

PART I - HEMATOLOGY

Problem 1

a)

Explain how different factors in the blood collection process can affect the test result of PT-INR.

b)

Explain 3 different instrument methodologies (measuring methods) used for automated coagulation testing.

Describe the advantages in using automated coagulation instruments.

c)

The following conditions can lead to coagulation disorders:

- liver disease
- vitamin K deficiency
- disseminated intravascular coagulation (DIC)

Explain how each of these conditions can influence the hemostasis.

Explain how coagulation tests can be used to assess these disorders.

Problem 2

a)

Iron deficiency is a very common nutritional disorder. Iron deficiency anemia can be observed in blood smears as anisocytosis, microcytosis and hypochromasia.

- draw and explain what this will look like in a blood smear
- can anisocytosis, microcytosis and hypochromasia be detected using the Cobas Micros cell counter? If yes, explain how this is possible.
- why will iron deficiency lead to anemia?
- what is the clinical significance of assaying the ferritin and transferrin levels in anemia?

b)

Very low platelet counts may sometimes be caused by platelet aggregation.

Explain

- how and why platelet aggregates can sometimes appear in blood samples.
- what kind of misinterpretations platelet aggregates may lead to when using automated cell counters?
- how to ascertain that a low platelet count is caused by platelet aggregation?
- how to avoid the formation of platelet aggregates.

PART II - IMMUNOHEMATOLOGY

Problem 3

- a) Give an overview of blood group antigens and antibodies in 7 different blood group systems.
Explain, in short, how the production of these antibodies are initiated.
- b) Describe the principle for the direct anti-humanglobulin technique (DAT) and the indirect anti-humanglobulin technique (IAT).
When do you use either of the two techniques in performing analyses in immunohematological work ?
Give examples and explain on what grounds you have made your choices.
- c) Transfusion reactions caused by ABO incompatibility between blood donor and recipient often have a different course than transfusion reactions caused by incompatibility in other blood group systems.
Explain the reason.

Problem 4

Anne, 34 years old, is in her third pregnancy.

When she visited her physician for control in her 8. month of pregnancy, the physician detected an abnormal heart sound of the fetus. The physician decided that the baby is to be delivered by section (Cesarian) the next day.

A blood sample is taken from Anne and the following analyses are performed:

- * ABO-typing
- Rh-typing
- Antibody detection and identification
- 2 units of SAGMAN-blood (red blood cells)
- SAGMAN-blood (red blood cells) and plasma for an possible exchange transfusion as treatment for the newborn child.

- a) The following results are obtained:

ABO-typing:

	A-cells	B-cells	Anti-B	Anti-A
Bloodtype A, control	-	+	-	+
Bloodtype B, control	+	-	+	-
Patient's sample	+	+	-	-

- None visible agglutination
- + Visible agglutination

D-typing:

	Anti-D
Rh + (pos), control	+
Rh – (neg), control	-
Patient's sample	+

- None visible agglutination
- + Visible agglutination

Rh-fenotyping:

	Anti-C	Anti- c	Anti-E	Anti-e
R1R2, control	+	+	+	+
rr, control	-	+	-	+
Patient's sample	+	-	-	+

- None visible agglutination
- + Visible agglutination

Assess these results and determine the ABO-type and the Rh- genotype.

- a)** The laboratory investigation detected an irregular antibody in Anne's plasma.
This antibody was identified as anti-c (in Norwegian: anti- lille c)

We want you to explain by using the attached antigen-chart (ID DiaPanel), how this result is achieved.

- b)** Anne needs 2 units of SAGMAN-blood transfused after the section.
Which laboratory analyses/tests need to be performed before the transfusion can take place ?
State the grounds for your answer.

The physician in charge of treatment decides that the newborn child has to undergo an exchange transfusion immediately (within 2 hours).

For the red blood cells, which ABO-type and Rh-genotype have to be chosen in this case?

For the plasma; which ABO-type must be chosen?

Would you perform a crossmatch?

State the grounds for your answers.



HØGSKOLEN I SØR-TRØNDELAG
AVDELING FOR MAT- OG MEDISINSK
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Kandidatnr:					
Eksamensdato:	17.DESEMBER 2004				
Varighet:	09.00 – 14.00				
Fagnummer:	LO 220H				
Fagnavn:	Medisinsk laboratorieteknologi modul 3				
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Hjelpemidler:	Ingen				
Oppgavesettet består av:	2parts; part I: Hematology and part II: Immunohematology ; 3 pages + 1 attachment				
Attechment:	Antigenchart ID-DiaPanel				
Lykke til!					

NB! 2 problems in hematology weight 50%
2 problems in immunohematology weight 50%