Matching 2pts each: Indicate which term/concept in the table on the right best fills in the BLANK in each of the statements by placing the LETTER representing each term/concept in the blank in the sentence.

Please note:
There is one best term/concept for each BLANK.
A term/concept can only be used once (except for #6, where the same word goes in both blanks).

1. Forensic analysis often uses minisatellite DNA, also known as _L_, as genetic markers to determine whether a suspect's DNA matches samples from a crime scene.

2. PCR primers are DNA _H_ that hybridize to DNA sequences which flank the region of DNA to be amplified.

3. Because RFLPs are _A_ genetic markers, both alleles can be detected in a heterozygous individual.

4. If you digest the molecule shown below with the enzyme EcoRI (E) and run it on a DNA gel, you will detect two _P_.

   ![DNA molecule](image)

   E

5. _S_ are illustrated by the example below.

   allele A1
   AGCTCTAGCGCTAT
   TCGAGATCGCGATA

   allele A2
   AGCCCTAGCGCTAT
   TCGGGATCGCGATA

6. A gene is a genetic _F_ but a genetic _F_ is not necessarily a gene (same word in both blanks).

7. RFLPs, SSRPs, SNPs, and VNTRs are _C_ that can be used in genetic mapping experiments.

8. A _G_ genetic locus is not useful in genetic mapping experiments.

9. _E_ of a probe to the membrane in a Southern blot experiment is due to base pairing between the probe and single stranded DNA on the membrane.

10. _J_ is used to detect subtle differences in the number of simple sequence repeats present at microsatellite loci.
21. (10 Points) Snake venom phosphodiesterase was used to digest the DNA shown in the diagram below. Assume that the alpha phosphate group was radioactive on all the deoxyadenosine triphosphates at the time these polynucleotide chains were synthesized. Use this figure to answer the following questions.

a) (2 Points) Label the 3' and 5' ends of both DNA chains.

b) (4 Points) Which nucleoside monophosphates will be radioactive after digestion with snake venom phosphodiesterase? Indicate the identity of the nucleoside monophosphates using the number indicated in the figure (1 through 12).

1) 2) 3) 4) 5) 6) 7) 8) 9) 10) 11) 12)

b) (4 Points) Based on your answer in (b), which dinucleotides were detected in this experiment?

CA, AA, GA

Same grading as part b)
24. (10 Points) A DNA molecule is cleaved with PstI, SalI, or the two enzymes together and then analyzed by gel electrophoresis. The results are shown below.

<table>
<thead>
<tr>
<th>Marker</th>
<th>PstI only</th>
<th>SalI only</th>
<th>PstI and SalI</th>
<th>Marker</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
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</tbody>
</table>

Draw one possible restriction map of this DNA molecule showing the relative positions of the SalI and PstI restriction sites.

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PstI alone

SalI alone

10 = correct
S = effort
0 = little effort
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25. The figure below shows the restriction maps of three common alleles (A1, A2 and A3) of a particular locus on a human chromosome. Southern blot analysis was performed on genomic DNA from a sample of people using the probe indicated by the dark rectangle on the restriction maps.

(8 points) Use the Gel below to draw the results of the Southern blot analysis for each genotype shown below.

b) (2 Points) Is the probe indicated above the best probe for this analysis (yes or no?). If no, explain why (keep it short and simple).