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

[MD 1224] DECEMBER 2024 Sub. Code: 4061
(OCTOBER 2024 EXAM SESSION)

M.D. DEGREE EXAMINATION

IMMUNOHAEMATOLOGY AND BLOOD TRANSFUSION
PAPER I – BASIC APPLIED ASPECTS RELATED TO TRANSFUSION MEDICINE (INCLUDING HEMATOLOGY & IMMUNOLOGY)

Q.P. Code: 204061

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(1 x 20 = 20)**

1. Elaborate about Complement system and its application in Transfusion Medicine.

II. Short notes: **(8 x 10 = 80)**

1. Agglutination Reactions.
2. Immune Tolerance.
3. Cytokines.
4. Monoclonal Antibodies.
5. Draw coagulation cascade and discuss about the Convergent Model of coagulation.
6. Extra Cellular matrix - Its role in haematopoiesis.
7. A 65years old male with H/o chronic Renal failure presents with Hb: 5.5 g/dl, Platelet count 2 lakh/mm^3, TLC: 6000/ml, serum ferritin is 200 mg/dl, serum iron 30mg/dl and TIBC 280ng/L.
   a) What is the type of Anaemia?
   b) What are the treatment modalities?
   c) What is the role of Blood and Blood Components?
8. A donor was rejected by a blood center citing a Haemoglobin level of <12.5 gms% done by copper sulphate method. As per his physicians request complete haemogram was done which revealed a haemoglobin level of 13.2gms%.
   a) Mention the QC parameters for the copper sulphate solution.
   b) Preparation of copper sulphate solution.

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[MD 0525] **MAY 2025** **Sub. Code: 4061**

M.D. DEGREE EXAMINATION

IMMUNOHAEMATOLOGY AND BLOOD TRANSFUSION
PAPER I – BASIC APPLIED ASPECTS RELATED TO TRANSFUSION MEDICINE (INCLUDING HEMATOLOGY & IMMUNOLOGY)

Q.P. Code: 204061

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(1 x 20 = 20)**

1. Describe in detail about the Structure, function and various antigens present on platelets and their clinical significance. Add a note on The Platelet Storage Lesion.

II. Short notes: **(8 x 10 = 80)**

1. a) Pathophysiology of haemorrhagic shock.
   b) Plasma volume expanders.
2. Discuss on HDFN and various methods to detect Feto-maternal haemorrhage.
3. Hematopoietic stem cell niche in health and disease.
4. Draw coagulation cascade. Discuss cellular model of coagulation.
5. a) Describe mechanisms that regulate hemoglobin synthesis.
   b) Hemoglobin-based oxygen carriers
6. Hepatitis C Virus Structure and Its laboratory Diagnosis.
7. The technologist working on the case suspects an antibody with the characteristic property of "high-titer/low-avidity" (HTLA) reactivity. Titration of the antibody is performed as given below

serum titration									
	Undiluted	1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256
Pat serum	1+	1+	1+	1+	1+	1+	1+	W	0

   a) Does the serum titration result support or suspicion of a HTLA antibody?
   b) Are HTLA antibodies clinically significant?
   c) List at least three examples of HTLA antibodies.
   d) How does the trypsin enzyme panel help?
8. An 8-year-old male with sickle cell disease had been inpatient 1 week prior for ACS and now presents to your emergency department with back pain and increased scleral icterus. When he was discharged from the hospital, his hemoglobin was 10 gm/dL and is now 6 gm/dL. His reticulocyte count is <3% and his DAT is 3+ for IgG. The eluate of the DAT-positive cells reveals an antibody specificity for Fy^a.
   a) What is the most likely diagnosis?
   b) Write the Pathophysiology and laboratory features.

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

[MD 1025] **OCTOBER 2025** **Sub. Code: 4061**

M.D. DEGREE EXAMINATION

IMMUNOHAEMATOLOGY AND BLOOD TRANSFUSION

PAPER I – BASIC APPLIED ASPECTS RELATED TO TRANSFUSION MEDICINE (INCLUDING HEMATOLOGY & IMMUNOLOGY)

Q.P. Code: 204061

Time: Three Hours **Maximum: 100 Marks**

I. Elaborate on: **(1 x 20 = 20)**

1. Red cells Membrane structure and function. Name conditions caused by mutations in transmembrane and cytoskeletal proteins that disrupt vertical and horizontal (lateral) linkages in the RBC membrane.

II. Short notes: **(8 x 10 = 80)**

1. What are the stages, measurement of Iron status and Mitigation of Iron deficiency in blood donors?
2. Compare and contrast the function of the T cell and NK cell.
3. Explain the Sequential activation of the complement system. Schematically represent the mechanization of antibody dependent cell-mediated cytotoxicity (ADCC).
4. Chemiluminescence Immunoassay principle and importance of Leving Jenning chart in TTI screening.
5. Paroxysmal Nocturnal Haemoglobinuria.
6. Explain the significance of the sigmoid shape of the oxygen dissociation curve. Write in detail about the Biochemical and haematological alterations of Red cell during storage.
7. 34-year-old man with hemophilia A is scheduled for tooth extraction. His hematologist recommends increasing the factor (F)VIII coagulant (FVIII:C) activity level to 50% immediately prior to the extraction. The patient weighs 66 kg, and the patient's FVIII level is currently 5%. The patient in the above case history is given an appropriate dose of recombinant FVIII concentrate to increase the FVIII:C level to 50% as recommended; however, despite this, the activated partial thromboplastin time (aPTT) remains prolonged (greater than 70 s), and the activity level remains well below 50%.
   a) What is the dose of recombinant FVIII concentrate that the patient requires to achieve the desired level?
   b) What may be the cause of this poor response to treatment with recombinant FVIII and laboratory testing should be performed to confirm the underlying cause?
   c) What are the recommendations for managing the patient given these circumstances?

8. a) Define Plasticizers.

   b) As a blood center Medical Officer, what are the general specifications and technical specifications as per Director General of Health Services (Technical specifications of blood bags 2018) to procure 350 ml Triple blood bags for your blood center.

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[MD 1025]