

April-2001

[KD 021]

Sub. Code : 135]

D.M. DEGREE EXAMINATION.

(Higher Specialities)

Branch IX — Rheumatology

(Revised Regulations)

Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. List the characteristics of the Th 1 and Th 2 responses. How do they contribute to the understanding of the rheumatic diseases. (25)
2. Describe the role of laboratory investigations in the assessment of the severity and outcome in progressive systemic sclerosis. (25)
3. Briefly discuss
 - (a) The laboratory and clinical diagnosis of AIDS (Acquired Immune Deficiency Syndrome)
 - (b) Extractable nuclear antigens.
 - (c) The rationale behind "pulse" immunosuppressive treatment of connective tissue diseases.
 - (d) The differential diagnosis of an X-ray of the hands showing the classical features of rheumatoid arthritis.
 - (e) Silicone as an instigator of rheumatic diseases. (5 × 10 = 50)

November-2001

[KE 021]

Sub. Code : 1351

D.M. DEGREE EXAMINATION

(Higher Specialities)

(Revised Regulations)

Branch IX — Rheumatology

Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY

Time : Three hours

Maximum : 100 marks

Answer ALL questions

Marks for each question are given in brackets.

1. Discuss the pathogenesis of the clinical features of Hypertrophic Osteoarthropathy. (30)
 2. Describe the Lupus Anticoagulant Test. Discuss its implications. (30)
 3. Write short notes on :
 - (a) Imaging in Early Rheumatoid Arthritis (10)
 - (b) T cells as targets of therapy (10)
 - (c) Matrix metalloproteinases (10)
 - (d) Apoptosis and Rheumatological Diseases. (10)
-

March-2002

[KG 021]

Sub. Code : 1351

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch IX — Rheumatology

**Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY**

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

Marks for each question are given in brackets.

1. Describe the clinical significance of various patterns seen on ANA testing on Hep II Cells by immunofluorescence. (30)
2. Discuss the autoantibodies associated with Dermato-polymyositis and their relationship with disease presentation. (30)
3. Write short notes on :
 - (a) Standardized radiological examination of the hand for clinical drug trials in Rheumatoid Arthritis. (10)
 - (b) Nutritional supply to articular cartilage. (10)
 - (c) Hypothalamic pituitary gonadal axis and rheumatological diseases. (10)
 - (d) Osteonecrosis. (10)

[KK 021]

Sub. Code : 1351

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch IX — Rheumatology

**Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY**

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

A. Essay : (2 × 15 = 30)

(1) Discuss various techniques, limitation and utilization of assays used in diagnosis of Anti-phospholipid antibody syndrome.

(2) Discuss purine metabolic pathway and the defects in aetiopathogenesis of gout.

B. Short notes.

(10 × 5 = 50)

- (1) ENA (Extractable Nuclear Antigen)
- (2) HLA and rheumatoid arthritis.
- (3) Stromolysis. (MMPZ).
- (4) Rheumatoid factor.
- (5) Rheumatoid nodule.
- (6) Ultrasound in rheumatology.
- (7) Synovial biopsy.
- (8) Endothelial cell.
- (9) Adhesion molecules.
- (10) C-ANCA.

February-2005

[KM 021]

Sub. Code : 1351

II. Short notes :

(10 × 5 = 50)

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch IX — Rheumatology

Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

I. Essay :

(2 × 15 = 30)

(1) Describe the biological actions of Vitamin D on bone and joints. Briefly mention the therapeutic applications and toxicities of hypervitaminosis D.

(2) 'Clinical applications of ultrasonography in Rheumatology' – Highlight this evolving area with specific examples.

(a) 'HONDA SIGN'

(b) Beta-2 Glycoprotein – 1

(c) Cyclooxygenase 2

(d) Ro – 52

(e) Immunoglobulin G subclasses

(f) Keratin sulphate

(g) Evaluation of soft tissue of heumatism

(h) Bone markers

(i) Acute Phase Reactants

(j) Thermography.

[KP 021]

Sub. Code : 1351

D.M. DEGREE EXAMINATION.

Branch IX — Rheumatology

(Higher Speciality)

(Revised Regulations)

Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY

Time : Three hours Maximum : 100 marks

Theory : Two hours and Theory : 80 marks
forty minutes

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL the questions.

Draw suitable diagrams wherever necessary.

I. Essays :

(1) Discuss the roles and limitations of thermography, CT scan, MRI scan and radionuclide scan in Rheumatology practice. (20)

(2) Describe the pathways of complement activation. Briefly mention the assay techniques. Elaborate the diagnostic and therapeutic uses of complements and its inhibitors in Rheumatology. (15)

(3) Discuss in detail about the genetic basis, immunochemical properties, methods of measurements, and pathophysiological role (in autoimmune diseases) of Rheumatoid factor. (15)

II. Write short notes on : (6 × 5 = 30)

(a) Anti cyclic citrullinated peptide (Anti CCP).

(b) Anti centromere antibody.

(c) DEXA scan.

(d) Ultra structure of myofibril.

(e) Pattern of pulmonary function abnormalities in Rheumatic diseases.

(f) Myositis specific antigens and the special syndromes associated with them.

[KR 021]

Sub. Code : 1351

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch IX — RHEUMATOLOGY

**Paper I — BASIC SCIENCES AND DIAGNOSTIC
PROCEDURES IN RHEUMATOLOGY AND
CLINICAL IMMUNOLOGY**

Time : Three hours

Maximum : 100 marks

**Theory : Two hours and
forty minutes**

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL the questions.

Draw suitable diagrams wherever necessary.

I. Essay :

- 1. Discuss innate immunity. (20)**
- 2. Discuss different methods of detecting antinuclear antibody and their impact in clinical application. (15)**
- 3. Discuss biology of normal joint. (15)**

II. Write short notes on :

(6 × 5 = 30)

- (a) Bone markers**
 - (b) ANCA**
 - (c) Elastin**
 - (d) Dendritic cells**
 - (e) HLA-B27**
 - (f) Muscle Biopsy in polymyositis.**
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August 2008

[KT 021]

Sub. Code: 1351

D.M. DEGREE EXAMINATION

(Higher Specialities)

(Revised Regulations)

Branch IX – Rheumatology

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three hours

Maximum: 100 Marks

ANSWER ALL QUESTIONS

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40 Marks

1. Discuss genes that are important in lupus pathogenesis. Briefly describe the important epigenetic factors and various methodologies employed in the study of lupus genetics.
2. Discuss the role of peptidylarginine deiminase (PAD) in the immunobiology of Rheumatoid Arthritis.

II. Write short notes on:

10 x 6 = 60 Marks

1. B Lymphocytes.
 2. Th 17 cells
 3. Jumping genes.
 4. TGF beta signalling in systemic sclerosis.
 5. Minor salivary gland biopsy.
 6. Myositis specific antibodies.
 7. Antinuclear antibodies.
 8. Endothelial dysfunction.
 9. Cartilage engineering.
 10. Chronobiology and rheumatic diseases.
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August 2009

[KV 021]

Sub. Code: 1351

D.M. DEGREE EXAMINATION

(Higher Specialities)

Branch IX – RHEUMATOLOGY

(Revised Regulations)

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three hours

Maximum: 100 Marks

Answer ALL questions

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40

1. Discuss in detail about the various human major histocompatibility complexes and human leucocyte antigens, their association and clinical relevance in individual rheumatic diseases.
2. Describe in detail about the genetic basis, structure, immunochemical properties, methods of measurements and pathophysiological role of anti ds – DNA in autoimmune diseases.

II. Write short notes on:

10 x 6 = 60

1. Genomic effects of glucocorticoids.
2. Diagnostic arthroscopy.
3. Structure and functions of fibroblast.
4. Rheumatoid factor – uses and fallacies.
5. Bone markers in rheumatology.
6. Ultra structure of myofibril.
7. Role of leucotrienes in chronic inflammation.
8. Elastin.
9. Methods of measurements of bone mineral density.
10. Uses of ultrasonography in rheumatology.

AUGUST 2010

[KX 021]

Sub. Code: 1351

D.M. DEGREE EXAMINATION

**(Higher Specialities)
(Revised Regulations)**

Branch IX – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSIC PROCEDURES
IN RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three hours

Maximum: 100 Marks

ANSWER ALL QUESTIONS

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40 Marks

1. Describe the mechanism of tolerance, add a brief note on mechanism responsible in break down of tolerance.
2. What are biomarkers used in rheumatic diseases. Discuss them with reference to Osteoarthritis.

II. Write short notes on:

10 X 6 = 60 Marks

1. Monocytes.
2. Interleukin 17.
3. Anti-nucleosome antibody.
4. Immunoglobulin.
5. Arterial biopsy.
6. PCR in rheumatology.
7. Chondrocalcinosis.
8. Osteoclasts.
9. Complement system.
10. Antigen presenting cell.

August 2011

[KZ 021]

Sub. Code: 1351

**DOCTORATE OF MEDICINE (D.M.) DEGREE EXAMINATION
(SUPER SPECIALITIES)**

BRANCH IX – RHEUMATOLOGY

**BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

**Time : 3 hours
(180 Min)**

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Describe the cell recruitment in the pathogenesis of arthritis and add a note on angiogenesis.	11	35	15
2. Write essay on the Neurologic regulation of inflammation.	11	35	15

II. Write notes on :

1. A Disintegrin and metalloproteinase (ADAM) family.	4	10	7
2. Immunoblotting.	4	10	7
3. Anti-streptococcal antibodies.	4	10	7
4. Role of Nitric oxide in rheumatic diseases.	4	10	7
5. Quantitative ultrasound.	4	10	7
6. T-cell vaccination.	4	10	7
7. IL-1 trap.	4	10	7
8. Capture enzyme immunoassay.	4	10	7
9. Arthrocentesis.	4	10	7
10. Chromatin associated antigens.	4	10	7

[LB 021]

AUGUST 2012

Sub. Code: 1351

D.M – RHEUMATOLOGY

**Paper – I BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

**Time: 3 hours
(180 Min)**

Maximum: 100 marks

Answer ALL questions in the same order.

I. Elaborate on:

	Pages (Max.)	Time (Max.)	Marks (Max.)
1. Describe in detail about the B cell development B cell functions and immunoglobulin.	16	35	15
2. Discuss the morphology, classification and normal function of chondrocytes.	16	35	15

II. Write notes on:

1. What is spotted DNA microarrays?	4	10	7
2. What are regulatory T cells?	4	10	7
3. What are the products of neutrophils?	4	10	7
4. What are the main phases of the gait cycle?	4	10	7
5. How is the joint innervated?	4	10	7
6. How does bone resorption occur in rheumatoid arthritis?	4	10	7
7. What are integrins? Add a note on their functions.	4	10	7
8. What are the negative regulators of B cell activation?	4	10	7
9. What is the role of apoptosis in relation to rheumatic diseases?	4	10	7
10. What are the collagen markers? Discuss them in brief.	4	10	7

(LD 021)

AUGUST 2013

Sub. Code:1351

D.M. – RHEUMATOLOGY
Paper – I BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY
Q.P.Code: 161351

Time: Three Hours

Maximum: 100 marks

I. Elaborate on:

(2X15=30)

1. Classification of joints. Developmental biology of diarthrodial joints.
2. Role of T cells in innate immune response. Describe Th17 cells and their role in normal and pathological situation in Rheumatology.

II. Write notes on:

(10X7=70)

1. IL-6.
2. Bone Markers.
3. Insulin like growth factors.
4. Osteoclasts.
5. Dendritic cells.
6. Neutrophil Granules.
7. Genome wide association studies.
8. Angiogenesis in Autoimmunity.
9. Death Ligands, Receptors and signals.
10. Neurogenic regulation of inflammation.

D.M. – RHEUMATOLOGY

**PAPER I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code : 161351

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 15 = 30)

1. Structure and constituents of bone, bone remodeling and osteoimmunology.
Add a note on bone markers and different techniques for assessing bone density.
2. Complement system - describe activation pathways and regulatory proteins.
Functions of complement system in immune response.
Role of complements in autoimmune diseases.
Add a short note on assays for complement activation.

II. Write notes on :

(10 x 7 = 70)

1. Chemokines.
2. Toll like receptors.
3. Adhesion molecules.
4. Antineutrophil cytoplasmic antibodies (ANCA).
5. Epigenetics in autoimmunity.
6. Th17/IL-23 pathway.
7. Tiers of Tolerance.
8. Markers of extracellular matrix modeling.
9. Indirect immunofluorescence-technique and disease associations.
10. Maturation and activation of B cells.

[LI 021]

FEBRUARY 2016

Sub. Code: 1351

D.M. – RHEUMATOLOGY

**PAPER I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code : 161351

Time : Three Hours

Maximum : 100 marks

Answer ALL questions

I. Elaborate on:

(2 x 15 = 30)

1. Structure of synovium, synovial cells and function. Write a note on synovial vasculature and synovial fluid analysis in various rheumatologic conditions.
2. Mention different forms of cell death. Write in detail about different pathways of apoptosis, laboratory diagnosis of apoptosis and relevance of apoptosis in relation to Rheumatic diseases.

II. Write notes on :

(10 x 7 = 70)

1. Cytokines with primary role in regulation of T cells.
2. B cell development.
3. Platelet in health and disease.
4. Markers of collagen synthesis.
5. Proteomics in rheumatology.
6. Nail fold capillaroscopy.
7. Antiphospholipid antibodies.
8. Experimental models of scleroderma.
9. Natural Killer cells.
10. DNA methylation in epigenetics.

(LJ 021)

AUGUST 2016

Sub. Code:1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P.Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Write an essay on B cell development.
2. Discuss about the events during muscle contraction.

II. Write notes on:

(10 x 7 = 70)

1. Kinematics.
2. Lipoxins.
3. Langerhan's cells.
4. Apoptotic cell recognition receptors.
5. Eosinophil granules.
6. HLA typing.
7. Wnt signalling in osteoarthritis.
8. Biomechanics of joint.
9. Epitope spreading.
10. IL-33.

(LL 021)

AUGUST 2017

Sub. Code:1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P.Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: (2 x 15 = 30)

1. Discuss C-Reactive Protein (CRP) in relation to its origin, source, structure, biological actions and genetics. How is it assayed? Note on high sensitive CRP.
2. What are Genome wide association studies (GWAS)? Discuss GWAS studies in rheumatic diseases and their relevance.

II. Write notes on: (10 x 7 = 70)

1. Autophagy.
2. Bone regeneration.
3. Serine Proteinases.
4. Cathepsins.
5. Interferons.
6. Receptor Editing.
7. Eosinophil granules.
8. Linkage disequilibrium.
9. Anergy.
10. FC receptors.

(LM 021)

FEBRUARY 2018

Sub. Code: 1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P.Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Structure, constituents, function and innervation of synovium. Formation of synovial fluid. Briefly describe synovial fluid analysis in different rheumatic diseases and principles and application of polarising microscopy.
2. Major histocompatibility complex (MHC) and antigen presentation, endogenous and exogenous antigen processing pathways. Role of Human leucocyte antigens (HLA) in susceptibility and pathogenesis of rheumatic diseases. Add a note on HLA typing.

II. Write notes on:

(10 x 7 = 70)

1. IL-36.
2. Innate like lymphocytes.
3. Adipokines in rheumatic diseases.
4. Autoantibodies in SLE.
5. Non-coding RNA in autoimmunity.
6. T reg cells.
7. Immunoelectrophoresis.
8. Integrins.
9. Apoptosis and rheumatic diseases.
10. Synthesis, assembly and secretion of immunoglobulins.

(LN 021)

AUGUST 2018

Sub. Code: 1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P.Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Structure of Human adult articular cartilage. Elaborate on cartilage collagens and other extra cellular matrix components of cartilage. Add a note on chondrogenesis. Also write in short about culture models for studying chondrocyte metabolism.
2. Describe lymphocyte migration. Write about structure and organisation of primary and secondary lymphoid tissues.

II. Write notes on:

(10 x 7 = 70)

1. Biology of Tumor Necrosis Factor α .
2. T-regulatory cells.
3. Mast cells.
4. Metalloproteinases.
5. Nephelometry.
6. Anti-Ro52 antibodies.
7. Experimental models of systemic lupus erythematosus.
8. Inflammasomes.
9. Theories of autoimmunity.
10. Gender and autoimmunity.

(LP 021)

AUGUST 2019

Sub. Code: 1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Discuss biomechanics of spine in health and disease.
2. Explain NF Kappa B mediated cell signal transduction.

II. Write notes on: **(10 x 7 = 70)**

1. Platelet microparticles.
2. Animal models of lupus.
3. Immune privileged tissue.
4. Proteomics and its applications.
5. Antigen processing and presentation.
6. Immunological tolerance.
7. Vitamin D and its immunomodulatory actions.
8. DNA sequencing.
9. Principles of Biobanking.
10. Thermography.

(LR 021)

**NOVEMBER 2020
(AUGUST 2020 SESSION)**

Sub. Code: 1351

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

**Time: Three Hours
Marks**

Maximum: 100

I. Elaborate on: (2 x 15 = 30)

1. Explain epigenetics of rheumatic diseases. Write in detail about how epigenetics revolutionized the management of rheumatic diseases.
2. Discuss antigenic diversity and B cell response. Mention genetic mechanisms underlying this in rheumatic diseases.

II. Write notes on: (10 x 7 = 70)

1. Extracellular matrix components of articular cartilage
2. Joint constraint and stability
3. Noncanonical inflammasome
4. CXC chemokines in arthritis
5. Animal models of auto immunity
6. Linkage disequilibrium
7. Sarcopenia
8. Pyroptosis
9. Signaling pathways in platelet activation
10. Targeted complement therapeutics

D.M. – RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES IN
RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Explain T Cell maturation, differentiation and activation. Mention briefly about further downstream activation of other immune cells.
2. Discuss antigenic diversity and B Cell response. Mention genetic mechanisms underlying this.

II. Write notes on: **(10 x 7 = 70)**

1. Discuss genetic risk factors for developing ankylosing spondylitis. Mention findings of recent GWAS studies and percentage attributable to these risks.
2. Discuss the roles of innate and adaptive immunity in SLE. Explain immunopathogenesis of lupus nephritis?
3. Mention mouse models for systemic sclerosis and their key features. Discuss Scleroderma fibroblast as against normal fibroblast.
4. Discuss pathophysiology and immunopathogenesis of dermatomyositis and Polymyositis.
5. Name the muscles of the rotator cuff and mention their origin, insertions and actions.
6. Explain principles, techniques, troubleshooting and applications of polarizing microscopy in rheumatology.
7. Write briefly on principles, strengths and weaknesses of meta-analysis, randomized controlled trials, cohort studies and case controlled studies.
8. Discuss Inflammasome. Explain immune mechanisms involved in pathogenesis of Gout.
9. (i) Draw the transverse section of a skeletal muscle, and label the structures.
(ii) Draw the transverse section of a spinal nerve and label the structures.
10. Explain the arches of the foot. Give three non-inflammatory causes for each of forefoot, mid foot and hind foot pain.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[DM 0822]

AUGUST 2022

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**Paper I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: (2 x 15 = 30)

1. Draw structure of myofibril. Discuss the development of muscle and various rheumatic diseases associated with muscle abnormalities.
2. Write in detail about clinical research methods in rheumatic diseases.

II. Write notes on: (10 x 7 = 70)

1. Enchondral ossification.
2. Osteoclast in rheumatic diseases.
3. Autologous Chondrocyte transplantation.
4. Tissue Engineering in Arthritis.
5. Respiratory burst.
6. mTOR pathway.
7. Mechanisms of autophagy.
8. Mast cells in Arthritis.
9. Necroptosis and Ferroptosis.
10. Chemokines in HIV pathogenesis.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[DM 0223]

FEBRUARY 2023

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**PAPER I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: (2 x 15 = 30)

1. Explain shared epitope in the context of Rheumatoid Arthritis (RA). Mention the key genetic associations in RA. What is the current understanding on the role of Microbiome in the etiology of RA? Briefly outline the signal transduction and transcription factors in RA.
2. Which are all the environmental factors which could play a role in the pathogenesis of Systemic Lupus Erythematosus (SLE)? Briefly explain the role of Innate System activation in SLE. Briefly explain the mechanisms of renal damage in SLE.

II. Write notes on: (10 x 7 = 70)

1. Explain the disease activity assessment tools available for juvenile onset Idiopathic Inflammatory Myositis.
2. Different Anti Nuclear Antibody (ANA) detection methods.
3. Macrophages and its role in pathogenesis of Autoimmune Rheumatic Diseases.
4. Explain the role of Wnt pathway and its implications in Osteoarthritis and Osteoporosis.
5. MRI changes in spine and sacroiliac joint in Spondyloarthritis as defined by ASAS.
6. Microparticles and Exosomes and their utility in diagnosis and follow up of rheumatic diseases.
7. T cell receptor complex and activation of T cells.
8. Name the muscles of the rotator cuff and mention their origin, insertions and actions.
9. Explain principles, techniques, troubleshooting and applications of polarizing microscopy in Rheumatology.
10. Write briefly on principles, strengths and weaknesses of meta-analysis, randomized controlled trials, cohort studies and case controlled studies.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[DM 0823]

AUGUST 2023

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**PAPER I – BASIC SCIENCES AND DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY AND CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Discuss the mechanisms of immune regulation by neuronal pathways. Elaborate on the various neuro-modulatory therapeutic options for the treatment of autoimmune rheumatic diseases.
2. Discuss the principles, strengths and weakness of various imaging modalities in the management of Gout.

II. Write notes on: **(10 x 7 = 70)**

1. Propensity matching.
2. Nail fold capillaroscopy in systemic sclerosis and myositis.
3. Single cell RNA sequencing in delineating lupus pathophysiology.
4. Metabolomics and its role in understanding autoimmune rheumatic diseases.
5. Discuss the principle, interpretation, advantages and disadvantages of indirect immunofluorescence for detecting anti nuclear antibodies.
6. Discuss the proposed mechanisms of flare in rheumatoid arthritis.
7. Role of IL-17/IL-23 axis in spondyloarthritis.
8. Interpretation of synovial fluid findings and the diagnostic utility of doing synovial aspiration in patients with musculoskeletal Rheumatic diseases.
9. Pathophysiology of CPPD.
10. Immune synapse.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[DM 0124]

JANUARY 2024

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**PAPER I – BASIC SCIENCES & DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY & CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on: **(2 x 15 = 30)**

1. Describe in detail about the developmental biology of the diarthrodial joint with the relevant pictorial diagrams.
2. Describe the various signaling pathways and cells involved in joint homeostasis and surface repair.

II. Write notes on: **(10 x 7 = 70)**

1. Role of Neurophysiological tests in Auto immune inflammatory Rheumatic diseases.
2. Antigen processing and presentation by MHC I molecules.
3. Mast cells in arthritis.
4. Differences between the acquired and innate immune system.
5. Direct Immunofluorescence test in Rheumatology.
6. Anatomy of the human adult articular cartilage with the relevant diagram.
7. Immunological functions of Thymus.
8. ITAMs (Immunoreceptor tyrosine based activation motifs).
9. Vitamin D Metabolism.
10. Discuss the pathologic findings in Large Vessel Vasculitis.

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[DM 0824]

AUGUST 2024

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**PAPER I – BASIC SCIENCES & DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY & CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. Describe in detail about the Immune antigen receptor systems.
2. Describe in detail about the Cytokine signaling pathways involved in Cartilage Metabolism.

II. Write notes on:

(10 x 7 = 70)

1. Temporal artery Biopsy.
2. Enumerate the human antimicrobial proteins at epithelial surface.
3. Fibroblast in Rheumatoid arthritis synovium.
4. Joint resident stem cells.
5. Flow cytometry -principles and clinical applications.
6. OR pathway.
7. Animal models of autoimmunity.
8. Neutrophil extracellular traps.
9. Regulation of complement activation.
10. Adjuvant induced arthritis.

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[DM 0225]

FEBRUARY 2025

Sub. Code :1351

D.M. - CLINICAL IMMUNOLOGY AND RHEUMATOLOGY

**PAPER I – BASIC SCIENCES & DIAGNOSTIC PROCEDURES
IN RHEUMATOLOGY & CLINICAL IMMUNOLOGY**

Q.P. Code: 161351

Time: Three Hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 15 = 30)

1. a) Mention causes of Monogenic Lupus.
b) What are the implications of epigenetic mutations for lupus?
c) The role of cytokines of the innate and adaptive immune system in Lupus.
d) The pathophysiology of neuropsychiatric lupus.
2. Explain shared epitope in the context of Rheumatoid Arthritis (RA). What is the current understanding of the role of Microbiome in the etiology of RA? Briefly outline the signal transduction and transcription factors in RA.

II. Write notes on:

(10 x 7 = 70)

1. Various imaging modalities used to diagnose large vessel vasculitis.
2. Name the muscles of the rotator cuff and mention their origin, insertions, and actions.
3. a) Describe the Histology of bone.
b) Explain the interaction between different cell types of the bone other than those in the marrow and their role in maintaining the structure of the bone.
4. Mechanism of action of Glucocorticoids and basis of its toxicity.
5. Role of HLA B27 and Gut dysbiosis in the pathogenesis of Ankylosing Spondylitis.
6. IL-1 superfamily cytokines and their role in rheumatic diseases.
7. Principles of ANCA testing by Indirect Immuno Fluorescence.
8. Entrapment syndromes.
9. Multifocal avascular necrosis.
10. New developments in dendritic cell classification.
