcutta	Rs. 150/-
Notes on Medical Virology	Morag C. Timbury	--	--	£ 5.00
Manual of Clinical Mycology	Conant and Smith	--	--	--

II - BDS

General and Dental Pharmacology and Therapeutics

Theory : 70 Hrs.

I	
1. General Pharmacology :	1 hour
a. Definitions : Pharmacology, drug, Pharmacy, sources of drugs with examples.	
b. Pharmacokinetics with clinical implications.	2 hours
c. Routes of administration : oral, inhalation, intradermal, Subcutaneous, intramuscular, intravenous intrathecal, perineural & Newer drug regimes (Advantages and disadvantages with the examples of drugs administered).	1 hour
d. Pharmacodynamics : mechanism of action, factors modifying drug actions with emphasis on factors like - age, sex, dose, frequency & route of administration, presence of other drugs, Pharmacogenetics and Pathological conditions.	2 hours
e. Therapeutics : Principles of drug therapy, Adverse drug reactions and drug interactions.	3 hours
2. ANS drugs : Clinically used examples, their important pharmacological actions (which form the basis for the uses), clinical uses along with dental uses if any and specific adverse effects of -	
a. Sympathomimetics	1 hour
b. Sympatholytics - alpha blockers, Beta - blockers.	2 hours
c. Cholinomimetics.	2 hours
d. Anticholinergics.	2 hours
3. Detailed pharmacology of :	2 hours
A. a. Clinically used opiod and non-opiod analgesics.	2 hours
b. Clinically used local anesthetics.	
B. Enumeration of clinically used agents, their brief Pharmacology, clinical uses along with dental uses if any, and specific adverse effects of :	
a. Ethyl alcohol - actions, uses and drug interactions.	1 hour
b. General anesthetics	2 hours
c. Preanaesthetic medication.	
d. Antipsychotics, antidepressants, anxiolytics.	2 hours
e. Sedative hypnotics	2 hours
f. Antiepileptics	1 hour

4. CVS drugs : Enumeration/Classification of clinically used agents their important pharmacological actions (that form the basis of their uses) Clinical uses along with dental uses if any, and specific adverse effects of :	
a. Cardiac glycosides	1 hour
b. Antianginal drugs	1 hour
c. Antihypertensives.	1 hour
d. Diuretics	1 hour
e. Pharmacotherapy of shocks - anaphylactic, cardiogenic hypovolemic & Septic.	1 hour
5. Drugs acting on blood : Detailed pharmacology of :	
a. Coagulants, anticoagulants, fibrinolytics, anti platelet drugs and styptics	3 hours
b. Hematinics : Iron preparation Vit.B12, Folic acid Vit.C -	3 hours
c. Vit.D and calcium preparations.	1 hour
6. Endocrines : Enumeration/Classification of clinically used agents and their preparations, Mechanism of action, clinical uses along with dental uses if any and specific adverse effects of:	
a. Drugs used in diabetes mellitus	2 hours
b. Corticosteroids.	2 hours
7. Chemotherapy : Enumeration/Classification of clinically used Agents, their mechanism of action clinical uses along with dental uses if any and specific adverse effects of:	
a. Sulfonamides	1 hour
b. Beta-lactum antibiotics	2 hours
c. Macrolides and aminoglycosides	1 hour
d. Broad spectrum antibiotics	1 hour
e. Antifungal and antiviral (acyclovir) agents.	2 hours
f. Metronidazole and fluoroquinolones	1 hour
g. Antineoplastic Drugs: Alkylating agents, Antimetabolites, Radio active Isotopes, Vinka Alkaloids, Anti Cancerous antibiotics.	2 hours
h. Drug Therapy of Tuberculosis, Leprosy & Malaria.	3 hours
8. Other drugs : Enumeration of clinically used agents, general uses along with dental uses if any and specific adverse effects of :	
a. Antihistamines and antiemetics	2 hours
b. Drugs used in bronchial asthma and cough	1 hour
c. Drugs used in peptic ulcer	2 hours
d. Chelating agents - BAL, EDTA & Penicillamine.	1 hour
e. Anthelmenthics	2 hours
9. Dental Pharmacology	
A. a. Fluoride pharmacology	1 hour
b. Antiseptics, astringents & Sialogogues	1 hour
c. Obtundents, Mummifying agents and disclosing agents.	1 hour

B. Prevention and drug therapy of emergencies in dental practice.	2 hours
a. Seizures	
b. Anaphylaxis	
c. Severe bleeding	
d. Shock	
e. Tetany	
f. Status asthmaticus	
g. Acute Addisonian crisis	
h. Diabetic Ketoacidosis	

PRACTICALS : 20 Hrs.

1. Introduction - equipments used in dispensing pharmacy, prescription - parts and model prescription.	2 hours
2. Demonstration of common dosage forms used in clinical practice.	2 hours
3. Mixtures - one example (Expectorant/Salicylate) of simple and diffusible (Bismuth Kaolin/chalk) mixtures.	2 hours
4. Emulsion - Types and example (Liniment turpentine/ Shark liver oil) of emulsion.	2 hours
5. Powders - tooth powder	2 hours
6. Mandl's paint/Gum paint percentage dilution - concept and calculations with suitable examples.	2 hours
7. Mouth washes - Alkaline, antiseptic, astringent.	2 hours
8. Tooth pastes	2 hours
9. Prescription writing for 15 general conditions commonly encountered in clinical practice. eg. Bronchial asthma, hypertension congestive heart failure, angina pectoris, peptic ulcer, bacillary dysentery, pseudomembranous colitis, diabetes mellitus, diabetic coma osteoarthritis, anaphylaxis, status asthmaticus, Status epilepticus, iron deficiency & pernicious anaemia.	2 hours
10. Dental prescriptions for about fifteen dental conditions commonly encountered in practice eg. Acute necrotising ulcerative. gingivitis, acute herpetic gingivitis/stomatitis, acute gingival abscess, pericoronal abscess (impacted teeth), dental caries, aphthous ulcers, hypersensitive dentine, dentoalveolar abscess, xerostomia, acute tooth ache, post operative pain, post extraction pain with swelling, oral candidiasis, scurvy etc.	2 hours

Scheme of Examination

A. Theory (Written) Examination : 70 Marks

Type of questions, topics and marks distribution

Contents	Type of Questions and Marks	Marks
<p>Topics to be covered :</p> <p>One long essay from dental pharmacology</p> <p>Second long essay from:</p> <ul style="list-style-type: none"> - Pharmacokinetics - Pharmacodynamics - Antibiotics - NSAIDs - Local anesthetics - Anti coagulants - Beta blockers - Glucocorticoids - Calcium channel blockers - ACE Inhibitors - Opioid Analgesics - Sympathomimetics - Anti-Cholinergics - Cardiac Glycosides 	<p>Long Essay</p> <p>2 x 10 = 20 marks</p>	20
<p>For Short notes</p> <p>Please refer chapters at sl. no. I, 1 b, c, d, e, 2 b, 3 B, 4 b, d, e., 5, 6 a, 7 e, f, g., 8, 9. A. b, c, 9. B.</p> <p>Compare and contrast type from</p> <ul style="list-style-type: none"> - Physostigmine and Neostigmine - Atropine and Scopolamine - Procaine and Cocaine - Heparin and Dicoumoral - Iron Dextran and Iron Sorbitol Citric Acid complex - Digoxin and Digitoxin - Frusemide and Spiranolactone / Triamterene 	<p>Short essay type</p> <p>Short notes 06 x 5 = 30 marks</p> <p>Compare and contrast 02 x 5 = 10 marks</p>	40
<p>To classify the drug and write its mechanism of action or adverse effect or clinical use or specific antidote indicated in its poisoning, if any.</p>	<p>Short Answer type</p> <p>05x 02= 10 marks</p>	10
	TOTAL	70

B. Viva Voce : 20 Marks

C. Internal Assessment – Theory : 10 marks, Practicals : 10 marks

D. Practicals : 90 Marks

1. Spotters 10 nos. x 1 = 10 marks
2. Prescriptions 2 nos. (10+10 marks) = 20 marks
(one medical plus one dental prescription)
3. Preparations 2 nos.x 30 marks = 60 marks
(one medical plus one dental preparation)

TEXT BOOKS RECOMMENDED :

Name of the Book	Author	Edn	Yr. of Publ.	Place of Publ. Publ.'s Name	Price
1. R.S.Satoskar and S.D.Bhandarkar	Pharmacology and Pharmacotherapeutics	16 th	1993	Bombay Popular Prakashan	Rs. 375/-
2. Tripathi K.D.	Essentials of Medical Pharmacology	4 th	1994	New Delhi Jaypee Brothers Medical Publishers	Rs. 400/-
3. Laurence D.R.	Clinical Pharmacology	8 th	1997	New York Churchill Livingstone	£ 11.00
4. Kartzung Betram G.	Basic and clinical Pharmacology	8 th	2001	USA Lange Medical Books	\$ 30.00
5. Seymour Robin A	Pharmacology and Dental Therapeutics	3 rd	1999	New York Oxford University Press	Rs. 1495/-
6. Cawson R.A.	Clinical Pharmacology in Dentistry	5 th	1989	New York Churchill Livingstone	£ 17.50

**II Year
BDS
Dental Material**

Theory - 60 Hrs.

Practical – 200 Hrs.

1	Chemistry of synthetic resins used in dentistry.	02
8	Dental porcelains - types, composition, role played by each ingredient, manipulation, advantages and disadvantages, aluminous, porcelain, castable porcelain, metal fused porcelain, and porcelain repair materials.	05
9	Tooth restorative materials - Classification and ideal properties : b. Cavity bases, liners and varnishes. c. Restorative resins - Brief history of resins as tooth restorative materials, filled resins (composite resins) - classification, chemistry of setting, composition, properties, uses, manipulation advantages and disadvantages, acid etching, bonding agents (Enamel and dentin banding systems), Pit and fissure sealants.	12
9.	Direct filling Gold - types, advantages, disadvantages, brief study of manipulation (cold welding).	03
10.	Silver amalgam alloy - Brief history, classification, composition, role played by each ingredient, setting reaction, properties, manipulation and uses, comparative study of all types of silver amalgams Mercury Hygiene and Toxicity	04
11.	Casting gold alloys - Classification, corrosion, contents and role played by each ingredient, indications, white gold, uses,	03
12.	Dental casting investments - (Refractory materials) Classification, composition, setting reaction, manipulation and technical consideration.	03
13.	Casting procedures and casting defects, in general	04
14.	Base metal casting alloys - properties, composition and uses of Co-Cr, St. steel.	04
15.	Materials used in orthodontia - Luting cements, direct banding agents, St. Steel, properties and gauzes of wires of gold, st. steel, Co-Cr and titanium alloys, brackets, sensitization.	06
16.	Abrasives and polishing agents - a. Clinical b. Laboratory.	04
17.	Dental implant materials - History, biological properties and different designs.	02
18.	Miscellaneous - Desirable to know: a. Infection control b. Artificial tooth material. c. Separating media d. Die spacers e. Tray adhesives f. Petroleum jelly g. Articulating paper h. Pressure indicating paste i. Endodontic materials j. Comparative studies between metallic and nonmetallic denture	08

	base.	
k.	Bioglass	
l.	Sprues	
m.	Setting expansion, hygroscopic expansion, thermal expansion	
n.	Dentifrices.	

Practical Exercises : 200 Hours

I Demonstration of manipulation of all materials for a batch not more than 8 students.

II Exercises to be done by each student:

a. Manipulation and pouring impressions - identify setting time and working time and working time with reference to proportion, water temp, and spatulation time. -

b. Self-cure and heat cure acrylic resin manipulation and curing. -

c. Cements - manipulation and studying setting time and working time for luting, base and restoration. -

d. Silver Amalgam - manipulation, trituration, condensation and studying setting and working time. -

Scheme of Examination

A. Theory : 70 Marks

Distribution of Topics and Type of Questions :

Contents	Type of Questions and Marks	Marks
<i>Conservative Dentistry Topics</i>	Long Essays 1 x 10 marks	10
Prosthodontics topics	Long Essays 1 x 10 marks	10
Conservative and Prosthetic topics (Four questions from each subject)	Short Essays 8 x 5 marks	40
Orthodontia	Short Essays 2 x 2 marks	04
Conservative and Prosthetics topics (Five questions from each subject)	Short Answers 03 x 2 marks	06
	Total	70

B. Viva Voce : 20 Marks

C. Internal Assessment – Theory : 10 marks, Practicals: 10 marks

D. Practicals : 90 Marks

1. **Spotters:** Identify and write the composition and two important uses:

Spotters-25 Nos.

Marks - 01 Each

Time - 02 Minutes each - 25 Marks

2. **Exercise No. 1** - 20 Marks
Any one exercise of the following:
- Manipulation of impression compound and preparation of a plaster cast of U/L arch.
 - Manipulation of alginate impression material and preparation of plaster cast of U/L arch.
 - Manipulation of Zinc Oxide Eugenol impression paste, and preparation of cast of U/L arch.
 - Manipulation of Rubber Base impression material and preparation of Stone cast
3. **Exercise No. 2** - 20 marks
Manipulation of any one of the following Dental Cements.
- ZOE (Luting and Filling consistency)
 - Zinc Phosphate Cement (Luting and Base consistency)
 - Silicate Cement (Filing consistency)
 - Glass Ionomer Cement Type I/II (Luting/Filling consistency)
 - Polycarboxylate Cement (Luting consistency).
- (Cements which are mixed for filling consistency should be filled in the cavity prepared in the extracted natural looth / typhodont.)
4. **Exercise No. 3** - 25 marks
- Trituration of Silver Amalgam and Condensation into the cavity prepared in extracted natural tooth/typhodont.
 - Mixing to heat cure Aerylie resin and recording of time taken for all stages.

Recommended Text Books

Title	Author	Edn.	Yr. of Publ.	Place of Publ.	Publ.'s Name	Price
5. Science of Dental Materials	Kennet. J. Anusavice	10 th	1996	USA	W.B. Sunder's Company	\$35.00
6. Notes on Dental Materials	E.C. Combe	06 th	1992	UK	Churchill Livingstone	4.95 pounds
7. Applied Dental Material	John. F. Mc. Cabe	07 th	1992	London	Oxford Blackwell Scientific pub.	Rs. 320/-
8. Text Book of Dental Material	Craip. O. Brien	06 th	1996	USA	Mosby	\$ 15.00

Pre-Clinical Conservative Dentistry

Theory : 25 Hours

1. Introduction to Conservative Dentistry.	1 hour
2. Definition, Aim & Scope of Conservative Dentistry & Endodontics	
3. Classification of Cavities.	1 hour
4. Nomenclature.	
5. Various chair side positions.	1 hour
6. Tooth Numbering.	
7. Restoration - Definition & Objectives	
8. Instruments - Classification, Nomenclature, Design, Formula of hand cutting instruments, Care, Grasps and Rests.	4 hours
9. Rotary Cutting instruments - Burs, Design & use. Various speeds in Cavity preparation.	2 hours
10. Principles of cavity /Tooth preparation for : a. Silver Amalgam b. Cast gold inlay c. Composite resins. d. Glass Ionomer	5 hours
11. Matrices, Retainers, Wedges.	2 hours
12. Separators - different methods of separation.	2 hours
13. Finishing & polishing of restorations.	1 hours
14. Management of deep carious lesions - pulp capping and pulpotomy.	3 hours
15. Access cavity and brief introduction of root canal instruments.	3 hours

PRACTICAL EXERCISES – 200 Hours

Preparation of 1" cube in Plaster of paris - 6 Nos.
Preparation of geometric cavities in the above cubes.

Preparation of Tooth models in plaster and preparation of cavities and restoration with modeling wax.

- a. Incisors - 4 Nos.
- b. Pre-Molars - 2 Nos.
- c. Molars - 8 Nos.

30 Hours

(Upper & Lower)

Preparation of Cavities on Typhodont and/or Extracted Natural Teeth

I. CAVITIES PREPARATION

RESTORATION

Class I	6 with 2 extensions	4	25 Hours
Class II	5 DO Conventional 5 MO	8	25 Hours
	5 Conservative	4	15 Hours
	2 MOD (1 Upper molar) (1 Lower Molar)	1	15 Hours
Class III	3	All	15 Hours
Class V	3 on Anteriors	All	15 Hours
	2 on Posteriors	All	15 Hours

II. INLAY PREPARATION :

Class I	1	To prepare Wax patterns	
Class II	2+1 MOD	To prepare wax patterns and one to be casted	15 Hours
Class V	1 (posterior)		

III. CUSPAL PREPARATION : (Demonstration)

IV. a. Pulp capping : Direct/ Indirect on extracted teeth

b. Pulpotomy on extracted posterior teeth

c. Root canal access cavity opening on Upper Central incisor. (Extracted Tooth)

V. Demonstration of Light cure composite and Glass Ionomer Restorations.

VI. Demonstration of Instrumentation and Obturation of root canal.

VII. Demonstration - Wax pattern, investing, casting, polishing and cementation of cast restoration.

30 Hours

NOTE: The II year student should complete the prescribed quota of work before appearing for final internal assessment for the subject. This should be certified by the Head of the department before the candidate takes up final internal assessment exam.

Scheme of Examination

A. University Practicals : 60 Marks

Practical Exercise No.1 : 10 Marks

Spotters : 10 Nos., Marks : 01 Each, Time : 02 Minutes Each

Spotters

- Hand instruments used to prepare cavity and restoration
- Identification of Root Canal Instruments

Practical Exercise No.2 : 50 Marks

Preparation of Class II Conventional Cavity for Silver Amalgam in Maxillary or Mandibular I or II Molar tooth (Typhodont/Natural Tooth)

Cavity preparation	45 Minutes	25 Marks
Lining and Matrix	15 Minutes	10 Marks
Filling and carving	30 Minutes	15 Marks

B. University Viva-Voce : 20 Marks

C. Internal Assessment : 20 Marks

Total : 100 Marks

TEXT BOOKS RECOMMENDED :

Name of the Book & Title	Author	Edn	Yr. of Publ.	Place of Publ.	Publ.'s Name	Price
1. The Art and Science of Operative Dentistry	Sturdevant	3 rd	1997	USA	Mosby	\$ 30.00
2. Principles & Practice of Operative Dentistry	Charbeneu	3 rd	1989	Bombay	Varghese Publication	Rs. 315/-
3. Endodontic Practice	Grossman	--	1988	Bombay	Varghese Publication	Rs. 323/-

II B.D.S
Pre-Clinical Prosthodontics

THEORY : 25 hrs, PRACTICALS -200 hrs 10 hrs/week]

I. Introduction to Prosthodontics – Scope and Definition	
A. Masticatory apparatus and function: 1. Maxillae & Mandible with & without teeth. 2. Muscles of mastication and accessory muscles of mastication. 3. Brief anatomy of TMJ. 4. Mandibular movements. 5. Functions of teeth.	Must Know 2 hrs
B. Various branches of Prosthodontics and prosthesis: 1. Scope & limitation. 2. Appliances v/s prosthesis. 3. Dental prosthesis v/s non-dental prosthesis.	Must Know 1 hr
C. Effect of loss of teeth: 1. On general health. 2. On masticatory apparatus. 3. Need of replace lost teeth.	Must Know 1 hr
D. Outline of Prosthodontics: 1. Types of Prosthesis. 2. Requirements of prosthesis- Physical, biological, esthetic considerations.	Must Know 1 hr
II. Introduction to components of Prosthesis	
A. Complete Denture Prosthesis: 1. Various surfaces (Border and surface anatomy). 2. Components – Base and Teeth.	Must Know 1 hrs
B. Removable Partial Denture: 1. Classification. 2. Major and minor Connectors. 3. Direct retainers. 4. Rests. 5. Indirect retainers. 6. Denture base. 7. Artificial teeth.	Must Know 2 hrs
C. Fixed Partial Denture: 1. Classification. 2. Retainers. 3. Pontics. 4. Connectors.	Must Know 1 hr

III. All related definitions and terminologies from glossary <ul style="list-style-type: none"> ❖ Model ❖ Cast ❖ Impression ❖ Occlusion rim ❖ Temporary denture base ❖ Permanent denture base ❖ Occlusion ❖ Jaw relation – orientation, vertical and centric ❖ Christensen's phenomenon ❖ Key of occlusion ❖ Balanced occlusion ❖ Abutment etc... 	Must Know 1 hr
IV. Introduction to mouth preparation – in brief A. Complete Dentures <ol style="list-style-type: none"> 1. General considerations 2. Pre-prosthetic surgery 	Must Know 1 hr
B. Removable partial dentures <ol style="list-style-type: none"> 1. General considerations 2. Occlusal rest preparation 3. Modifying contours of the abutments 4. Guide planes 5. Elimination of undercuts 	Desirable to Know 1 hr
C. Fixed Partial Dentures <ol style="list-style-type: none"> 1. Principles of tooth preparation – in brief 2. Retainers in brief 	Desirable to Know
V. Introduction to all steps involved in fabrication of Prosthesis	Must Know 1 hrs

Clinical Steps in brief and laboratory steps in detail

Impression Making <ol style="list-style-type: none"> 1. Definition and requirements and types of impressions 2. Various materials used for different impressions 3. Different theories of impression making 	Must Know 2 hrs
Impression Trays <ol style="list-style-type: none"> 1. Definition, classification, materials, advantages and disadvantages 2. Selection of trays 3. Special trays 4. Spacer design 	Must Know 1 hr

<p>Introduction to jaw relation record</p> <ol style="list-style-type: none"> 1. Definition and type 2. Temporary denture base – Indications, Advantages, Disadvantages, materials used 3. Occlusion rims – materials, shape, dimensions 4. Clinical procedures of jaw relation recording in brief 	<p>Must Know 2 hrs.</p>
<p>Articulators and face bow</p> <ol style="list-style-type: none"> 1. Basic out line 2. Need for articulators 3. Definition, classification, parts, advantages, disadvantages of articulators 4. Definitions, classification, parts, advantages, disadvantages and purpose of face bow transfer 5. Demonstration of face bow transfer to an articulator on a dummy 	<p>Must Know 2 hrs.</p>
<p>Selection of Teeth</p> <ol style="list-style-type: none"> 1. Various guidelines for selection of teeth including dentogenic concept 2. Arrangement of teeth in detail with various factors of esthetics, overjet, overbite etc 	<p>Must Know 1 hr</p>
<p>Occlusion</p> <ol style="list-style-type: none"> 1. Balanced Occlusion – need and advantages 2. Various factors of balanced occlusion 	<p>Must Know 1 hrs</p>
<p>Try in Procedures</p> <ol style="list-style-type: none"> 1. Anterior try – in 2. Posterior try – in 3. Waxing, carvin, polishing and final try – in 	<p>Must Know 1 hr</p>
<p>Processing Procedures</p> <ul style="list-style-type: none"> ❖ Flasking ❖ Dewaxing ❖ Packing ❖ Curing ❖ Finishing and polishing of acrylic dentures 	<p>Must Know 1 hr</p>
<p>VI. Casting Procedures</p> <ul style="list-style-type: none"> ❖ Preparation of die ❖ Wax pattern ❖ Investing ❖ Burnout ❖ Casting ❖ Finishing and polishing 	<p>Desirable to Know 1 hrs</p>

II BDS PRACTICAL EXERCISES 200 hours

Arrangement of teeth

- Must Know

1. Surveying of partially edentulous models and preparing modified master cast
- Desirable to Know
2. Preparing of wax patterns spruing, casting and finishing (in batches of students not more than 8) - Desirable to Know
3. Preparation of plaster models of various preparation of teeth to receive retainers for FPD
- Desirable to Know
4. Prepare wax patterns for minimum of 3 unit FPD and investing, casting and porcelain facing (for Batch of 8 students) - Desirable to Know

Note:

1. Students shall submit one processed denture mounted on an articulator to present on university practical exam along with record book.
2. Exercises of RPD and FPD to be submitted in groups along with the record book.

Scheme of Examination**A. Practical Exercise: (Duration- 3 hrs) : 60 Marks**

Arrangement of teeth in class I relation, Waxing, Carving, Polishing

B. University Viva-Voce : 20 Marks**C. Internal Assessment : 20 Marks****RECOMMENDED TEXT BOOKS**

Sl. No	AUTHOR	TITLE	EDITION	YEAR OF PUBLN	PUBLISHERS NAME	PRICE
7.	Boucher	Prosthodontic Treatment of Edentulous Patients	XI	1997	Mosby St.Louis, Missouri, USA	\$ 76
8.	Heartwell	Syllabus of Complete Denture	IV	1992	Varghese Publishing House	Rs 595
9.	Tylman	Theory and Practice of Fixed Prosthodontics	VIII	1993	Ishiyaku Euro America Inc. 716, Hanley Industrial Court St. Louis Missouri, USA	\$ 69
10.	McCracken	Removable Partial Denture	VIII	1989	CBS Publishers & Distributors Shadara, Delhi	Rs 350
11.	Skinner	Science of Dental Materials	X	1996	W.B Saunders Company, Philadelphia, USA	\$ 35

12.	Craig	Dental Materials, Properties & Manipulation	VI	1996	Mosby St. Louis Missouri, USA	\$ 35
-----	-------	---	----	------	-------------------------------------	-------

II BDS

Oral Pathology and Microbiology

Theory : 25 Hours

Practical : 50 Hours

MUST KNOW

- 1) **Developmental Disturbances of oral and para oral structures : (15 hrs)**
 - a) Developmental disturbances of Jaws
 - Agnathia, Micrognathia, Macrognathia, Facial Hemihypertrophy, Facial Hemiatropy
 - b) Developmental Disturbances of lips and palate
 - Congenital Lip pits and Commissural pits and fistulas
 - Double lip, Cleft lip, cleft Palate, Chelitis Glandularis, Chelitis Granulomatosa, Hereditary Intestinal Polyposis, Hereditary Melanotic Macule
 - c) Developmental disturbances of Oral Mucosa
 - Fordyce's Granules
 - Focal epithelial Hyperplasia
 - d) Developmental disturbances of gingiva
 - Fibromatosis Gingiva, Retrocuspid Papilla
 - e) Developmental Disturbances of Tongue
 - Macroglossia, Microglossia, Ankyloglossia, Cleft Tongue, Fissured Tongue, Median Rhomboid Glossitis, Benign Migratory Glossitis, Hairy Tongue.
 - f) Development disturbances of oral lymphoid tissue:
 - Reactive lymphoid aggregates
 - Lymphoid hamartoma
 - Angiolymphoid Hyperplasia
 - Lympho-epithelial cyst
 - g) Developmental disturbances of salivary glands:
 - Aplasia, Xerostomia, Hyperplasia of the palatal glands, Atresia, Aberrancy, Stafine's cyst
 - h) Developmental disturbances in size of teeth:
 - Microdontia, Macrodontia
 - i) Developmental disturbances in the shape of the teeth:

- Fusion, Germination, Concrescence, Dilacerations, Talon's Cusp, Dens in Dente, Dens Evaginatus, Taurodontism, Supernumerary Roots, Enameloma
- j) Developmental Disturbances in number of teeth
 - Anodontia, Supernumerary teeth, Predeciduous and Post Permanent dentition
- k) Developmental Disturbances in Structure of Teeth:
 - Amelogenesis Imperfecta, Enamel Hypoplasia, Dentinogenesis Imperfecta, Dentinal dysplasia, Regional Odontodysplasia, Shell Teeth.
- l) Developmental Disturbances in eruption of teeth:
 - Premature Eruptions, Eruption Sequestrum, Delayed Eruption, Multiple Unerupted teeth, Submerged Teeth.
- m) Developmental / Fissural cysts of the Oral cavity
 - Median palatal cyst, Globulomaxillary cyst, Median Mandibular cyst, Naso-alveolar cyst, Palatal cyst of neonates, Thyroglossal duct cyst, Epidermoid, and Dermoid cyst, Nasopalatine cyst.

2) Dental Caries (5 hrs)

- Theories
- Clinical features
- Classification
- Histopathology
- Immunology
- Caries activity Tests
- Factors Influencing Caries

3) Diseases of the pulp and Periapical tissues (5 hrs)

- a) Diseases of the Dental Pulp
 - Pulpitis, Focal Reversible Pulpitis, Chronic Pulpitis, Pulp Polyp.
- b) Diseases of the Periapical Tissues
 - Periapical Granuloma, Periapical Abscess, Periapical Cyst
- c) Osteomyelitis
 - Acute Suppurative Osteomyelitis, Chronic Focal and Diffuse Sclerosing Osteomyelitis, Garre's Osteomyelitis

Practicals : 50 hours

Identification of Hard and Soft Tissue Specimens

Text Books Recommended :

Name of the Book	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
1. Oral pathology Clinical Pathologic Correlation	Regezi & Scuibia	2 nd	1989	W. B. Sauners Company USA	\$ 25
2. Text Book of Oral Pathology	William G. Shafer	4 th	1993	S. B. Saunders Company USA	Rs. 876/-
3. Colour atlas of Oral Pathology	John Everson & Crispan Scully		1995	Mosby	\$ 70
4. Oral diseases in the Tropics	Prabu, Wilson, Duftry, Johnson	1 st	1992	-- Oxford University Press	Rs. 400/-

Other suggested reading

1. Pathology of Tumors-Lucas
2. Oral Immunology - Lehner