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| **Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)** | | | | | | |
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| **Fifth Semester B.E. Degree Examination**  **GENETIC ENGINEERING & APPLICATIONs** | | | | | | |
| **TIME: 03 Hours** | | |  | **Max. Marks: 100** | | |
| Note: | 1. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**. | | | | | |

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| **Module – 1** | | |  |
| **Q.1** | **(a)** | A gene encoding for a novel protein needs to be expressed in *E.coli* strain *DH5α*. Develop rDNA process for this objective and explain how do you select positive recombinants? | 10 |
| **(b)** | . “DNA Ligases are valuable tools in genetic engineering”. Justify | 10 |
| **OR** | | |  |
| **Q.2** | **(a)** | Distinguish endonucleases and exonucleases with reference to their applications in genetic engineering. Elaborate on the action mechanism and importance of Restriction endonucleases in GE. | 10 |
| **(b)** | Human CFTR gene is 250KB. Choose an ideal vector to clone this gene and also describe the construction and screening principles of that vector | 10 |
| **Module – 2** | | |  |
| **Q.3** | **(a)** | Differentiate between the cDNA and genomic DNA libraries. | 10 |
| **(b)** | A patient is suspected with a retroviral infection. Select and explain a suitable molecular diagnosis method to confirm the infection and also to know the progression of infection? | 10 |
| **OR** | | |  |
| **Q.4** | **(a)** | Examine the roles of detergents, chloroform, sodium salts, EDTA and isopropyl alcohol in nucleic acid isolations. | 10 |
| **(b)** | Apply a non-PCR technique to detect the presence of a ‘gene X’ in a given genome. | 10 |
| **Module – 3** | | |  |
| **Q.5** | **(a)** | *“Agrobacterium* species is termed as nature’s genetic engineer”. Justify | 10 |

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|  | **(b)** | For years Cotton farming suffered because of Bollworm and other Coleopteran insects. How did transgenic science help in solving this problem? | 10 |
| **OR** | | |  |
| **Q.6** | **(a)** | Weeds compete with crops for nutrients, light and space. Suggest transgenic approaches to solve this problem. | 10 |
| **(b)** | What is transfection? Compare microinjection and retroviral infection methods | 10 |
| **Module – 4** | | |  |
| **Q.7** | **(a)** | Evaluate the efficiencies and deficiencies of RFLP, RAPD and SNP markers in MAS. | 10 |
| **(b)** | Distinguish between biotic and abiotic stresses to the crops. Discuss few examples wherein transgenic techniques were applied to offer abiotic stress tolerance. | 10 |
| **OR** | | |  |
| **Q.8** | **(a)** | “Biopharming offers to exploit animals as bioreactors”. Justify the statement with relevant examples. | 10 |
| **(b)** | Distinguish between Physical mapping and Genetic Mapping. Explain the common physical mapping techniques. | 10 |
| **Module – 5** | | |  |
| **Q.9** | **(a)** | Explain *invivo* and *exvivo* gene therapy with examples. | 10 |
| **(b)** | A given gene needs to silence through a post transcriptional silencing approach. Suggest a suitable technique to achieve this objective. | 10 |
| **OR** | | |  |
| **Q.10** | **(a)** | Elucidate the recombinant DNA steps in heterologous expression of Insulin. | 10 |
| **(b)** | Describe the Challenges & future of gene therapy | 10 |
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| **Table showing the Bloom’s Taxonomy Level, Course Outcome and Programme Outcome** | | | | | | | |
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| **Question** | | | **Bloom’s Taxonomy Level attached** | | **Course Outcome** | **Programme Outcome** | |
| **Q.1** | (a) | | 2,3 | | 1 | 1,3 | |
| (b) | | 4 | | 1 | 1 | |
| **Q.2** | (a) | | 2,3 | | 1 | 1 | |
| (b) | | 4 | | 1 | 1 | |
| **Q.3** | (a) | | 4 | | 2 | 1 | |
| (b) | | 2,3 | | 2 | 1,2 | |
| **Q.4** | (a) | | 4 | | 2 | 1,4 | |
| (b) | | 2,3 | | 2 | 1,3 | |
| **Q.5** | (a) | | 4 | | 3 | 1 | |
| (b) | | 2,3 | | 3 | 1,3 | |
| **Q.6** | (a) | | 2,3 | | 3 | 1,3 | |
| (b) | | 4 | | 3 | 1 | |
| **Q.7** | (a) | | 4 | | 3 | 1 | |
| (b) | | 3,4 | | 3 | 1,3 | |
| **Q.8** | (a) | | 2,3 | | 3 | 1,3 | |
| (b) | | 4 | | 3 | 1 | |
| **Q.9** | (a) | | 2 | | 3 | 1,3 | |
| (b) | | 3 | | 3 | 1,3 | |
| **Q.10** | (a) | | 3 | | 3 | 1,3 | |
| (b) | | 2 | | 3 | 4 | |
|  | | | | | | | |
| **Bloom’s Taxonomy Levels** | | **Lower order thinking skills** | | | | | |
| Remembering(  knowledge):𝐿1 | | Understanding  Comprehension): 𝐿2 | | | Applying (Application):  𝐿3 |
| **Higher order thinking skills** | | | | | |
| Analyzing (Analysis): 𝐿4 | | Valuating (Evaluation): 𝐿5 | | | Creating (Synthesis): 𝐿6 |
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Related image