

Minor Exam

BBL231 (Molecular Biology and Genetics)

MM 30

November 9th, 2020

Duration: 1 h

Q. 1.

7

a) What are exonucleases? A sticky end produced by exonuclease digestion from one DNA sequence can be compatible with that from another. Explain.

b) Calculate the number of fragments a given restriction enzyme would be expected to generate from a piece of DNA of given length but unknown sequence. Assume that each base — A, T, G or C — occurs equally frequently in the DNA. Give your answer to the nearest whole number of fragments.

Recognition Sequence: RATNATY

Circular DNA of length: 20 kb

c) Draw the restriction map

EcoR1: 1, 2, and 3 kb

BamHI 2: 2, and 4 kb

EcoR1 and BamHI: 1, 1, 2, and 2 kb

Q. 2 You have isolated a new bacterium which glows in the dark. You would like to identify the gene responsible for that glow. Describe all the steps in detail about identification and isolation of the gene from the bacterium. 5

Q. 3 You are working on an uncharacterized enzyme. You would like to enhance the thermostability of this enzyme. Describe the method you will in this case. 3

Q. 5 What is C value paradox? You would like to clone a gene for cell division from a eukaryote. Describe in detail the method you will use for obtaining the gene. 4

Q. 6 Discuss the applications of Restriction enzymes in DNA Fingerprinting. 3

Q. Describe the Cot curves shown below. Define Cot_{1/2}. Calculate Cot_{1/2} values in the curves shown below. Calculate the complexity of the genome, considering the genome size of *E. coli* to be 4.6 Mbp. Where are the satellite DNAs likely to be located in the curve. What are the various types of satellite DNAs? 8

