

# **ANATOMY** for **NEET PG** **Theory & MCQ's**

**Volume - 1**

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*Dedicated in fond memory of*  
**Padma Shri Prof. Dr. Mahdi Hasan**  
*(21 March 1936 –12 January 2013)*

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**1. Early Life and education:**

Professor Mahdi Hasan (born in Gadayan village, Akbarpur, then in Faizabad, now Ambedkar Nagar, Uttar Pradesh) was formerly Principal and Chief Medical Superintendent (1983– 87), Dean (1991–93) and Head of the Department of Anatomy, Jawaharlal Nehru Medical College, Aligarh. He was an internationally renowned anatomist, a pioneering brain researcher and a reputed national expert of medical education.

Prof. Hasan had many firsts to his credit: he was the first in India to have obtained an MS with honours in anatomy; the first anatomist to be selected by the Government of India for the German Academic Exchange Fellowship (DAAD) in 1965; the only Indian anatomist to be chosen Fellow of Alexander von-Humboldt Foundation (Germany); the first Indian anatomist to be elected Fellow of the Indian National Science Academy (FNA) and to be awarded the Padma Shri.

Professor Hasan's initial education was in Akbarpur (Faizabad). Thereafter he did his Intermediate from Christian College, Lucknow and BSc I year from Lucknow University. In 1953, he was selected for MBBS at King George's Medical College (KGMC), Lucknow. He later on obtained his post-graduation in anatomy from the same institution and obtained Ph.D. and D.Sc. from the Aligarh Muslim University, Aligarh.

**2. Academic and Research Career**

Prof. Hasan joined the anatomy department, KGMC, Lucknow, as a demonstrator in 1958 and after briefly working as a lecturer, in 1963 he moved to Aligarh as a Reader in Anatomy. Continuing his pursuit of knowledge, he went to Germany in 1965. He not only learnt electron microscopy and worked on ageing with the renowned Professor (Dr) Paul Glee at the University of Gottingen, but also got an opportunity to learn German. Although in 1972 he was offered the

citizenship of Germany, he politely declined and came back to India and established India's first Interdisciplinary Brain Research Centre (IBRC) at Aligarh in 1977.

Prof. Hasan's persistent endeavour was to pursue basic medical research, often linked with clinical applications. The main thrust was to study problems of national relevance, such as environmental pollution, pesticide and metal neurotoxicity, hydrocephalus and brain ageing. His research group proposed a new hypothesis for the genesis of lipofuscin (age-pigment) in 1972. He also discovered a new technique for demonstrating zinc in brain sections. His more than 150 original research papers, in reputed indexed journals, have received over 2500 citations in journals of international repute and books, including Gray's Anatomy. He has also published 6 books (one only in the month of December 2012, in spite of being terminally ill) and contributed chapters in 8 books. His commitment and dedication to acquire and disseminate knowledge can also be judged from the fact that during the last 6 months of his life, when he was very seriously ill, he worked earnestly to complete a book on Treacher Collins Syndrome. Fortunately, the book was published a few days before his death when he was in the intensive care unit.

Dr Hasan, all through his illustrious academic career spanning around 55 years (1958–2013), fought a relentless battle and succeeded in giving a completely new orientation to the teaching of anatomy. Thousands of his former students, practicing modern medicine around the globe, not only adored him but also respected his genius. Hundreds of them are professors/consultants in various specialties of medicine and surgery in India and abroad. His passion for teaching did not dip even after retirement. He continued to teach and do research and write for grants. He could take classes anywhere—even in corridors. Once at Aligarh Muslim University, a student asked him for time to seek some clarifications. Then and there on the street, using a bicycle seat as support for pen and paper, he spent over two hours explaining the matter to the student under street light.

### **3. Recognition**

Prof. Hasan's academic qualifications' included MBBS, MS (with Honours in Anatomy, the first in India), Ph.D., D.Sc., F.A.M.S., F.I.C.S., FRMS, FNASc. and FNA. He was fellow of 4 International Academies, has been advisor to WHO (1983-85) and served as Visiting Professor to a number of Universities, including University of Goettingen (Germany) 1972, Benghazi, Libya (1983-86), Tehran 1993-94, Nanchang, China (June-July, 2005). Also, he delivered scores of lectures at prestigious medical institutions abroad on special invitations (including Albert Einstein College, New York, NCTR Jefferson, Chicago, University of Hawaii, Universities of Mainz and Goettingen (Germany), Trieste, Naples, Florence (Italy), London and Kuwait). He was a member of the Expert Committee appointed by the Govt. of India to draft the National Educational Policy for Health Sciences (Bajaj Committee, 1988-90). In February 2010, he was appointed a member of NAAC (National Assessment and Accreditation Council of Govt. of India).

He was a recipient of the prestigious Dr B.C. Roy National Award in the category of "Eminent Medical Teacher" (1991), Hari Om Ashram Alembic Award of Medical Council of India (1979), Dr S.S. Misra Medal of National Academy of Medical Sciences (India), Dr Dharam Narayan Gold Medal of the Anatomical Society of India (1977), Ati Vishisht Chikitsa Medal of

College of Chest Physicians of India (1995), Sushruta Award of World Academy of Integrated Medicine (WAIM) 2002, Dr Bachawat Life-Time Achievement Award of Indian Academy of Neurosciences (2004), Dr. Tirumurti Award of Indian National Science Academy (2010) and Life Time Achievement Award of Anatomical Society of India (2013). He was President of three national bodies, Anatomical Society of India, Indian Academy of Neurosciences & Association of Gerontology of India.

Prof. Hasan's path breaking endeavours for the promotion of the brain research resulted in the establishment of India's first "Interdisciplinary Brain Research Centre" (IBRC) at Jawaharlal Nehru Medical College, AMU, Aligarh in 1977 and the birth of the Indian Academy of Neurosciences at Aligarh in 1983.

Seldom does one find a nucleus around which an institution is build, but it goes to the credit of Professor Mahdi Hasan that at least three premier medical institutions of North India will always fondly cherish his memory. KGMC will always remember him as its illustrious student and teacher; Jawaharlal Nehru Medical College, Aligarh will always remember him as an excellent dedicated and devoted teacher; and Era's Lucknow Medical College, Lucknow (a medical institution founded around him) will find it difficult to overlook its founder Director-Principal and Trustee.

#### **4. Passing Away**

He breathed his last at 6 p.m. on 12 January 2013 after fighting a relentless battle against cancer of the prostate. His wife, Mrs Abida Mahdi died soon after on 24 February 2013.



**Dr. Sanjeev Misra**  
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## FOREWORD


In my opinion education is to provide knowledge, skills and values to the learners and every education system has two important domains first-teaching/learning and preparation of subject, second domain is - evaluation of the knowledge by certain examinations. Nowadays latest and most scientific approach to evaluate the subjective knowledge in most of exams is by multiple choice questions, i.e. MCQs. More important to know is that MCQs are the only questions presently asked in the Medical PG Entrance Exams at state or national level and proposed NEET PG too. So preparations which is based on basic foundation of the subject and honed by practicing MCQ's regularly, journey for success becomes comfortable.

Keeping this in mind Dr Brijendra Singh has done a great effort by crafting a book having theory of the anatomy subject highlighting the key points and areas, chapter wise, and section wise followed by MCQ's at the end of each chapter. I hope his efforts will be instrumental for success of readers.

It gives me great pleasure that Dr. Singh has already prepared and published much needed books in anatomy, in four volumes, concise, handy and student friendly - '*Exam Success Review - Anatomy MCQ's for 1st Prof. MBBS & PG Entrance - by Dr. Brijendra Singh, in four volumes - Volume -1 Head, Neck & Brain, Volume -2 Thorax, Upper Limb & Volume -3 Abdomen & Lower Limb and Volume - 4. Embryology & Histology.* I hope that these books will certainly help the MBBS students to secure desired merit in their exams and will also be useful for their preparations for PG Entrance examinations and help them to get the PG of their choice.

I appreciate the efforts and hard work put in by Dr. Singh writing another couple of books in anatomy dedicated specifically for **Anatomy - Theory & MCQ'S for NEET & PG Entrance – Volume-1 & Volume -2 .**

I wish him as well as readers a great success ahead.

  
19.8.2016

**Dr. Sanjeev Misra**  
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FICS, FACS (USA), FAMS  
**Director & CEO AIIMS,**  
**Jodhpur, India**





# PREFACE

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First of all I am thankful to all of my students present and past who kept me reminding continuously about the need of small, simple, handy and really concise and complete book of anatomy subject as per their new syllabus and as per latest guidelines of **Medical Council of India and NEET PG**. Now-a-days the best exams are supposed to be those which are having Multiple Choice Questions ie MCQ's as integral part because of two important reasons, First easy to conduct and uniform evaluation for all students, that is no bias, Second **MCQ's** checks memory/recall memory/reasoning & ability to be precise in terms of reading/understanding and speed with ability to record answers with accuracy too. "**Anatomy for NEET PG - Theory & MCQ's**" is helpful as a complete syllabus for bulleted text and MCQ's for **fast revision during examination** and will certainly help them to secure full marks in **NEET PG Examinations**. One shall remember that **MCQ's are the only questions which are asked in PG Entrance Examinations**. Keeping all this in mind and realizing the need of this type of systematic and authentic book on subject as well as continuous demand from various groups of students, this complete book "**Anatomy for NEET PG - Theory & MCQ's**" is crafted for you all, to make your dreams of getting **PG of your choice** through **NEET PG Examinations**.

All the best for your future ventures.....

Good luck & Happy reading .....

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First of all my sincere thanks to **Prof. Sanjeev Misra CEO & Director of AIIMS, Jodhpur, India**, for his inspiration, unconditional support & continuous encouragement to create & complete my book "**Anatomy for NEET PG - Theory & MCQ's**". I am also thankful to my colleagues from department of Anatomy at AIIMS, Jodhpur for their suggestions and support for making this book better and student friendly.

I am also thankful to my childrens Vyomika Singh & Kostubh Singh for helping me in this book and wife Dr. Ritu Singh, for positive suggestions, ideas and continuous encouragement. I am thankful to my students past & present for appreciating my way of teaching - ABC of life that is - Aim, Basics & Competition and expecting more simpler & interesting way of Anatomy teaching from my side I am thankful to my friends & well wishers from All India Institute of Medical Sciences (AIIMS), Jodhpur, India

I am very much thankful to Mr. Tanay Sharma, Managing Director, Scientific Publishers (India), Jodhpur for timely workup editing and final printing.

I am and will remain indebted to almighty **God Lord Krishna** with folded hands for his blessings so that my book "**Anatomy for NEET PG - Theory & MCQ's**" could become a reality and will be useful for readers today, tomorrow & ever.

Thanks & All the best....

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# **Head, Neck Theory**

