

UNIVERSITETET I OSLO

Det matematisk-naturvitenskapelige fakultet

Exam in: **MBV2020 Laboratory course in biochemistry and molecular biology**

Day of exam: **June 12, 2006**

Exam hours: **14:30-16:30 (2 hours)**

This examination paper consists of **2** pages.

Appendices: **None**

Permitted materials: **None**

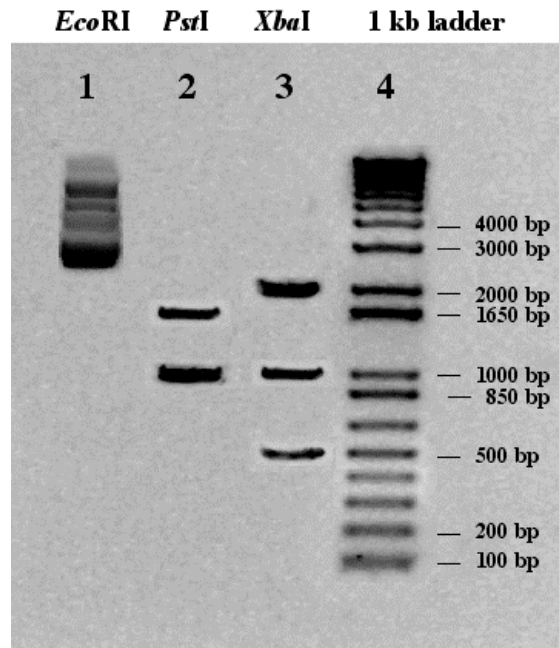
Make sure that your copy of this examination paper is complete before answering.

Numbers in brackets indicate the maximum number of points for each question. The maximum number of points for the entire exam is 30.

1. Try to answer the following questions around electrophoresis:

- a) List the main differences between agarose and polyacrylamide gel electrophoresis.
- b) What is SDS gel electrophoresis used for?
- c) What other type of acrylamide electrophoresis can be run and when is it used?
- d) At what concentrations (in %) are agarose and acrylamide used in electrophoresis?
- e) To which electrode (+ or -) do nucleic acids move in electrophoresis? To which electrode move proteins in SDS gel electrophoresis? (10)

2. A circular plasmid has been digested with the enzymes *EcoRI*, *PstI* and *XbaI* and fragments were run in an agarose gel as shown in the photo below.



Try to answer the following:

- What is the size of the original plasmid?
- Explain the pattern of DNA fragments in lanes 1-3. (10)

3. Try to answer the following questions related to the work in the MBV2020 course:

- What has to be considered when setting up a restriction digestion?
- In which cases will DNA fragments ligate in both orientations into a cut plasmid?
How can the orientation be checked?
- What is an isoschizomer?
- What is a polylinker?
- Why is gel loading buffer added to samples before electrophoresis?
- Why are primer needed in PCR?
- A normal PCR with genomic DNA as template is done in 30 cycles. How many PCR products are synthesized that are longer than the desired product?