



NTNU – Trondheim
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Department of Biology

Examination paper for BI2015 Molecular Biology

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Signature

Question 1 (20%, every sub-question counts 2%)

Explain the following terms in a single sentence:

- a) DH5 α
- b) SDS PAGE
- c) PCR
- d) Isoelectric focusing
- e) Nuclease
- f) pGLO
- g) α helix
- h) Arabinose operon
- i) Lysozyme
- j) TE buffer

Question 2 (30%, a counts 10%, b counts 20%)

- a) Describe two different methods to transform pGReen (with Chloramphenicol resistance marker) into *E.coli* cells and how you detect successful transformation.
- b) Use the attached vector map to calculate the fragment sizes (in bp) generated by digesting the vector pGReen 0029 with the following combinations of restriction enzymes.
Digest 1: HindIII / PSTI
Digest 2: PStI / BSMB1
Digest 3: DRAIII / MSCI / HINDIII

Question 3 (25%, a counts 10%, b counts 15%)

- a) List and explain briefly five characteristics a protein expression vector must have.
- b) Describe the production and purification of a recombinant protein starting with mRNA transcription. Assume you use a GFP tag for purification.

Question 4 (25%, a counts 10%, b counts 15%)

- a) You want to prepare a PCR reaction. What reagents do you need? What are their functions? Suggest a standard PCR program.
- b) You have performed a PCR reaction, but instead of one product several unspecific ones are visible on the gel. Which possibilities do you have to increase the specificity of the reaction?

Vedlegg 1:

