Sankalchand Patel University, Visnagar

Curriculum and Examinations Regulation

1st MBBS BIOCHEMISTRY

General Information

Name of the course: BACHELOR OF MEDICINE AND BACHELOR OF SURGERY

Short Title: MBBS Course

Duration of Course:

Total Duration: 4½ Years + 1 yearinternship.

			Subjects	Duration
1	First MBBS		(1) HumanAnatomy (2) HumanPhysiology (3) Biochemistry	1 Year
2	Second MBBS		(1) Pathology (2) Microbiology (3) Pharmacology (4) ForensicMedicine	1½ Years
3	Third MBBS	Part I	(1) Ophthalmology (2) Oto-Rhino-Laryngology (ENT) (3) CommunityMedicine	1 Year
		Part II	(1) Medicine (2) GeneralSurgery (3) Obstretrics&Gynecology (4) Paediatrics	1 Year
			Total	4½ Years
4	Internship			1 Year

Admission Criteria for MBBSCourse:

The Medical Council of India is the apex body for regulations of MBBS studies in India. The Graduate Medical Act 1997, describes details of eligibility, competitive examination and admission rules. It also publishes Amendments thereof from time to time in the Gazette of India. (www.mciindia.org) In accordance with the above MCI act the Government of Gujarat has issued notification NO. GP-11-MCG-1008-931-J & NO. GP-16- MCG-2009-810396-J: for the admission in medical courses in the state of Gujarat.

In exercise of the powers conferred by sub-section (1) of section 20 read with section 4 of the Gujarat Professional Medical Educational Colleges or Institutions (Regulation of Admission and Fixation of Fees) Act, 2007 (Guj.3 of 2008) and in super session of all the rules made in this behalf, the Government of Gujarat hereby makes the following rules to regulate admission to the first year of the Professional Medical Educational Courses and payment of fees through.

The ADMISSION COMMITTEE FOR PROFESSIONAL MEDICAL EDUCATIONAL COURSES,
C/o. DEAN, B.J. MEDICAL COLLEGE
AHMEDABAD – 380 016

Website :www.medadmbjmc.in

ADMISSION, SELECTION, MIGRATION & TRAINING:-

Admission to the Medical Course - Eligibility Criteria : No Candidate shall be allowed to be admitted to the Medical Curriculum proper of first Bachelor of Medicine and Bachelor of Surgery (MBBS) Course until:

(1) He/she shall complete the age of 17 years on or before 31st December of the year of admission to the MBBSCourse.

(2) He/she has passed qualifying examination asunder:

(a) The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of physics, Chemistry, Biology and Mathematics or any other elective subjects with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee oneducation.

Note:-Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the Medical colleges.

or

(b) The Intermediate examination in science of an Indian University/Board or other recognized examining body with Physics, Chemistry and Biology which shall include a practical test in these subjects and also English as a compulsorysubject.

or

(c) The pre-professional/pre-medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school examination, or the pre-university or an equivalent examination. The pre- professional/pre-medical examination shall include a practical test in Physics, Chemistry & Biology and also English as a compulsorysubject.

or

(d) The first year of the three years degree course of a recognized university, with Physics, Chemistry and Biology including a practical test in these subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a corecourse.

or

(e) 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) and further that he/she has passed the earlier qualifying examination with the following subjects - Physics, Chemistry, Biology andEnglish.

or

(f) Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including practical test in each of these subjects andEnglish.

Note: - The pre-medical course may be conducted either at Medical College or a Science College. Marks obtained in mathematics are not to be considered for admission to MBBS course. After the 10+2 course is introduced, the integrated courses should be abolished.

3. 3% seats of the annual sanctioned intake capacity shall be filled up by candidates with locomotory disability of lower limbs between 50% to70%.

Provided that in case any seat in this 3% quota remains unfilled on account of unavailability of candidates with locomotory disability of lower limbs between 50% to 70% then any such unfilled seat in this 3% quota shall be filled up by persons with locomotory disability of lower

limbs between 40% to 50% - before they are included in the annual sanctioned seats for General Category candidates.

Provided further that this entire exercise shall be completed by each medical college / institution as per the statutory time schedule for admissions and in no case any admission will be made in the MBBS course after 30th ofSeptember.

Selection to Students:-The selection of students to medical college shall be based solely on merit of the candidate and for determination of merit, the following criteria be adopted uniformly throughout the country:

(1) In states, having only one Medical College and one university / board/examining body conducting the qualifying examination, the marks obtained at such qualifying examination may be taken into consideration.

(2) In states, having more than one university/board/examining body conducting the qualifying examination (orwherethereismorethanonemedicalcollegeundertheadministrativecontrolofoneauthority)acompetitive entrance examination should be held so as to achieve a uniform evaluation as there may be variation of standards at qualifying examinations conducted by different agencies.

(3) Where there are more than one college in a state and only one university/board conducting the qualifying examination, then a joint selection board be constituted for all thecolleges.

(4) A competitive entrance examination is absolutely necessary in the cases of Institutions of All India character.

(5) Procedure for selection to MBBS course shall be as follows:-

(i) In case of admission on the basis of qualifying examination under Clause(1) based on merit, candidate for admission to MBBS course must have passed in the subjects of Physics, Chemistry, Biology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry, and Biology at the qualifying examination as mentioned in Clause(2) of regulation 4. 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.

(ii) In case of admission on the basis of competitive entrance examination under Clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry, Biology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry & Biology at the qualifying examination as mentioned in Clause (2) of Regulation 4 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 the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as statedabove.

Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the MBBS course, he shall not be admitted to that course until he fulfils the eligibility criteria under Regulation 4.

Migration:-

(1) Migration of students from one medical college to another medical college may be granted on any genuine ground subject to the availability of vacancy in the college where migration is sought and fulfilling the other requirements laid down in the Regulations. Migration would be restricted to 5% of the sanctioned intake of the college during the year. No migration will be permitted on any ground from one medical college to another located within the samecity.

(2) Migration of students from one College to another is permissible only if both the colleges are recognised by the Central Government under section 11(2) of the Indian Medical Council Act,1956

and further subject to the condition that it shall not result in increase in the sanctioned intake capacity for the academic year concerned in respect of the receiving medicalcollege.
(3) The applicant candidate shall be eligible to apply for migration only after qualifying in the first professional MBBS examination. Migration during clinical course of study shall not be allowed on anyground.
(4) For the purpose of migration an applicant candidate shall first obtain "No Objection Certificate" from the college where he is studying for the present and the university to which that college is affiliated and also from the college to which the migration is sought and the university to it that college is affiliated. He/She shall submit his application for migration within a period of 1 month of passing (Declaration of result of the 1st Professional MBBS examination) along with the above cited four "No Objection Certificates" to: (a) the Director of Medical Education of the State, if migration is sought from one college to another within the same State or (b) the Medical Council of India, if the migration is sought from one college to another located outside theState.
(5) A student who has joined another college on migration shall be eligible to appear in the IInd professional MBBS examination only after attaining the minimum attendance in that college in the subjects, lectures, seminars etc. required for appearing in the examination prescribed under Regulation12(1)
Note-1:The State Governments/Universities/Institutions may frame appropriate guidelines for grant of No Objection Certificate or migration, as the case may be, to the students subject to provisions of these regulations.
Note-2:Any request for migration not covered under the provisions of these Regulations shall be referred to the Medical Council of India for consideration on individual merits by the Director (Medical Education) of the State or the Head of Central Government Institution concerned. The decision taken by the Council on such requests shall be final.
Note-3:The College/Institutions shall send intimation to the Medical Council of India about the number of students admitted by them on migration within one month of their joining. It shall be open to the Council to undertake verification of the compliance of the provisions of the regulations governing migration by the Colleges at any point of time."

TRAINING PERIOD AND TIME DISTRIBUTION

(1) Every student shall undergo a period of certified study extending over 4 ½ academic years divided into 9 semesters,(i.e. of 6 months each) from the date of commencement of his study for the subjects comprising the medical curriculum to the date of completion of the examination and followed by one year compulsory rotating internship. Each semester will consist of approximately 120 teaching days of 8 hours each college working time, including one hour oflunch.
(2) The period of 4 ½ years is divided into three phases as follows:-

(a) **Phase-1** (two semesters) - consisting of Pre-clinical subjects (Human Anatomy, Human Physiology, Bio- chemistry and introduction to Community Medicine including Humanities). Besides 60 hours for introduction to Community Medicine including Humanities, rest of the time shall be somewhat equally divided between Anatomy and Physiology plus Biochemistry combined (Physiology 2/3 & Biochemistry1/3).

(b)**Phase-II** (3 semesters) - consisting of para-clinical/ clinicalsubjects.

During this phase teaching of para-clinical and clinical subjects shall be done concurrently.

The para-clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicineincluding Toxicology and part of CommunityMedicine.

The clinical subjects shall consist of all those detailed below in Phase III.

Out of the time for Para-clinical teaching approximately equal time be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine & 2/3 Community Medicine). See Appendix-C.

(c)**Phase-III** (Continuation of study of clinical subjects for seven semesters after passingPhase-I)

The clinical subjects to be taught during Phase II & III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynaecology and Community Medicine.

Besides clinical posting as per schedule mentioned herewith, rest of the teaching hours be divided for didactic lectures, demonstrations, seminars, group discussions etc. in various subjects. The time distribution shall be as per Appendix-C.
The Medicine and its allied specialties training will include General Medicine, Paediatrics, Tuberculosis and Chest, Skin and Sexually Transmitted Diseases, Psychiatry, Radio-diagnosis, Infectious diseases etc. The Surgery and its allied specialties training will include General Surgery, Orthopaedic Surgery including Physio-therapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics &Gynaecology training will include family medicine, family welfare planning etc.

(3) The first 2 semester (approximatly 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care. No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he has passed in all the Phase I (Pre-clinicalsubjects).
(4) After passing pre-clinical subjects, 1 ½ year (3 semesters) shall be devoted to para-clinical subjects. Phase II will be devoted to para-clinical & clinical subjects, along with clinical postings. During clinical phase (Phase III) pre-clinical and para-clinical teaching will be integrated into the teaching of clinical subjects whererelevant.
(5) Didactic lectures should not exceed one third of the time schedule; two third schedule should include practicals, clinicals or/and group discussions. Learning process should include living experiences, problem oriented approach, case studies and community health careactivities.
(6) Universities shall organize admission timings and admission process in such a way that teaching in first semester starts by 1st of August eachyear.
(7) Supplementary examination may be conducted within 6 months so that the students who pass can join the main batch and the failed students will have to appear in the subsequentyear.

Phase Distribution and Timing of Examinations:

	Semester(Each of6 months)			TotalDuration (Years)	Comment
Ist MBBS	1st	2nd	-	1	Ist professional Examination (during second semester)
IInd MBBS	3rd	4th	5th	1 ½	IInd professional examination (during fifth semester)
IIIrd MBBS Part I	6th	7th	-	2	IIIrd professional Part I (during 7th semester)
IIIrd MBBS Part II	8th	9th	-		IIIrdprofessional Part II(Final professional)
				4 ½	
Internship				1	-

Note:-
a) Passing in Ist Professional is compulsory before proceeding to Phase IItraining.
b) Astudent whofails intheIInd professionalexamination,willnotbeallowedtoappearIIIrdProfessional Part I examination unless he passes all subjects of IInd Professionalexamination.
c) Passing in IIIrd Professional (Part I) examination is not compulsory before entering for 8th & 9th semester training, however passing of IIIrd Professional (Part I) is compulsory for being eligible for IIIrd Professional (Part II)examination.

CURRICULUM (1st MBBS SUBJECTS)

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Prescribed Teaching Hours and Suggested Model Time Tables:-

Following minimum teaching hours are prescribed in various disciplines:

A. **Pre-Clinical Subjects :**(Phase-1-First and SecondSemester)

Anatomy	**650Hrs.**
Physiology	**480 Hrs.**
Biochemistry	**240 Hrs.**
CommunityMedicine	**60Hrs.**

Pre-clinical subjects - Phase I : In the teaching of these subjects stress shall be laid on basic principles of the subjects with more emphasis on their applied aspects.

Subject(3) BIOCHEMISTRY

Biochemistry including medical physics and Molecular Biology.

(i) GOAL

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinicalproblems.

(ii) OBJECTIVES

(a) KNOWLEDGE

At the end of the course, the student should be able to :

(1) describe the molecular and functional organization of a cell and list its subcellular components;
(2) delineate structure, function and inter-relationships of biomolecules and consequences of deviation fromnormal;
(3) summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity isaltered;
(4) describe digestion and assimilation of nutrients and consequences ofmalnutrition;
(5) integrate the various aspects of metabolism and their regulatorypathways;
(6) explain the biochemical basis of inherited disorders with their associatedsequelae;
(7) describe mechanisms involved in maintenance of body fluid and pHhomeostasis;
(8) outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application inmedicine;
(9) summarize the molecular concepts of body defence and their application inmedicine;
(10) outline the biochemical basis of environmental health hazards, biochemical basis of cancer andcarcinogenesis;
(11) familiarize with the principles of various conventionaland specialized laboratory investigations and instrumentation analysis and interpretation of a givendata;
(12) the ability to suggest experiments to support theoretical concepts and clinicaldiagnosis.

b. SKILLS:

At the end of the course, the student should be able to :

(1) make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening anddiagnosis;
(2) analyze and interpret investigativedata;
(3) demonstrate the skills of solving scientific and clinical problems and decisionmaking;

c. INTEGRATION

The knowledge acquired in biochemistry should help the students tointegrate molecular events with structure and function of the human body in health anddisease.

Syllabus (Biochemistry)

1. Cellmembrane,
2. Chemistry and metabolism of Fat and Carbohydrates andproteins,
3. Enzymes BodyFluids.
4. pH buffers. Acid base balance andregulation,
5. Biologicaloxidation,Body defense mechanism And its application inmedicine.
6. Environmental Biochemistry and CancerBiochemistry,
7. Organ Function Tests, NewerTechniques.
8. Protein chemistry andMetabolism,
9. Nucleic andTranscription,
10. Replication,
11. Molecular Biology, Genetic EngineeringBio-Technology,
12. Integration of Metabolism,
13. Purine, Pyrimidine Chemistry, And Metabolism,
14. Vitamins, Minerals andNutrition.

EXAMINATIONS REGULATIONS

EXAMINATIONS REGULATIONS

ESSENTIALITIES FOR QUALIFYING TO APPEAR IN PROFESSIONAL EXAMINATIONS

The performance in essential components of training are to be assessed, based on:

(1) Attendance

75% of attendance in a subject for appearing in the examination is compulsory inclusive of attendance in non lecture teaching. i.e. seminars, group discussions, tutorials, demonstrations, practicals, Hospital (Tertiary, Secondary, Primary) postings and bed side clinics, etc.

(2) Internal Assessment:

(i) It shall be based on day to day assessment (see note), evaluation of student assignment, preparation for seminar, clinical case presentationetc.:
(ii) Regular periodical examinations shall be conducted throughout the course. The questions of number of examinations is left to theinstitution:
(iii) Day to day records should be given importance during internal assessment:
(iv) Weightage for the internal assessment shall be 20% of the total marks in each subject:
(v) Student must secure at least 35% marks of the total marks fixed for internal assessment in a particular subject in order to be eligible to appear in final university examination of that subject.

Note:-
Internal assessment shall relate to different ways in which students participation in learning participation in learning process during semesters in evaluated.

Some examples are as follows:

(i) Preparation of subject for studentsseminar.
(ii) Preparation of a clinical case fordiscussion.
(iii) Clinical case study/problem solvingexercise.
(iv) Participation in Project for health care in the community (planning stage toevaluation).
(v) Proficiency in carrying out a practical or a skill in small researchproject.
(vi) Multiple choice questions (MCQ) test after completion of asystem/teaching.

Each item tested shall be objectively assessed and recorded. Some of the items can be assigned as Home work/Vacationwork.

UNIVERSITY EXAMINATIONS :

Theory papers will be prepared by the examiners as prescribed. Nature of questions will be short answer type/objective type and marks for each part indicated separately.

Practicals/clinicals will be conducted in the laboratories or hospital wards. Objective will be assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases not esoteric syndromes or rare disorders. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation.

Viva/oral includes evaluation of management approach and handling of emergencies. Candidate's skill in interpretation of common investigative data, x-rays, identification of specimens, ECG,etc. also is to beevaluated.

The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary for knowledge, minimum skills alongwith clear concepts of the fundamentals which are necessary for him to carry out his professional day to day work competently. Evaluation will be carried out on an objective basis.

Question papers should preferably be of short structure/objective type.

Clinical cases/practicals shall take into account common diseases which the student is likely to come in contact in practice. Rare cases/obscure syndromes, long cases of neurology shall not be put for finalexamination.

During evaluation (both Internal and External) it shall be ascertained if the candidate has acquired the skills as detailed in Appendex-B.

There shall be one main examination in a year and a supplementary to be held not later than 6 months after the publication of its results. Universities Examinations shall beheld as under:-

First Professional:-

In the second Semester of Phase 1 training, in the subjects of Anatomy, Physiology and Bio- Chemistry.

Second Professional:-

In the Fifth Semester of Phase II training, in the subjects of Pathology, Microbiology, Pharmacy and Forensic Medicine.

Third Professional :-

Part 1- in the Seventh Semester of Phase III, in the subjects of Ophthamology, Oto-rhyno-laryngology and Community Medicine.

Third Professional :-

Part II-(Final Professional) – At the end of Phase III training in the subjects of Medicine, Surgery, Obstetrics & Gynecology and Pediatrics.

Note :-

Results of all university examinations shall be declared before the start of teaching for next semester.

DISTRIBUTION OF MARKS TO VARIOUS DISCIPLINES :

(A) FIRST PROFESSIONAL EXAMINATION:(Pre-clinicalSubjects):-

(a) Anatomy:

Theory-Two papers of 50 marks each	
(One applied question of 10 marks ineachpaper)	100 marks.
Oral(Viva)	20marks
Practical	40marks
Internal Assessment	
(Theory-20;Practical-20)	40marks
Total	200marks

(b) Physiology

Theory-Two papers of 50 marks each	
(One applied question of 10 marks ineachpaper)	100 marks
Oral(Viva)	20marks
Practical	40marks
Internal Assessment	
(Theory-20;Practical-20)	40marks
Total	200marks

(c) Biochemistry:

Theory-Two papers of 50 marks each	
(One applied question of 10 marks ineachpaper)	100marks
Oral(Viva)	20marks
Practical	40marks
Internal Assessment	
(Theory-20;Practical-20)	40marks
Total	200marks

Pass: In each of the subjects, **a candidate must obtain 50% in aggregate with a minimum of 50% in Theory including orals and minimum of 50% in Practicals.**

APPOINTMENT OF EXAMINERS:

(1) No person shall be appointed as an examiner in any of the subjects of the Professional examination leading to and including the final Professional examinations for the award of the MBBS degree unless he has taken at least five years previously, a doctorate degree of a recognized university or an equivalent qualification in the particular subject as per recommendation of the Council on teachers' eligibility qualifications and has had at least five years of total teaching experience in the subject concerned in a college affiliated to a recognized university at a facultyposition.

(2) There shall be at least four examiners for 100 students, out of whom not less than 50% must be external examiners. Of the four examiners, the senior most internal examiner will act as the Chairman and co-ordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained. Where candidates appearing are more than 100, one additional examiner, for every additional 50 or part thereof candidates appearing, beappointed.

(3) Non medical scientists engaged in the teaching of medical students as whole time teachers, may be appointed examiners in their concerned subjects provided they possess requisite doctorate qualifications and five year teaching experience of medical students after obtaining their postgraduate qualifications. Provided further that the 50% of the examiners (Internal & External) are from the medical qualificationstream

(4) External examiners shall not be from the same university and preferably be from outside the state.

(5) The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in hissubject.

(6) A university having more than one college shall have separate sets of examiners for each college, with internal examiners from the concernedcollege.

(7) External examiners shall rotate at an interval of 2years.

(8) There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate thequestions.

(9) Except Head of the department of subject concerned in a college/institution, all other with the rank of reader or equivalent and above with requisite qualifications and experience shall be appointed internal examiners by rotation in their subjects; provided that where there are no posts of readers, then an Assistant Professor of 5 years standing as Assistant Professor may be considered for appointment asexaminer.

(10) The grace marks up to a maximum of five marks may be awarded at the discretion of the University to a student who has failed only in one subject but has passed in all other subjects.

Guidelines for Papersetter

1. There will be 2 papers. Paper I & paper II each contains – section I & sectionII.
2. Time is 3hours
3. Paper setter should strict to course content & avoid duplication in different –paper & sections.
4. The question should be set in such a way that in should be completed withintime.
5. As far as possible paper setter should write questions legibly in his own handwriting & avoid overwriting.
6.
7. The blue print of curriculum & section wise break of mark allotted isappended.

Subject 3. Biochemistry

<u>BIOCHEMISTRY</u>: DISTRIBUTION OF TOPICS IN

PAPER I & II PARER - I

Cell membrane, chemistry and metabolism of Fat and Carbohydrates and porphyrins, Enzymes Body Fluids, pH buffers. Acid-base balance and regulation,Biological oxidation, Body defense mechanism and its application in medicine. Environmental Biochemistry and Cancer Biochemistry, Organ Function Tests, Newer Techniques.

PAPER – II

Protein chemistry and Metabolism, Nucleic acids and Transcription, Replication, Molecular Biology, Genetic Engineering, Bio-Technology, Integration of Metabolism, Purine, Pyrimidine Chemistry, And Metabolism; Vitamins, Minerals and Nutrition.

SCHEME FOR PAPER- I		**50 MARKS**
Section – I		
Q-1 Applied aspects of topics covered under paper-I course.	2 short notes out of three	2 X 5 = 10
Q-2 Enzymes Porphyrins, Carbohydrates andFat chemistry	3 short notes out of five	3 X 3 = 9
Q-3 pH, Homeostasis, bodyfluidscell, organfunction test, newer techniques.	2 short notes out of three	2 X 3 = 6
		25
Section – II		
Q-4 Fat and carbohydrate metabolism	2 short notes out of three	2 X 5 = 10
Q-5 Body defense mechanism, Biological oxidation, environmental Bio-chemistry, Cancer Bio-chemistry	3 short notes out of five	3 X 3 = 9
Q-6 Interpretative clinical chemistry with case report OR short explanatory objective questions	6 out of eight	6 X 1 = 6
		25
SCHEME FOR PAPER-2		50 MARKS
Section-I		
Q-1 Applied aspects of topics covered under paper-II course	2 short notes out of three	2 X 5 -10
Q-2 Nucleic acids, Chemistry and metabolism, molecular Biology	3 Short notes out of five	3 X 3 - 9
Q-3 Integration of metabolism and Nutrition	2 Short notes out of three	2 X 3 = 6
		25
Section-II		
Q-4 Protein metabolism, minerals and Protein chemistry	2 Short notes out of three	2 X 5 = 10
Q-5 Vitamins, Purine, Pyrimidine, chemistry and metabolism	3 Short notes out of five	3 X 3 = 9
Q-6 Interpretive chemistry with case report OR short explanatory objective questions	6 out of eight	6 X 1 = 6
		25

Biochemistry Marks Calculation

Theory			**Practical**	
		Marks		Marks
Final University Exam	Paper -1	50	Final University Exam	40
	Paper – 2	50		
Internal		20		
Oral Viva	Paper 1 Topics (10 marks)	20	Internal	20
	Paper 2 Topics (10 marks)			
Total Theory Marks		140	Total Practical Marks	60
Grand Total (Theory + Practical) Marks – **200**				

BIOCHEMISTRY PRACTICAL EXAMINATION SCHEME

	Duration	**Marks**		**Topics**
Practical No.1	1 Hour	20		Quantitative of Urea, Creatinine, Sugar, Cholesterol Bilirubin total proteins, alanine, transaminase, alkaline phosphatase, amylase, iron, electrolytes etc.
Practical No.2	1 Hour	20	14	Quantitative test of Carbohydrates, proteins, reactions of milk, egg White, composition of gastric juice, saliva, C.S.F, normal urine, estimation of free and total acidity in gastric juice, Titrable acidity and ammonia in urine, Abnormal urine
			6	Interpretation of biochemical finding of patient(case report). Or selected tests

Duration of MBBS Course for the Batch 2019-20

			Subjects	Duration	Date:
1	First MBBS		1) HumanAnatomy 2) HumanPhysiology 3) Biochemistry	1 Year	1/08/2019 to 31/07/2019
2	Second MBBS		1) Pathology 2) Microbiology 3) Pharmacology 4) ForensicMedicine	1½ Years	1/08/2020 to 31/01/2022
3	Third MBBS	Part I	1) Ophthalmology 2) Oto-Rhino-Laryngology (ENT) 3) CommunityMedicine	1 Year	1/02/2022 to 31/01/2023
		Part II	1) Medicine 2) GeneralSurgery 3) Obstretrics&Gynecology 4) Paediatrics	1 Year	1/02/2023 to 31/01/2024
			Total	4½ Years	
4	Internship			1 Year	February -March 2024 to February -March 2025