

[KD 064]

Sub. Code : 1401

4

Write short notes on :

(4 × 10 = 40)

D.M. DEGREE EXAMINATION

(Higher Specialities)

(Revised Regulations)

Branch X — Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS

Time : Three hours

Maximum : 100 marks

Answer ALL questions

1. Discuss structure and function of von-Willebrand factor. Outline its role in pathogenesis of thrombotic thrombocytopenic purpura. (20)
2. Discuss biochemical and genetic control of apoptosis. Give an account of its relevance in normal haemopoiesis and haematological malignancies. (20)
3. Discuss structure and chemistry of DNA. Outline common molecular techniques giving their principles and applications in inherited haematological disorders. (20)

March-2002

[KG 064]

Sub. Code : 1401

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Haematology

**Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS**

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

1. Discuss endothelium and its role in regulation of haemostasis. (20)
2. Enumerate common molecular techniques. Discuss molecular pathophysiology of chronic myeloid leukaemia, outlining its impact in development of newer therapies. (20)
3. Discuss common cytogenetic techniques and their applications in inherited haematological disorders. (20)
4. Write short notes on : (4 × 10 = 40)
 - (a) Genomic diversity
 - (b) Glycophorin
 - (c) Homocysteine cycle
 - (d) CD52.

[KH 064]

Sub. Code : 1401

4

Write short notes on :

(4 × 10 = 40)

D.M. DEGREE EXAMINATION

(Higher Specialities)

(Revised Regulations)

Branch X — Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIETIC

Time : Three hours

Maximum : 100 marks

Answer ALL questions

1. Describe the mechanism of gene expression. Explain how the gene mutations cause haemoglobinopathies. (20)
2. Describe adhesion molecules. Explain how the defects in adhesion molecules cause disease giving any two examples. (20)
3. Describe the steps involved in complement system. Explain the basic defects in paroxysmal nocturnal haemoglobinuria and the laboratory tests that helps in evaluation of those defects. (20)

- (a) Survivin
- (b) Ceramide
- (c) Gene therapy
- (d) Mutations which cause resistance to activated Protein C.

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Sub. Code : 1401

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Clinical Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HEMOPOIETIC SYSTEM MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HEMOPOIESIS

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 Questions : (2 × 15 = 30)

1. What is the current understanding of the mechanism of blood clotting and the pathogenesis of thrombophilia?

2. Describe the organization of the gene and its function. Describe the regulation of gene function.

B. Short notes : (10 × 5 = 50)

1. Amegakaryocytic thrombocytopenia
 2. Folic acid and thrombosis
 3. PCR
 4. Tyrosine kinase
 5. NK cells
 6. Dyskeratosis congenita
 7. Protease activated receptors
 8. ADAMTS
 9. Gardos effect
 10. Hypomethylating agents.
-

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Sub. Code : 1401

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS

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 Questions : (2 × 15 = 30)

(1) Structure and function of the bone marrow
microenvironment.

(2) Genetics of inherited thrombocytopenia.

II. Short notes : (10 × 5 = 50)

- (a) Applications of Real time PCR.
- (b) Interleukin 6 and its receptor.
- (c) Costimulatory molecules involved in T-cell
activation.
- (d) P-selectin.
- (e) Role of apoptosis in MDS.
- (f) Genetics of hereditary Sideroblastic
anaemia.
- (g) Classic pathway of Complement.
- (h) Thrombomodulin.
- (i) Thrombopoietin.
- (j) Congenital leukemia.

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II. Short notes :

(10 × 5 = 50)

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS

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 questions :

(2 × 15 = 30)

(1) Discuss the concept of the haemopoietic stem cell.

(2) Define and classify oncogenes and discuss its implication in the pathogenesis of haematologic neoplasms.

- (a) The compliment system
- (b) Progenitor cell leukemia
- (c) Pseudo-genes
- (d) Suicide cancer gene therapy
- (e) Genetics of Thalassemia
- (f) Interleukin - 2
- (g) p 53 gene
- (h) Function of CD₄ and CD₈
- (i) Erythropoietin
- (j) Application of fish in haematology (FISH -
Fluorescence in situ hybridation Technique).

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D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Clinical Haematology

Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS

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 Questions :

(1) Discuss the modern concept of haemopoietic cell differentiation to various functioning haemopoietic cells with evidences from cultural studies and implication of various growth factors in helping the differentiation process. (20)

(2) Vitamin B₁₂ and Folic Acid interaction and haemopoiesis. (15)

(3) Discuss the concept of gene therapy for haematological disorders. (15)

II. Short notes :

(6 × 5 = 30)

(a) Congenital dyserythropoietic anaemia.

(b) Serum transferrin receptors.

(c) G-CSf.

(d) Standard Giemsa banded Karyotype in haematological malignancy.

(e) PCR reaction.

(f) Phagocytosis.

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III. Short notes : (6 × 5 = 30)

D.M. DEGREE EXAMINATION.

(Higher Specialities)

(Revised Regulations)

Branch X — Clinical Haematology

**Paper I — STRUCTURE AND FUNCTION OF THE
HAEMOPOIETIC SYSTEM, MOLECULAR BIOLOGY
AND GENETIC ASPECTS OF HAEMOPOIESIS**

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

1. Importance of BCR ABL in leukemias.
 2. Gene therapy for β -thalassemia.
 3. Bone marrow structure and function
 4. Polymerase chain reaction.
 5. Human leucocyte antigen (HLA) system.
 6. Gene expression profiling by microarray analysis.
-

Answer ALL questions.

I. Essay question : (20)

1. Discuss the impact of translational research in haematological disorders.

II. Essay questions : (2 × 15 = 30)

1. Haematopoietic growth factors.

2. Define “plasticity/transdifferentiation” potential of stem cells in cardiac diseases.

August 2008

[KT 064]

Sub. Code: 1401

D.M. DEGREE EXAMINATION

(Higher Specialities)

Branch X – Clinical Haematology

(Revised Regulations)

**Paper I – STRUCTURE AND FUNCTION OF THE HAEMOPOIETIC
SYSTEM, MOLECULAR BIOLOGY AND GENETIC
ASPECTS OF HAEMOPOIESIS**

Q.P. Code: 161401

Time: Three hours

Maximum: 100 Marks

Answer ALL questions

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40

1. Discuss the changes in the site, morphology and nature of haemopoiesis from embryonic stage to adult life with suitable diagram.
2. Discuss the structure and function of different areas of a lymph node with suitable diagram.

II. Write short notes on:

10 x 6 = 60

1. Ferrokinetics, its application in haematology.
2. Erythropoietin.
3. Restriction Fragment length polymorphism.
4. Alternative pathway of complement activation.
5. Modern cell based theory of blood coagulation.
6. Euchromatin and Heterochromatin in a cell.
7. One carbon metabolism in haematology.
8. Histone and gene action.
9. Morphological change in myeloid cells in myelodysplasia.
10. Principles of sequencing a gene with known sequence.

August 2009

[KV 064]

Sub. Code: 1401

D.M. DEGREE EXAMINATION

(Higher Specialities)

Branch X – CLINICAL HAEMATOLOGY

(Revised Regulations)

**Paper I – STRUCTURE AND FUNCTION OF THE HAEMOPOIETIC
SYSTEM, MOLECULAR BIOLOGY AND GENETIC
ASPECTS OF HAEMOPOIESIS**

Q.P. Code: 161401

Time: Three hours

Maximum: 100 Marks

Answer ALL questions

Draw suitable diagrams wherever necessary.

I. Essays:

2 x 20 = 40

1. Monocyte – Macrophage system.
2. Describe the coagulation cascade.

II. Write short notes on:

10 x 6 = 60

1. Anemia of inflammation.
2. Factor XIII.
3. RH blood group system.
4. PIG – A mutations.
5. Molecular pathogenesis of APML.
6. Pathogenesis of bone disease in myeloma.
7. NK Cell.
8. The cell cycle.
9. Immunoglobulin structure.
10. Hybridoma.

August 2011

[KZ 064]

Sub. Code: 1401

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

BRANCH X – CLINICAL HAEMATOLOGY

**STRUCTURE AND FUNCTION OF THE HAEMOPOIETIC SYSTEM,
MOLECULAR BIOLOGY AND GENETIC ASPECTS OF HAEMOPOIESIS**

Q.P. Code: 161401

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

Maximum : 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

**Pages Time Marks
(Max.) (Max.) (Max.)**

- | | | | |
|--|----|----|----|
| 1. Describe the hematopoietic stem cell niche and its relevance to hematopoiesis as well pathogenesis of hematological diseases. | 11 | 35 | 15 |
| 2. Describe the current understanding of the platelet vessel wall interaction and give examples of the defects in the common platelet disorders. | 11 | 35 | 15 |

II. Write notes on :

- | | | | |
|---|---|----|---|
| 1. Clonogenic DNA (cDNA) | 4 | 10 | 7 |
| 2. Quantitative PCR | 4 | 10 | 7 |
| 3. Common mutations in the thalassemias and their detection methods | 4 | 10 | 7 |
| 4. bcr-abl translocation and mutations in this region. | 4 | 10 | 7 |
| 5. JAK 2 mutation | 4 | 10 | 7 |
| 6. Dendritic cells | 4 | 10 | 7 |
| 7. T cell gene receptor | 4 | 10 | 7 |
| 8. Platelet granules | 4 | 10 | 7 |
| 9. B cell ontogeny | 4 | 10 | 7 |
| 10. Mesenchymal stromal cells | 4 | 10 | 7 |

[LB 064]

AUGUST 2012

Sub. Code: 1401

D.M – CLINICAL HAEMATOLOGY

**Paper – I STRUCTURE AND FUNCTION OF THE HAEMOPOIETIC SYSTEM,
MOLECULAR BIOLOGY AND GENETIC ASPECTS OF HAEMOPOIESIS**

Q.P. Code: 161401

Time: 3 hours

Maximum: 100 marks

(180 Min) Answer ALL questions in the same order.

I. Elaborate on:

**Pages Time Marks
(Max.)(Max.)(Max.)**

- | | | | |
|--|----|----|----|
| 1. Discuss the molecular mechanisms underlying the regulation of systemic iron homeostasis with particular emphasis on the role of hepcidin. | 16 | 35 | 15 |
| 2. Describe the various stages of B cell lymphopoiesis including commitment and response to antigenic stimuli. | 16 | 35 | 15 |

II. Write notes on:

- | | | | |
|--|---|----|---|
| 1. Transcription factors involved in lineage selection by hematopoietic cells. | 4 | 10 | 7 |
| 2. Stem cell mobilization. | 4 | 10 | 7 |
| 3. Genetic defects in hemochromatosis. | 4 | 10 | 7 |
| 4. Locus control region. | 4 | 10 | 7 |
| 5. Telomere. | 4 | 10 | 7 |
| 6. Hematopoietic stem cell niche. | 4 | 10 | 7 |
| 7. WT1 antigen. | 4 | 10 | 7 |
| 8. "ALIP" in the bone marrow. | 4 | 10 | 7 |
| 9. Bone marrow microenvironment in multiple myeloma. | 4 | 10 | 7 |
| 10. PCR in molecular genetics. | 4 | 10 | 7 |

(LD 064)

AUGUST 2013

Sub. Code:1401

D.M. – CLINICAL HAEMATOLOGY
Paper – I STRUCTURE AND FUNCTION OF THE HEMOPOIETIC
SYSTEM MOLECULAR BIOLOGY AND GENETIC ASPECTS OF
HAEMOPOIESIS
Q.P.Code: 161401

Time: Three Hours

Maximum: 100 marks

I. Elaborate on:

(2X15=30)

1. What is angiogenesis? Briefly explain its role in haematological diseases and drugs used to inhibit angiogenesis.
2. Classify immunosuppressive drugs and briefly explain their mechanism of action with special reference to Graft Versus Host Disease.

II. Write notes on:

(10X7=70)

1. Prion diseases.
2. Gene therapy.
3. JAK inhibitors.
4. Carfilzomib.
5. Comparative genome hybridization (CGH).
6. Complement system.
7. Gap PCR.
8. FLT3 inhibitors.
9. Confirmation sensitive gel electrophoresis (CSGE).
10. Role of multimer analysis in von Willebrand disease.
