

## Syllabus and Examination pattern for Post - Graduate Medical Courses

### NOTIFICATION

Ref. :

- (1) *Medical Council of India Regulation on Graduate Medical Education, 1997.*
- (2) *Amendment of the regulations on graduate medical education notified by Government of India from time to time :*
  - a. *Gazette Notification dated 29.05.1999.*
  - b. *Notification no. MCI-37 (2)/2001/Med-922, dated 12.04.2001.*
  - c. *Notification no. MCI-26 (3)/2003/Med-18503, dated 26.09.2003.*
  - d. *Notification no. MCI-26 (3)/2003/Med-20958, dated 15.10.2003.*

*In exercise of the powers, conferred under section 26 of Krishna Institute of Medical Sciences Deemed University, the Board of Management in its meeting held on 27<sup>th</sup> June, 2006, has been pleased to approve the Bye-law pertaining to Post Graduate Medical courses as given in schedule here to Annexed.*

*The Bye-law as above shall be effective for the students admitted to Post Graduate Medical courses from the academic year 2006-07 onwards.*

**By Order  
Registrar**

1. This byelaw shall be called Syllabus and Examination pattern for Post-Graduate Medical Course.

### **M.D. In Pathology**

**Goal:**

- The goal of postgraduate medical education shall be to produce competent specialist.
- a. Who shall recognize the health needs of the community and carry out professional obligation ethically and in keeping with the objectives of the national health policy.
  - b. Who shall have mastered most of the competencies, retaining to the speciality, that are required to be practiced at the secondary and tertiary levels of the health care delivery system.
  - c. Who shall be aware of contemporary advances and developments in the discipline concerned.
  - d. Who shall have acquired a spirit of scientific inquiry and oriented to the principles of research methodology and epidemiology; and
  - e. Who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

**Objectives:**

At the end of the course a candidate must be able to-

- a. Understand and explain about the factors in causation of disease.
- b. Understand processes involved in the gross and microscopic changes of organs and tissues and explain these changes.
- c. Understand and explain the basis of evolution of clinical signs and symptoms.
- d. Should be able to perform procedures designated for laboratory detection of diseases. Should be able to process and accurately interpret the representative materials obtained from the patients in order to arrive at a correct diagnosis.

- e. Should be able to recognize and report morphological changes in cells, tissues and organs.
- f. Should be able to plan, perform and report specific research projects.
- g. Should be able to perform clinical autopsy and present CPC (Clinico Pathological Correlation)

### Methods Of Training

Duration Of Course - 3 years.

#### 1. On job training

- a. Histopathology including techniques and reporting.
- b. Cytology including FNAC, fluid cytology, exfoliative cytology- techniques and reporting.
- c. Haematology including blood banking and transfusion medicine- techniques and reporting.
- d. Clinical pathology- techniques and reporting.
- e. Museum techniques.
- f. Autopsy techniques and interpretation.
- g. Serology- techniques and reporting.
- h. Handling of hazardous material.
- i. Handling, maintenance and calibration of instruments used in laboratory.
- j. Undergraduate teaching.

#### 2. P.G. Teaching sessions

- a. Journal review.
- b. Subject seminar.
- c. Grossing discussions for autopsies and surgical material.
- d. Slide seminar including histopathology ,haematology, and cytopathology.
- e. Clinical case- group discussion.
- f. Interdepartmental seminars.

Postgraduate students should be encouraged to attend CME, Workshops, Conferences & present papers.

### Teaching / Learning Content

#### A. Theory

##### I. Basic Sciences

Four lectures should be conducted for all the PGS in the beginning of the course. They will be -

- 1. Biostatistics - P & S.M.
- 2. Biomedical ethics-ethical issues related to Medical practice and research - Pharmacology.
- 3. Orientation to service departments by clinical and paraclinical doctor.
- 4. Biowaste disposal - Microbiology

##### II. Pathology

Historical aspects

- 1. General pathology.
- 2. Systemic pathology.
- 3. Haematology.
- 4. Blood banking and Transfusion Medicine.
- 5. Cytopathology.
- 6. Clinical Pathology.
- 7. Medical autopsy: Techniques and interpretation.

8. Recent advances in all fields, related to Pathology.
9. Organization of laboratory including quality control.

### III. Clinical Biochemistry

Routine biochemical investigations and various organ function tests i.e. LFT, RFT etc.

### B. Practical

Proficiency of technological methods should include the following:

1. Fields in which high degree of professional competence and theoretical knowledge is expected:
  - a. Gross pathology and histopathology.
  - b. Haematology.
  - c. Cytopathology.
  - d. Clinical pathology and Blood banking
2. Fields in which student is expected to achieve reasonable working knowledge and skills to be able to run laboratory services independently.
  - a. Clinical chemistry.
  - b. Serology
3. Fields in which student is expected to achieve general acquaintance of techniques to understand and interpret data.
  - a. Immunopathology.
  - b. Histochemistry.
  - c. Immunohistochemistry.
  - d. Cytogenetics.
  - e. Molecular biology.
  - f. Medical statistics.

### Posting Schedule

1. Histopathology and Autopsy including museum: -	6 x 2 = 12 months
2. Clinical pathology	
Haematology including blood bank 1 month: -	6 x 2 = 12 month
Cytopathology -	5 x 2 = 10 month
3. Biochemistry: -	15 days
4. Serology: -	15 days
5. Revision in all sections: -	1 month
<b>TOTAL</b>	<b>36 months</b>

### Recommended Minimum Text Books And Journals-

#### Books:

1. Cotran, Kumar, Collins. Robin's Pathologic Basis of Disease, published by W.B. Saunders & Company.
2. Ivan Damjanov, James Linder. Anderson's Pathology, published by C.V. Mosby Company.
3. J. B. Walter, M.S. Israel. General Pathology, published by Churchill Livingstone.
4. Emeritus W.ST. Symmers Systemic Pathology, published by Churchill Livingstone.
5. Juan Rosai, Ackerman's Surgical Pathology, published by C.V. Mosby Company.
6. Leopold G Koss, Diagnostic cytology and its histopathologic basis published by J.B. Lippincott Company.
7. Marluce Bibbo, Comprehensive cytopathology, published by W.B Saunders Company.
8. Winnifred Grey, Diagnostic cytopathology, published by Churchill Livingstone.
9. Orell, Sterrett- Walters and Whittaker, Fine Needle Aspiration Cytology (Manual & Atlas), published by Churchill Livingstone.

10. Greer J.P, Foerster J, Jukens J et. al Wintrobe's Clinical Haematology, published by Lippincott Williams and Wilkins.
11. Firkin F, Chesterman C, Penington D, de Gruchy's Clinical Haematology in Medical Practice, published by Blackwell Sciences.
12. Henry J.B Clinical Diagnostics and Management by Laboratory Methods. published by W.B. Saunders & Company.
13. Lewis S.M, Bain D.J, Bates I, Dacie & Lewis Practical Haematology published by Churchill Livingstone.
14. Hoffbrand A.V, Catovsky D, Tuddenham G.D, Postgraduate Haematology - published by Blackwell publishing.
15. R.Anantnarayan , C.K.Paniker, Textbook of Microbiology , published by Orient Longman.
16. Harshmohan, Textbook of pathology, published by Jaypee.
17. Parasitology (Protozoology & Helminthology.) in relation to clinical medicine - K.D.Chatterjee - published by Chatterjee Medical Publication.
18. Sudha R.Kini, Colour Atlas of differential diagnosis in exfoliative and aspiration cytopathology, published by Lippincott, Williams & Wilkins.
19. Praful B. Godkar, Clinical Biochemistry - Principles & practice, published by Bhalani Publishing House, Bombay.
20. Theory & practice of Histological Techniques edited by John. D.Bancroft- published by Churchill Livingstone.
21. Enzinger & Weiss, Soft Tissue Tumours, Published by B.I.Publications (India.) C.V. Mosby company.
22. Elder D.E, Lever's Histopathology of the skin - Published by J.B.Lippincott Company.
23. Novak & Woodruff Edited, Novak's Gynaecologic and Obsteric Pathology, published by - Kiaku Shoin/Saunders.
24. Christopher D.M. Fletcher, Diagnostic Histopathology of Tumours Vol.1 & 2- published by Churchill Livingstone.
25. Recent advances in Histopathology, Haematology, Blood coagulation etc.
26. AFIP, Atlas of tumour pathology.
27. Interpretation of Breast Biopsies - Carter.
28. Day D.W, Jass J.R, Price A.B, Morson and Dawson's Gastrointestinal Pathology, published by Blackwell publishing.
29. Ellison D, Love S, Chimelli L et. al, Neuropathology , published by Mosby.
30. Epstein Prostate Biopsy Interpretation, published by Lippincott- Raven.
31. Fogo A.B, Kashgarian M, Diagnostic Atlas of Renal Pathology, published by Elsevier Saunders.
32. Foster C.R, Pathology of the Urinary Bladder, published by Saunders.
33. Fox H, Wells M, Haines & Taylor - Obstetric and Gynaecological Pathology, published by Churchill Livingstone.
34. Joachim H.L, Lymphnode Pathology, published by Lippincott.
35. Kilpatrick, Renner, Diagnostic Musculoskeletal Surgical Pathology, Clinicoradiologic & cytologic correlations, published by Saunders.
36. Kurman R.J, Blaustein's pathology of the female genital tract, published by Springer.
37. Leslie K.O, Wick M.R, Practical pulmonary pathology; a Diagnostic approach, published by Churchill Livingstone.
38. MacSween, Butt, Portman et al, Pathology of the liver- published by Churchill Livingstone.

39. Mills S.E, Sternberg's diagnostic surgical pathology, published by Lippincott Williams and Wilkins.
40. Montgomery E.A, Biopsy interpretation of the Gastrointestinal Tract Mucosa, published by Lippincott Williams and Wilkins.
41. Odze R.D, Surgical pathology of the GI Tract, Liver, Biliary Tract and Pancreas, published by Saunders.
42. Owen D, Pathology of the Gall Bladder, Biliary Tract, and Pancreas, published by Saunders.
43. Pilch B.Z, Head and Neck surgical pathology, published by Lippincott Williams and Wilkins.
44. Rosen P, Pathology of Breast, published by Lippincott Williams and Wilkins.
45. Silverberg S.G, Atlas of Breast pathology, published by Saunders.
46. Weedon, Skin Pathology, published by Churchill Livingstone.
47. Wickremasinghe, Blood and Bone marrow pathology, published by Churchill Livingstone.
48. Atkinson B, Atlas of diagnostic pathology, published by Saunders.
49. Cibas E.S, Cytology: Diagnostic principles and clinical correlates, published by Saunders.
50. Geiinger, Modern cytopathology.
51. Naib Z.M, Cytopathology, published by Little Brown and company.
52. Meisels A, Morin C, Cytopathology of the uterine Cervix, published by ASCP Press.
53. Miettinen M, Diagnostic soft tissue pathology, published by Churchill Livingstone.
54. Chandler F.W, Pathologic diagnosis of fungal infection, published by ASCP Press.
55. Collins R.D, Paediatric Haematopathology, published by Churchill Livingstone.
56. Hoffman, Benz, Shattil, Haematology: Basic principles and practice, published by Churchill Livingstone.
57. Naeim F, Atlas of bone marrow and blood pathology, published by W. B Saunders.
58. Tkachuk D.C, Atlas of clinical haematology, published by Saunders.
59. WHO Classification of tumours, published by IARC Press.
60. Mollison P.L, Blood transfusion in clinical medicine, published by Oxford, ELBS & Blackwell Scientific Publication.
61. Chitale A, Pathology of urinary & male genital system for urologists, general surgeons & Pathologists published by B.I. Publications.
62. Saran R.K., Transfusion medicine technical manual, published by WHO.

**Journals:**

1. British Journal of Haematology, published by Blackwell Sciences.
2. CANCER, International journal of American Cancer Society, published by John Wile & Sons Inc.
3. Journal of Clinical Pathology, published by B.M.J.
4. Hematology / Oncology Clinics of North America, published by W.B. Saunders & Company.
5. American Journal of Surgical Pathology, published by Lippincott & Raven.
6. Indian Journal of Pathology & Microbiology, published by IAPM.
7. Indian Journal of Cancer, published by Indian Cancer Society.
8. Indian Journal of Cytology, published by IAC.
9. LANCET published by Elsevier.
10. I.C.M.R. Bulletin published by ICMR.
11. Histopathology, journal of the British Division of the International Academy of Pathology-Published by Blackwell Science.
12. Acta Cytologica, The Journal of Clinical Cytology and Cytopathology.

13. Archives of Pathology and Laboratory Medicine-Published by American Medical Association.
14. Human Pathology- Published by W.B. Saunders & Company.
15. American Journal of Clinical Pathology published by ASCP.
16. Indian Journal of Cytology.
17. WHO Bulletin published by WHO.
18. Indian Journal of Urology.
19. Modern Pathology.
20. Indian journal of Leprosy published by Indian Leprosy Association.
21. New England Journal of Medicine published by Massachusetts Medical Society.

#### **Additional Readings:**

1. Compendium of recommendations of various committees on health and development (1943 to 1975) DGHS, 1985 Central Bureau of Health Intelligence, DGHS, Ministry of Health & Family Welfare, Govt. of India, Nirman Bhavan, New Delhi-335.
2. National Health Policy, Ministry of Health & Family Welfare, Govt. of India, Nirman Bhavan, New Delhi-335. 1983.
3. ICMR, Policy, Statement of ethical considerations involved in research on Human subjects, 1982 ICMR, New Delhi.
4. Code of Medical Ethics framed under Section- 33 of Indian Medical Council Act, 1956. MCI, Kotla road, New Delhi.
5. Santosh Kumar, The elements of Research, writing and editing 1994, Dept. of Urology, JIPMER, Pondicherry.
6. Srinivas D.K et al, Medical Education Principles and Practices, 1995. National Teacher Training Centres, JIPMER, Pondicherry.
7. Francis C.M Medical Ethics, J.P.Publication, Bangalore 1993.
8. Indian National Science Academy, Guidelines for care and use of animals in scientific research, New Delhi, 1994.
9. International Committee of Medical Journal Editors, Uniform Requirements for manuscripts submitted to biomedical journal. N. Engl J Med 1991; 424-8
10. Kirkwood B.R. Essentials of Medical Statistics, 1st ed. Oxford Blackwell Scientific Publications 1988.
11. Mahajan B.K. Methods in Biostatistics for medical students, 5th ed New Delhi, Jaypee Brothers Medical Publishers, 1989.
12. Raveendran B. Gitanjali, A Practical Approach to PG dissertation, New Delhi. J.P Publications 1998.

#### **Evaluation System**

##### **A. Dissertation**

- a. Thesis / Dissertation is compulsory. Every candidate is required to carry out the work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such work shall be submitted in the form of a Dissertation.
- b. The Dissertation is aimed at training the candidate in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of relevant literature, getting acquaintance with recent advances, designing of research study, collection of data, critical analysis of results and drawing conclusions.

- c. The title of the topic along with the plan of work not exceeding 500 words in prescribed proforma should be submitted to the University with the recommendation of guide through proper channel within a period of 3 months from the date of registration for the postgraduate course. There should not be an overlap of topic, cases, material or the related data among the candidates within the department during the period of actual Dissertation work. Prior approval by the local Ethical Committee is essential. Unless communicated otherwise within a period of 2 months from the date of receipt of plan of work by University, it shall be assumed that topic of Dissertation is approved and no communication is necessary in this regard. The last date for submission will not be extended without prior permission from the University. In case of delay in submission of topic of Dissertation and plan of work, the period of training of the candidate will be proportionately extended for which the entire responsibility shall be upon the candidate.
- d. The volume of the Dissertation should be reasonable and may vary depending on the topic. The bibliography should be as per Vancouver system.
- e. Four copies of the Dissertation complete in all respect certified by the guide should be submitted to the University through proper channel 6 months before the final examinations to the registrar (evaluation).
- f. The identity of the candidate/ teacher/ Department /College / Place should not be disclosed in the Dissertation. Acknowledgement should not be included in the Dissertation.
- g. Certificates issued by guide, countersigned by Head of the Department and the Dean certifying therein that the work done by the candidate has been carried out under the supervision of the guide to his/her entire satisfaction, should be submitted separately to the University.
- h. Dissertation approval is a prerequisite for appearing at the University exam. In case the Dissertation is not accepted; the same shall be communicated to the candidate along with reasons for rejection at least 2 months prior to the commencement of theory exam.
- i. The candidate may make necessary corrections and resubmit the Dissertation at least 1 month prior to the commencement of theory exam.

#### **B. Log Book (Work diary)**

The postgraduate students should include all their activities in the logbook. It will be useful for their future reference & to the department as a record.

#### **C. University Examination**

The university examination will comprise of theory and practical. To be eligible to be declared as successful in the PG Degree examination it is compulsory for the candidate to pass in theory and practical examination separately in the same attempt.

##### **a. Theory examination**

There shall be four question papers, each of three hours duration. Each paper will be of 100 marks.

Minimum passing percentage is 50%

##### **Paper I-**

General Pathology including General Neoplasia, Immunopathology and Recent Advances.

**Paper II-**

Systemic Pathology including Systemic Neoplasia and Recent Advances.

**Paper III-**

Haematology, Transfusion Medicine, Immunohaematology including Recent Advances.

**Paper IV-**

Clinical Pathology, Chemical Pathology, Pathology of infectious diseases, Cytopathology including Recent Advances.

Each paper will consist of

a) 3 LAQs of 20 marks each - **60**

b) 4 SAQs of 10 marks each - **40**

(4 out of 5)

**Total 100 marks**

**Marking Pattern for Theory Examination**

	Marks for individual Question				Total Marks	Minimum Marks per Paper	Minimum Passing Marks
	Q1	Q2	Q3	Q4			
	LAQ 1	LAQ 2	LAQ 3	4 SN out of 5			
Paper I	20	20	20	40	100	40	
Paper II	20	20	20	40	100	40	
Paper III	20	20	20	40	100	40	
Paper IV	20	20	20	40	100	40	
<b>Total Marks</b>				<b>400</b>			<b>200</b>

The candidate should score minimum 40 marks per paper and 200 out of total 400 marks in theory i.e. 50 %.

**b. Practical Examination**

Duration - 2 days (if candidates are more than 6, then the days of practical examination should be increased proportionately)

**Day 1:**

i) Clinical work will include		Exercise	Case discussion
Case 1 - urine examination/ fluid -	<b>25 marks</b>	<b>10</b>	<b>15</b>
Case 2 - biochemical test-	<b>25 marks</b>	<b>10</b>	<b>15</b>
Case 3 - haemogram with Special tests	<b><u>25 marks</u></b>	<b>10</b>	<b>15</b>
<b>Total</b>	<b>75 marks</b>		

Autopsy/ reconstructed autopsy - **20 marks**

ii) Gross/ Morbid Anatomy - **35 marks** (minimum 5 specimens- 7 marks each)

iii) Haematology and Cytology slides - **60marks**

(5 & 7 slides respectively, five minutes duration for each slide.)



**Day 2:**

- i) Histopathology slides- 28 slides- **140 marks**  
(The candidate should be assessed so as to evaluate performance in identifying common as well as rare lesions). Five minutes duration for each slide.)
- ii) Serology technique - **15 marks**  
(Including routine serology and Blood Bank technique)
- iii) Histopathological Techniques - **15 marks**  
1) Block cutting and staining- H & E  
2) Special stain- 1
- iv) Viva Voce: - **40 marks**  
Student will be examined by all the examiners together, about students' subject knowledge, comprehension, analytical approach, expression (topic discussion) and interpretation of data, and will include discussion related to dissertation.

**Marking scheme for practical examination**

<b>Sr. No.</b>	<b>Exercises</b>	<b>Maximum marks</b>
1.	Histopathology slides	140
2.	Clinical case	75
3	Haematology & Cytology slides	60
4.	Grossing	35
5.	Autopsy	20
6.	Histotechniques	15
7.	Serology	15
8.	Viva Voce	40
	<b>Total Marks</b>	<b>400</b>

**Final marking scheme for MD examination in Pathology**

<b>Heads of passing</b>	<b>'Maximum Marks'</b>	<b>Minimum marks for Passing</b>
Theory	400	200
Practical and viva voci	400	200
<b>Total Marks</b>	<b>800</b>	<b>400</b>