Chapter III
Post Graduate Courses in Anesthesiology
M. D. Anesthesiology

Goals:

The goals of three year degree course in Anaesthesiology would be to train a MBBS doctor who after the satisfactory completion of which shall:

1. Practice independently the art and science of Anaesthesiology and Resuscitation effectively and ethically, backed by scientific knowledge and skill base.
2. Undertake responsibilities in critical care unit, trauma unit, and respiratory therapy unit of unconscious patients requiring ventilatory support.
3. Undertake acute and chronic pain management.
4. Continue to evince keen interest in continuous professional development irrespective of whether he is in a teaching institution or in private anaesthetic practice.
5. Be a dedicated, motivated teacher who is always keen to train or to share his knowledge and skills with a colleague or junior or any learner.

Objectives:

The following objectives are laid out to achieve the goals of the course. These objectives have to be achieved by the candidates by the time of completion of the course. The objectives may be considered under the following headings.

1. Knowledge (Cognitive domain)
2. Skills (Psychomotor domain)
3. Attitudes communication skills, human values and ethical practice.

At the end of the training the candidate must be able to:

Knowledge:

- Demonstrate understanding of basic sciences relevant to Anaesthesia.
- Describe the Anaesthetic Management of common and uncommon surgical ailments belonging to various branches of surgery, at all ages requiring operative interventions with a basic knowledge of the aetiology, pathophysiology and the surgical treatment of the conditions.
- Describe the underlying theoretical background of mechanism pain perception and pain management.
- Describe the theory of the underlying aetiology, mechanism and management of the conditions requiring resuscitation.
- Demonstrate understanding of the theoretical base of polytrauma and the science of resuscitation.
- Recognise the conditions that may be outside the area of his competence and refer them to an appropriate specialist prior to anaesthetising them.

- Advise regarding the anaesthetic management of any surgical case and to carry out this management effectively.
- Update himself / herself by self-study and by attending courses, conferences and seminars relevant to anaesthesia.
- Teach and guide his team colleagues and students.
- Demonstrate understanding of medicolegal aspects of anaesthesia.
- Demonstrate basic knowledge of the administrative aspects operating rooms complex.
- Undertake audit, use information technology tools and carryout research, both basic and clinical, with the aim of publishing the work and presenting the same at various scientific fora.

Skills:

- Perform 'Pre-Anaesthetic Evaluation' of patients undergoing surgery by taking, proper clinical history, examining the patient, ordering relevant investigations and interpreting them to have additional information about the surgical condition, and or the associated medical condition, which warrant the modification of the proposed anaesthetic management.
- Administer anaesthesia (general and or regional) to common surgical operations independently and to superspecialisations like cardiac surgery, neurosurgery etc. with the help of a senior anaesthesiologist.
- Provider Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS).
- Manage airway and perform ventilatory care etc., of unconscious and polytrauma cases as a member of trauma team and critical care unit team.
- Undertake complete patient monitoring including preoperative, intra-operative and postoperative ventilatory care of the patients.
- Perform acute and chronic pain management.

Attitudes and Communication Abilities:

- Adopt ethical principles in all aspects of his anaesthetic practice. Professional honesty and integrity are to be fostered. Anaesthesia care is to be delivered to all in need, irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain the various options available in the anaesthetic management, critical care, pain management and to obtain a true informed consent from the patient.
- Provide leadership in the operating room environment and get best out of the team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.

- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

Course Contents:

It includes topics not only of Anaesthesiology but also those aspects of all the other branches of medicine relevant to Anaesthesia viz., Medicine and its allied subjects, Surgery and its allied branches, Pediatrics, applied Anatomy, Physiology, Pathology, Pharmacology, Microbiology etc. It is intended as a guide to the candidates and it is not comprehensive. As and when there is newer development, it becomes eligible for inclusion. Hence, the candidates should be familiar themselves with the current content of the scientific journals and reviews of major topics, in Anaesthesia.

1. History of Anaesthesiology.
2. Basic Sciences related to Anaesthesia including Anatomy, Physiology, Pharmacology, Biochemistry, Patho physiology, Immunology and Genetics.
3. Medicine applied to Anaesthesiology.
4. Physics related to Anaesthesiology, Electronics, Computers and Lasers, in Anaesthesiology. Internet/Medline and its uses and applications
5. Anaesthesiology.
   i. Pre anaesthetic evaluation and preparation.
   ii. Principles and Practice of Anaesthesiology including pre, per and post operative care, of patients belonging to General Surgery and other subspecialities like Cardiothoracic Surgery, Neurosurgery, Orthopaedics, Plastic Surgery and Surgical Endocrinology, Surgical Oncology, Paediatric, Obstetrics and Gynaecology, ENT, Ophthalmology, Urology, Dental Surgery, Laprocopy Surgery etc.
   iii. Blood transfusion-Fluid and Electrolyte balance, - Acid Base Balance.
   iv. Fires and Explosion in operation theatre.
   v. Operation Theatre sterilization procedures.
6. Pain Clinic organisation and management. Pain pathway, and management of pain.
7. Respiratory Therapy and management of both acute and chronic respiratory insufficiencies and ventilator commitments in I.C.U.
8. Critical Care Anaesthesiology and Trauma Care unit management.
   - Different methods of anaesthetic Techniques.
   - Regional anaesthesia including spinal, epidural and caudal etc.
   - Local Anaesthesia including nerve blocks.
   - Anaesthesia in abnormal environments like high attitude anaesthesia etc.
   - Complication in Anaesthesiology and their management both per and post operatively.
   - Anaesthesia for day care surgery.
   - Anaesthesia for diagnostic procedure like endoscopy C.T. Scan M.R.I. etc.
9. Informed consent/medicolegal issues: understanding the implications of acts of omission and commission in practice. Issues regarding consumer protection.

Implications in medicolegal cases.

10. Communication skills with colleagues teachers, patient's, and patients relatives.
11. Principles of Anaesthesia audit understanding the audit process and outcome; methods adopted for the same.
12. Essentials of Research methodology:
    i. Basics of Biostatistics and its application.
    ii. Ability to undertake clinical and basic research.
    iii. Ability to publish results of one's work.
13. Principles of Evidence Based Medicine and its application in anaesthetic practice.
14. Medical Ethics/social responsibilities of the anaesthesiologists.
15. Record keeping: Ability to keep records as scientifically as possible; knowledge of computers is beneficial.

TECHNICAL SKILLS TO BE ACQUIRED:

The list within the tables indicates the procedures that the student should by the end of the course, be able to perform independently (PI) by himself / herself, should have performed with assistance (PA) should have observed (O) or assisted (A) during the course. NA - Not Applicable

Skills may be considered under the following headings:

1. Basic Graduate Skills.
2. Anaesthesia Procedures.
3. Critical Care Procedures.
4. Emergency Room Procedures.
5. Pain Alleviation Procedures.

a) Basic Graduate Skills:

The student should have acquired the certain skills during his undergraduation and internship. There skills have to be reinforced at the beginning of the training period. There include;

Procedure	Category	Year	No.
Insertion of I.V. lines	PI	I	100
Insertion of Nasogastric Tubes	PI	I	100
Recording of Vital Signs.	PI	I	100

b) Anaesthesia Procedures:			
Orotracheal intubation	PI	I/II/III	100
Nasotracheal Intubation	PI	I/II/III	50
LMA insertion	PI	I/II/III	50
Airway (Oral/Nasal) Insertion	PI	I/II/III	100
Subarachnoid block	PI	I/II/III	100
Epidural block (including caudal)	PI	I/II/III	10
Brachial Plexus block	PI	II/III	5
Intravenous Regional Analgesia	PI	II/III	5
Three in One block	PI	II/III	2
Rectus Sheath Block	PI	II/III	2
Hernia Block	PI	II/III	2
Other nerve blocks	PI	II/III	NA
Major Anaesthesia Procedures	PA/PI	II/III (Per year)	100
Minor Anaesthesia Procedures	PA/PI	II/III (Per year)	200
c) Critical Care Procedures:			
Insertion of Arteriallines	PI	II/III	5
Insertion of Central Venous Lines	PI	II/III	5
Intercostal Drainage	O	II/III	NA
Tracheostomy	O	III	NA
Ventilatory Management of Patients	PI	II/III	NA
Sampling for & Interpretation of ABG	PI	II/III	NA
Correction of Electrolyte imbalance	PI	II/III	NA
Fiberoptic Bronchoscopy	PA	III	NA
Minitriacheostomy	PA	III	NA
Insertion of S.W.G. Catheter	O	III	NA

d) Emergency Room Procedures:			
Cardiopulmonary Resuscitation (BLS & ACLS)	PI	I/II/III	NA
Management of Cardiac failure	PI	II/III	2
Management of Respiratory Failure	PI	II/III	2
Management of Shock	PI	II/III	2
Management of Airway Obstruction	PI	I/II/III	5
e) Pain Alleviation Procedures:			
Stellate ganglion block	PA	III	2
Coeliae ganglion block	PA	III	2
Trigeminal Nerve block	PA	III	2
Labour analgesia	PI	II/III	
Post Operative Pain Management	PI	II/III	10
Neurolysis, & Other nerveablation procedures	PA	III	2
TENS	PI	II/III	2

Teaching and Learning Activities

A candidate pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance.

Every student shall attend teaching and learning activities during each year as prescribed by the department and not absent himself/herself from work without valid reasons.

A list of teaching and learning activities designed to facilitate students acquire essential knowledge and skills outlined is given below.

1. **Lectures:** Lectures are to be kept to a minimum. They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.
   a) Didactic Lectures: Recommended for selected common topics for postgraduate students of all specialities. Few topics are suggested as examples:
      1) Bio-statistics.
      2) Use of library
      3) Research Methods

4) Medical code of Conduct and Medical Ethics.
5) National health and Disease Control Programs.
6) Communication Skills etc.
7) Initial introductory lectures about the subject.

These topics may preferably taken up in the first few weeks of the 1st year.

b) Integrated Lectures: These are recommended to be taken by multidisciplinary teams for selected topics, e.g. Jaundice, Diabetes Mellitus, Thyroid etc.

2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must make a presentation from the allotted journal(s) of selected articles at least four times a year and a total of 12 presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A time table with names of the students and the moderator should be announced at the beginning of every year.

3. **Subject seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the logbook relevant details. Further, every candidate must present on selected topics at least four times a year and a total of 12 seminar presentations in three years. The presentations would be evaluated using checklists and would carry weightage for internal assessment (See Checklist in Chapter IV). A timetable for the subject with names of the student and the moderator should be scheduled at the beginning of every year.

4. **Student Symposium:** Recommended as an optional multi disciplinary programme. The evaluation may be similar to that described for subject seminar.

5. **Ward Rounds:** May be service rounds or teaching rounds.
   a) Service Rounds: Postgraduate students should do ward rounds every day.
      i) For pre anaesthetic evaluation of the patients posted for operation.
      ii) And to do the post anaesthetic follow up of operated patients for alleviation of post-operative pain and for diagnosis and management if any of the post-operative sequelae.
   b) Teaching Rounds: Every unit should have grand round for teaching clinical methods and pre anaesthetic evaluation.
   Entries of (a) and (b) should be made in the Logbook.

6. **Mortality & Morbidity Meetings:** Recommended once a month for all postgraduate students. Presentation be done by rotation and by the students who had conducted/assisted anaesthetic management.

7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of surgery & medicine at least once a month. These meetings should be attended by postgraduate students and relevant entries must be made in the Logbook.

8. **Teaching skills:** Postgraduate students must teach Undergraduate students (e.g. Medical, Nursing) by taking demonstrations, bed side clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty. Record of their participation should be kept in Logbook. Training of postgraduate students in Educational Technology is recommended.

9. **Continuing Medical Education Programmes (CME):** At least 2 state / national level CME programmes should be attended by each student in 3 years.

10. **Conferences:** Attending conferences is optional. However participation & presentation of scientific paper should be encouraged.

Dissertation:

Every candidate pursuing MD degree course in Anaesthesiology is required to carry out work on a selected research project under the guidance of recognised postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

1. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.

2. Every candidate shall submit to University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course on or before the dates notified by the University. The synopsis shall be sent through the proper channel.

3. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No changes in the dissertation topic or guide shall be made without prior approval of the University.

4. The dissertation should be written under the following headings:
   i. Introduction

ii. Aims or Objectives of study
iii. Review of Literature
iv. Material and Methods
v. Results
vi. Discussion
vii. Conclusion
viii. Summary
ix. References
x. Tables
xi. Annexure

5. The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other Checklists. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

6. Four copies of dissertation thus prepared shall be submitted to the University, six months before final examination on or before the dates notified by the University.

7. The dissertation shall be valued by examiners appointed by the University. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

8. **Guide:** The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work shall be as per Medical Council of India Minimum Qualifications for Teachers in Medical Institutions regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining postgraduate degree, shall be recognised as postgraduate teachers.
A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognised for teaching/training by the University / Medical Council of India. The co-guide shall be a recognised postgraduate teacher.

9. **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the university.
10. For some more details regarding Guide etc., please see Chapter I and for books on research methodology, ethics, etc., see Chapter IV.

Rotation and Posting in other Departments

The listed knowledge and skills are to be learnt over a period of 3 years. The process is a continuous one. However the recommended period and timing of training in basic sciences, allied departments and speciality departments are given below. The total duration of postings in allied and subspecialities will be 8 months and the remaining 2 years and 4 months in the mother department.

Basic Sciences: Rotation in these departments viz., Anatomy, Physiology, Pharmacology etc. are to done as concurrent studies during the 1st year of training. At least two hours may be spent in the first six months of the course. Basic Science relevant to Anaesthesia can be studied in the respective departments in the afternoons.

Anatomy: Special emphasis for the dissection of larynx, trachea, heart, various nerves & plexuses.

Physiology: Thorough revision of all the systems, in particular Cardio Vascular System and Respiratory System.

Pharmacology: of Drugs used in Anaesthesia and drugs used for management of systemic disease & Drug interactions.

Allied Speciality: Students should be posted ICU, ICCU, SICU (Trauma unit) and pain clinic during 2nd year of Training for 2 weeks in each, for total duration of 2 months.

Other Subspecialities of Anaesthesia:

Posting to other subspeciality departments will be during 2nd year and the duration of postings are as under;

Cardiothoracic Surgery	--	4 weeks
Neuro Surgery	--	4 weeks
Paediatric Surgery	--	4 weeks
Cancer Surgery	--	2 weeks
Oromaxillary Surgery	--	2 weeks
Plastic Surgery	--	2 weeks
Urology	--	2 weeks
Laproscopic and Endoscopic Surgery	--	2 weeks
Anaesthesia for investigative Procedure like CT Scan, Lithotripsy, Cardiac Cath Lab	--	2 weeks
		24 weeks

Yearwise Structured Training Schedule

First Year :

1. Basic Sciences related to Anaesthesiology: Theoretical knowledge, Frequent visits to Anatomy dissection halls & Museum, Physiology Laboratories etc., to revise the relevant subjects.
2. Theoretical knowledge of Anaesthesiology & Resuscitation: Special emphasis on clinical examination of patients, learning clinical methods, arriving at correct diagnosis.
3. Basic knowledge about
   Computers in Anaesthesia, Medline, Internet.
   Bio Statistics.
   Medical Audit.
   Medicolegal Aspects.
   Research Methodology.
   Evidence Based Medicine.
   Medical Ethics, & Social responsibilities of Anaesthesiologists.
4. Learning of communication skills.
5. Anaesthesia Skills
   - Pre Anaesthetic evaluation / under supervision.
   - Monitoring of patients through out perioperative period.
   - Assisting setting up of Anaesthesia Machine, Monitor & Ventilator.
   - Assisting the conduct of Anaesthesia for major surgeries; knowledge about the complications of Anaesthesia.
   - Assisting for short anaesthesia initially and later on doing independently under supervision
   - Conduct of Anaesthesia OPD.
   - CPR training and mastering of BLS & ACLS.
6. **Dissertation:** Choosing a topic of dissertation, submission of synopsis to the university, collection of literature, conduct of pilot studies.

Second Year:

1. Theoretical knowledge of allied subjects, subspecialities of Anaesthesia. Assisting senior anaesthesiologists in specialised branches like paediatric surgery, cardiothoracic surgery, critical care trauma etc.
2. Anaesthetic Skills: At the end of 2nd year the student should be capable of;
   a) Anaesthetising patients without assistance but under supervision.
   b) Identifying the complication of anaesthesia and manage them independently but under supervision.
   c) Setting up of Anaesthesia Machine, monitor and ventilator independently.
3. Conference & Workshops: Attending one state level and one national level conference/CME and presentation of a scientific paper.

4. Dissertation: Carrying out of the dissertation study work, periodic reviews, interaction with guide. Organisation of the data writing up of the manuscript of dissertation at end of 2nd year.
5. The student should be actively involved in presentation of seminars, journal clubs, case presentation/discussions.

Third Year:

1. The student should be well versed with basics, allied subjects and recent advances in the respective fields.
2. Anaesthesia Skills: At the end of the 3rd year the candidate should be able to make independent decisions as regards anaesthesia, pain management and post operative care of all kinds of patients.
3. Teaching Activities: Final year student should take lead in conducting seminars, journal clubs, case discussions, panel discussions with I & II year students. The third year students should also involve in teaching undergraduate students specially bedside clinics.
4. Dissertation: The completed dissertation must be submitted to the University, 6 months before the examination before the notified date.
5. The student must get expertise in the specialised procedures as noted in the course content table.

Monitoring Progress of Studies

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only also helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Chapter IV.

The learning out comes to be assessed should included: (i) Personal Attitudes, (ii) Acquisition of Knowledge, (iii) Clinical and operative skills, (iv) Teaching skills and (v) Dissertation.

i) ***Personal Attitudes.*** The essential items are:

- Caring attitudes
- Initiative
- Organisational ability
- Potential to cope with stressful situations and undertake responsibility
- Trust worthiness and reliability
- To understand and communicate intelligibly with patients and others
- To behave in a manner which establishes professional relationships with patients and colleagues

- Ability to work in team
- A critical enquiring approach to the acquisition of knowledge

The methods used mainly consist of observation. It is appreciated that these items require a degree of subjective assessment by the guide, supervisors and peers.

ii) . ***Acquisition of Knowledge*** : The methods used comprise of `Log Book' which records participation in various teaching / learning activities by the students. The number of activities attended and the number in which presentations are made are to be recorded. The log book should periodically be validated by the supervisors. Some of the activities are listed. The list is not complete. Institutions may include additional activities, if so, desired.

Journal Review Meeting (Journal Club): The ability to do literature search, in depth study, presentation skills, and use of audio- visual aids are to be assessed. The assessment is made by faculty members and peers attending the meeting using a checklist (see Model Checklist – I, Chapter IV)

Seminars / Symposia: The topics should be assigned to the student well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skills and use of audio- visual aids are to be assessed using a checklist (see Model Checklist-II, Chapter IV)

Clinico-pathological conferences : This should be a multidisciplinary case study of an interesting case to train the candidate to solve diagnostic and therapeutic problems by using an analytical approach. The presenter(s) are to be assessed using a check list similar to that used for seminar.

iii) ***Clinical skills***

Day to Day work : Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidates' sincerity and punctuality, analytical ability and communication skills (see Model Checklist III, Chapter IV).

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list (see Model checklist IV, Chapter IV).

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation. Particulars are recorded by the student in the log book. (Table No.3, Chapter IV)

(iv) ***Teaching skills :*** Candidates should be encouraged to teach undergraduate medical students and paramedical students, if any. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students (See Model checklist V, Chapter IV)

(v) ***Dissertation in the Department :*** Periodic presentations are to be made in the department. Initially the topic selected is to be presented before submission to the University for registration, again before finalisation for critical evaluation and another before final submission of the completed work (See Model Checklist VI & VII, Chapter IV)

(vi) *Work diary / Log Book* - Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

(vii) *Periodic tests:* The departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

(viii) *Records:* Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or MCI.

Log book

The log book is a record of the important activities of the candidates during his training, Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

Format for the log book for the different activities is given in Tables 1,2 and 3 of Chapter IV, Copies may be made and used by the institutions.

Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counselled by the guide and head of the department. In extreme cases of default the departmental committee may recommend

that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

Scheme of Examination

A) Theory:

Written examination shall consist of four question papers each of three hours duration. Each paper shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:

Paper I : Basic Science as applicable to Anaesthesia.

1. Anatomy.
2. Physiology.
3. Pharmacology.
4. Physics.
5. Biochemistry.
6. Patho Physiology.
7. History
8. Equipments.

Paper II : Clinical Practice of Anaesthesia.

1. Cardio Vascular System.
2. Respiratory System.
3. Neuro Surgery.
4. Obstetrics & Gyanecology
5. Orthopaedics.
6. Ophthalmology.

Paper III: Clinical Practice of Anaesthesia.

1. Paediatrics.
2. Renal & Hepatic system.
3. Enorcrines.
4. Haemopoitics.
5. Geriatrics
6. E.N.T.
7. Out Patient Anesthesia & Dental Anaesthesia.
8. Nerve Blocks.

Paper IV Applied Medicine in Relation to Anaesthesia.
Theoretical Aspects of pain and pain relief including postoperative & Cancer Pain.

Note: The distribution of chapters / topics shown against the papers are suggestive only.

B) Clinical Examination: **200 marks**

It should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidates should examine & present atleast one long case (carrying 100 marks) and two short cases (each carrying 50 marks). The total marks for clinical examination shall be 200.

C) Viva-Voce: **100 marks**

Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under;

i. For examination of all components of syllabus ..... 80 marks
All examiners will conduct viva-voce conjointly on candidates comprehension, analytical approach expression and interpretation of data. It includes all components of course contents. In addition the candidate may also be given, instruments/equipments, X-ray images, ABG reports, ECG strips, Drugs Ultrasound/Echocardiography reports & specimen. It includes discussion on dissertation also.

ii. For teaching skills (Pedagogy) ..... 20 marks
A topic to be given to each candidate in the beginning of clinical examination. He / She is asked to make presentation on the topic for 8 to 10 minutes.

Maximum marks for	Theory	Practical	Viva	Grand Total
M.D. Anaesthesiology	400	200	100	700

Recommended Books and Journals

Books:

1. Practice of Anesthesiology - Wylie - Churchill - Davidson.
2. General Anesthesia - Gray, Nunn, Utting.
3. Anaesthesia - Two volumes, Ronald D, Miller.
4. Anatomy for Anaesthesist - Harold Willis
5. Understanding Anesthetist Equipments - Dorsh & Dorsh.
6. Emergency Anaesthesia - Thronton
7. Principles of Obstetric - Anesthesia - J. S. Crawford.
8. Physics for Anesthetist - Muscnin & Mactintosh.
9. Neuro Surgical Anaesthesia - Hunter
10. Paediatric Anaesthesia - Gregory.
11. Cardiac Anaesthesiology - 2 volumes - Jonathan Benumfit.
12. Anaesthesia and co existing diseases - Stoclting.

13. Anaesthesia Equipment - Ehrenwerth and James. B. Eiscnkraft
14. Text Book of Anaesthesia - A. R. Aitken Head & G. Smith
15. Anaesthesia for infants and children - Smith
16. Obstetrics Anaesthesia and Andgest - Bonica
17. Regional Anaesthesia - Mahentosh series
18. Epideral Analgesia - Broomage
19. Medical problems of Anaesthesia - Kaulman
20. Principles of Anaesthesiology - Collins
21. Anaesthesia for Orthopedic Surgery - Zauder & other
22. Neural Blockade - Cousins
23. Cardiac Anaesthesia - Kaplar
24. Thoracic Anacsthesia - Kaplan and Muschin
25. Regional Anaesthesia - Labot
26. Drugs Interactions & other basic Medical science and Anaesthesia speciality books as available.

Journals

1. Anaesthesiology and Analgesia Journal (States)
2. Anaesthesiology Journal
3. Anaesthesia Journal
4. Acta Anaesthesia Scandinavia
5. Canadian Journal of Anaesthesia
6. Indian Journal of Anaesthesia
7. British Journal of Anaesthesia
8. Expert Anaesthesia
9. Recent advances in Anaesthesiology
10. Year Book of Anaesthesia
11. Anaesthesia Clinics
12. Clinics in North America in Anaesthesiology

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANAESTHESIOLOGY

BASIC SCIENCE in relation to ANAESTHESIA

PAPER – I

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Describe with diagram the normal oxyhaemoglobin dissociation curve. Explain the factors affecting oxyhaemoglobin dissociation curve and its clinical significance

2. Define hypoxic pulmonary vasoconstriction and explain its physiological significance. Discuss the factors and therapeutic intervention that alter hypoxic pulmonary vasoconstriction and explain pulmonary vasoconstriction in one lung anaesthesia

SHORT ESSAY **6 X 10 = 60 Marks**

3. Dibucaine number
4. Horace Wells
5. Univent tube
6. Blood gas solubility coefficient
7. Surfactant
8. Second gas affect

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANAESTHESIOLOGY

CLINICAL PRACTICE OF ANAESTHESIA

PAPER – II

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. A 45 year old male with bronchiectasis of left lower lobe is scheduled for left lower lobotomy in the lateral position. Mention your technique of lung isolation. Discuss the technical detail of the clinical conduct of one lung ventilation including monitoring and optimization of gas exchange

2. A 40 year lady with dysfunctional uterine bleeding scheduled for abdominal hysterectomy gives history of breathlessness on minimal exertion. Her preoperative hemoglobin concentration of 5.5g/dl. Discuss the preoperative assessment, preparation anaesthetic management and post operative care

SHORT ESSAY **6 X 10 = 60 Marks**

3. Myocardial preservation during open heart surgery

4. Oculocardiac reflex

5. Awareness during anaesthesia

6. Intraoperative bronchospasm

7. Methods used for reducing intracranial pressure

8. Diagnosis and treatment of fat embolism

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANAESTHESIOLOGY

CLINICAL PRACTICE OF ANAESTHESIA

PAPER – III

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Discuss the preanaesthetic evaluation and anesthetic problems in a patient with chronic renal failure
2. Describe the anesthetic implications of severe anemia

SHORT ESSAY **6 X 10 = 60 Marks**

3. Liver function tests
4. Anesthetic implications in hypothyroidism
5. Coeliac plexus block
6. Postoperative oliguria
7. Hypocalcaemia
8. Anaesthetic problems in sickle cell disease

* * * * *

SRI SIDDHARTHA UNIVERSITY

M.D. Degree Examination – Model Question Paper

[Time: 3 Hours] [Max. Marks: 100]

ANAESTHESIOLOGY

PAPER – IV

Q.P. CODE :

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary. Answer all questions

LONG ESSAY **2 X 20 = 40 Marks**

1. Describe various positions for Anaesthesia and Surgery with a special mention about Obese patients and positioning.
2. Describe in detail about Hypotensive Anaesthesia.

SHORT ESSAY **6 X 10 = 60 Marks**

3. ESMOLOL.
4. Perflurocarbons.
5. Eutectic Mixture of Local Anaesthetics.
6. Endotracheal Suction in an adult on ICU Ventilator.
7. Fat Embolism.
8. Pharmacodynamics of SEVOFLURANE.

* * * * *