|  |  |  |
| --- | --- | --- |
|  | CENTURION UNIVERSITY OF TECHNOLOGY & MANAGEMENT  M.S. Swaminathan School of Agriculture, Paralakhemundi  MAJOR SUBJECT: Molecular Breeding and Bioinformatics  Course No.: MGPB 0506  Registration No.................................. TOTAL MARKS: ------- |  |
| 1. | RFLP markers were first used in construction of genetic maps by |  |
| a) | Bostein | Yes |
| b) | Vos |  |
| c) | Litt and luty |  |
| d) | Edwards et al. |  |
| 2. | RAPD is |  |
| a) | Sequenced based marker |  |
| b) | Restriction digestion based markers |  |
| c) | PCR based markers | Yes |
| d) | All of the above |  |
| 3. | A set of DNA generated by using random primer in PCR reaction is called |  |
| a) | RAPD | Yes |
| b) | RFLP |  |
| c) | SSR |  |
| d) | All of the above |  |
| 4. | short double stranded DNA sequences with sticky end are ligated to the digested fragments in AFLP is |  |
| a) | Ligase |  |
| b) | Restriction enzyme |  |
| c) | Adaptor | Yes |
| d) | Primers |  |
| 5. | The codominant markers located on either side of the target gene can be used to select for rare recombinants |  |
| a) | Background selection |  |
| b) | Forground selection |  |
| c) | Recombinant selection | Yes |
| d) | None of the above |  |
| 6. | Which of the following are not the advantages of MAS |  |
| a) | MAS can be done in the seedling stage |  |
| b) | MAS can accelerate recovery of the recurrent parent genotype |  |
| c) | Cannot eliminate linkage drag | Yes |
| d) | MAS allows gene pyramiding as well as trait stacking. |  |
| 7. | The ability of a marker to differentiate homozygous from heterozygote known as |  |
| a) | Dominant marker |  |
| b) | Codominant marker | Yes |
| c) | Hybridization based marker |  |
| d) | PCR based marker |  |
| 8. | All the statements are true regarding RAPD and RFLP except |  |
| a) | RAPD is a quick method as compare to RFLP |  |
| b) | Radioactive probes are not required in RAPD | Yes |
| c) | Species specific primers are required in RAPD |  |
| d) | RFLP is more reliable than RAPD |  |
| 9. | Selection of the double recombinant in MAS can be obtained in which genetarion |  |
| a) | BC1 |  |
| b) | BC2 | Yes |
| c) | BC6 |  |
| d) | BC10 |  |
| 10. | Marker present within gene of interest known as |  |
| a) | Functional marker |  |
| b) | Indirect marker |  |
| c) | Direct marker |  |
| d) | Both a and c | Yes |
| 11. | Changes in restriction enzyme sites can be used as polymorphic markers. |  |
| a) | True | Yes |
| b) | False |  |
| c) | Maybe |  |
| d) | I don’t know |  |
| 12. | Which of the following are the dominant markers |  |
| a) | SSR |  |
| b) | RFLP |  |
| c) | SNP |  |
| d) | None of the above | Yes |
| 13. | Why might use of microsatellites in genetic mapping studies be an advantage over RFLPs? |  |
| a) | Microsatellites are easier to detect. |  |
| b) | Microsatellites are more abundant than RFLPs. |  |
| c) | Microsatellites have more potential alleles than RFLPs. |  |
| d) | All of these. | Yes |
| 14. | Which is possible reasons to explain the low impact of MAS in crop improvement |  |
| a) | QTL effects may depend on genetic background or be influenced by environmental conditions |  |
| b) | Poor integration of molecular genetics and conventional breeding |  |
| c) | Accuracy of QTL mapping studies |  |
| d) | All of the above | Yes |
| 15. | Which of the following is the best marker |  |
| a) | Morphological marker |  |
| b) | Biochemical marker |  |
| c) | Molecular marker | Yes |
| d) | Cytological marker |  |
| 16. | A combination of MAS with phenotypic screening/selection known as |  |
| a) | Marker assisted backcrossing |  |
| b) | Gene Pyramiding |  |
| c) | Early generation selection |  |
| d) | ‘Combined’ approaches | Yes |
| 17. | The recombination rate between marker and target trait is |  |
| a) | 0 | Yes |
| b) | >1% |  |
| c) | <1% |  |
| d) | =1% |  |
| 18. | AFLP is |  |
| a) | PCR based method |  |
| b) | Method to detect polymorphism in DNA throughout the genome |  |
| c) | Detect presence absence of fragment |  |
| d) | All of the above | Yes |
| 19. | Linkage drag can be removed by |  |
| a) | Backcrossing |  |
| b) | Diallele Selective mating |  |
| c) | Marker assisted selection |  |
| d) | All of the above | Yes |
| 20. | RAPD discover by |  |
| a) | Williams | Yes |
| b) | Watson |  |
| c) | Wolf |  |
| d) | Willson |  |
| 21. | The concept of Gene Pyramiding given by |  |
| a) | Wilkinson |  |
| b) | John |  |
| c) | Hussen |  |
| d) | Nelson | Yes |
| 22. | The term MAS is given by |  |
| a) | Golden |  |
| b) | Beckmann and Soller | Yes |
| c) | Fisher |  |
| d) | Maclan |  |
| 23. | ISSR marker denotes |  |
| a) | Interstitial Simple Sequence Repeat |  |
| b) | Intra Simple Sequence Repeat |  |
| c) | InterSimple Sequence Repeat | Yes |
| d) | Initial Simple Sequence Repeat |  |
| 24. | Which of the following is tetra cutter |  |
| a) | MseI |  |
| b) | EcoRI |  |
| c) | EcoRII |  |
| d) | MseII |  |
| 25. | Marker genotype data can be used for |  |
| a) | Cultivar identity |  |
| b) | Assess the genetic diversity present in germplasm collections |  |
| c) | Confirm the hybrid status of the F1 seed |  |
| d) | All the above | Yes |

|  |  |  |
| --- | --- | --- |
| 26. | Which of these genetic markers is most likely to be highly polymorphic (have many different alleles)? |  |
| a) | An RFLP |  |
| b) | A microsatellite |  |
| c) | An SNP | Yes |
| d) | All of these are equally polymorphic |  |
| 27. | Addition of one selective base in primers can reduced down the nonspecific bases to |  |
| a) | 2 fold |  |
| b) | 16 fold | Yes |
| c) | 10 fold |  |
| d) | 5 fold |  |
| 28. | Multi trait introgression in the same background is known as |  |
| a) | Marker assisted backcrossing |  |
| b) | Gene Pyramiding | Yes |
| c) | Early generation selection |  |
| d) | ‘Combined’ approaches |  |
| 29. | Non-radioactive stains used in RFLP |  |
| a) | Radioactive isotope |  |
| b) | Fluorescein |  |
| c) | Digoxigenin |  |
| d) | Both b and c | Yes |
| 30. | Which of these statements regarding RFLP analysis is correct? |  |
| a) | RFLP analysis requires Southern blotting for detection of fragments |  |
| b) | RFLPs can identify single base pair changes at any site in the chromosome |  |
| c) | An RFLP typically produces several different alleles |  |
| d) | All of these are correct | Yes |
| 31. | The size of the probe used in RFLP |  |
| a) | 0.5-0.3bp |  |
| b) | 0.5– 3.0 kb | Yes |
| c) | 0.5-3bp |  |
| d) | 0.5-0.3kb |  |
| 32. | Sequence characterized amplified region (SCAR) marker developed from |  |
| a) | RFLP |  |
| b) | RAPD | Yes |
| c) | SSR |  |
| d) | None of the above |  |
| 33. | What is the use of a molecular marker? |  |
| a) | Identification of duplicates allelic diversity at inter varietal level |  |
| b) | Identification duplicate accessions |  |
| c) | Elimination of duplicate accessions |  |
| d) | All of the above | Yes |
| 34. | RFLPs are inherited in a simple Mendelian fashion and display codominance |  |
| a) | True | Yes |
| b) | False |  |
| c) | Maybe |  |
| d) | I don’t know |  |
| 35. | Identification of a new gene from the phenotype of plant known as |  |
| a) | Reverse genetics |  |
| b) | Forward biology |  |
| c) | Forward genetics | Yes |
| d) | Reverse biology |  |
| 36. | Marker-assisted backcrossing helpful in |  |
| a) | Effective selection of target loci |  |
| b) | Minimize linkage drag |  |
| c) | Accelerated recovery of recurrent parent |  |
| d) | All of the above | Yes |
| 37. | A monomorphic DNA segment is: |  |
| a) | A segment of DNA that exists in many forms in the population |  |
| b) | The most common variation of a gene or marker sequence | Yes |
| c) | A segment of DNA shared by over 99% of the population |  |
| d) | A segment of DNA that controls a single gene function |  |
| 38. | What is marker aided selection |  |
| a) | Selection of a genotype which carry desirable gene via linked marker |  |
| b) | Prevents linkage drag |  |
| c) | Requires mapping population |  |
| d) | All of the above | Yes |
| 39. | Variation in the allele among the population is created through |  |
| a) | Mutation |  |
| b) | Hybridization |  |
| c) | Polyploidy |  |
| d) | All of the above | Yes |
| 40. | Which of the following would be a reasonable use of an RFLP map? |  |
| a) | Identification of the exact location of an unknown gene along the chromosome |  |
| b) | Description of the size of DNA fragment required to clone the region containing an unknown gene |  |
| c) | Identification of the region in which an unknown gene is located |  |
| d) | All of these | Yes |