

**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**MD (PATHOLOGY) DEGREE EXAMINATION – OCTOBER 2019**  
**SUBJECT: PAPER I: GENERAL PATHOLOGY, PATHOPHYSIOLOGY,**  
**IMMUNOPATHOLOGY AND CYTOPATHOLOGY**

Tuesday, October 08, 2019

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

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✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the role of Cytokines and growth factors in tissue regeneration and wound healing.  
(15 marks)
2. Describe in detail the sequence of events in hypoxic injury to cells.  
(15 marks)

3. **Write short notes on:**

- 3A. Adhesion molecules in inflammatory response
- 3B. Cellular ageing
- 3C. Molecular biology of Gaucher's disease
- 3D. Mechanisms of induction of hypercalcemia in malignancy
- 3E. Pathogenesis of Cardiac edema
- 3F. Oncofetal antigens as tumor markers
- 3G. Anti-thrombotic properties of endothelium
- 3H. p21
- 3I. Mechanism of auto-immunity
- 3J. Acute phase reactants

(7 marks × 10 = 70 marks)



**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**MD (PATHOLOGY) DEGREE EXAMINATION – OCTOBER 2019**  
**SUBJECT: PAPER II: SYSTEMIC PATHOLOGY**

Wednesday, October 09, 2019

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Mention the WHO classification of lung cancer. Discuss the pathology and significance of immunohistochemistry in the diagnosis of bronchogenic carcinoma.

(6+6+3 = 15 marks)

2. Discuss the differential diagnosis of Neonatal jaundice. Briefly mention the role of immunohistochemistry in biliary pathology.

(10+5 = 15 marks)

3. **Write Short notes on:**

3A. List the tumours of adrenal medulla and discuss in detail the morphology of any one.

3B. Pathology of Rhabdoid tumor of the Kidney.

3C. Guidelines for HER2 neu testing and reporting.

3D. HIV related lesions of the salivary glands.

3E. Pathology and immunohistochemistry of Merkel cell carcinoma.

3F. Angioimmunoblastic lymphadenopathy.

3G. Pathogenesis of endometriosis.

3H. Endomyocardial biopsy.

3I. Classification and microscopic features of Urothelial neoplasms.

3J. Basaloid squamous cell carcinoma of the upper aerodigestive tract.

(7 marks × 10 = 70 marks)



**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**MD (PATHOLOGY) DEGREE EXAMINATION – OCTOBER 2019**  
**SUBJECT: PAPER III: HAEMATOLOGY, TRANSFUSION MEDICINE (BLOOD**  
**BANKING) AND LABORATORY MEDICINE**

Thursday, October 10, 2019

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

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✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the antibody screening tests in blood banking.

(15 marks)

2. List the indications and briefly discuss the basic principles for cerebrospinal fluid (CSF) examination. Discuss the differential diagnosis of CSF pleocytosis.

(2+7+6 = 15 marks)

3. **Write Short notes on:**

3A. Protein estimation in urine

3B. G6PD deficiency

3C. Discuss the principle of coulter technology

3D. Hairy cell leukemia

3E. Grey platelet syndrome

3F. Karyotyping

3G. Myelofibrosis

3H. International normalized ratio

3I. Diagnostic workup in pediatric microcytic hypochromic anemia.

3J. Quality control in a Clinical Pathology Laboratory

(7 marks × 10 = 70 marks)



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**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**MD (PATHOLOGY) DEGREE EXAMINATION – OCTOBER 2019**  
**SUBJECT: PAPER IV: RECENT ADVANCES AND APPLIED ASPECTS**

Friday, October 11, 2019

Time: 14:00 – 17:00 Hrs.

Max. Marks: 100

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✍ **Answer ALL the questions.**

✍ **Long Essay:**

1. Discuss the role of tumor stroma in neoplastic growth and progression. (15 marks)

2. Discuss FISH under following headings- technique, applications and diagnostic pitfalls (15 marks)

3. **Write short notes on:**

3A. Endometrial intra-epithelial neoplasia.

3B. Multi-step carcinogenesis of Colonic cancer.

3C. Role of Cytokeratin expression in metastasis of unknown origin.

3D. Metastasis genes.

3E. Recent advances in pathogenesis of septic shock.

3F. Inflammatory biomarkers of atherosclerosis.

3G. Minor histocompatibility antigens.

3H. Microscopic colitis.

3I. Effects of tamoxifen on female genital tract.

3J. Cytogenetics in the evaluation of renal tumors.

(7 marks × 10 = 70 marks)

