Extra

3 Hours

Total Marks: 100

1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labeled diagrams wherever necessary.
4. Use of log tables and non-programmable calculators is allowed.

Q.1A. **Select the correct alternative: (Any six)** 06

1 _____plasmid of Agrobacterium tumefaciens is responsible for causing crown gall disease.
a. Ti plasmid b. Tr plasmid c.To plasmid d.Ts plasmid

2 Name the gene which is oncogenic in nature and is present in T-DNA.
a. NPT II gene b. rolA gene c. aux gene d. vir gene

3 Particle bombardment is otherwise called as _____.
a. Microinjection b. Electroporation
c. Gene gun methods d.Agrobacterium-mediated transfer

4 Temporary bridge between *Agrobacterium* and plant cell is created by the protein coded by _____ gene.
a. virA b. virB c.virC d. virD

5 Biolistic (Gene gun) method is suitable for _____.
a. Only dicot plants b. Only monocot plants
c. Both monocot and dicot plants d. Bacterial transformation

6 _____ was the first plant developed using protoplast fusion.
a. Rice b. Tobacco c. Millet d. Sorghum

7 Which Vir gene product helps to strip off the protein from the T-DNA–protein complex before integration of T-DNA into the nuclear genome?
a. VirA b. VirB c. VirC d. VirD2

8 The amino acids lysine, threonine, methionine, and isoleucine are all derived from _____.
a. Shikimate pathway b. Aspartate family pathway
c. Pyruvate family pathway d.Aromatic amino acid pathway

9 Polylinker sites are also called _____.
a. Origin of replication b. Multiple cloning site (MCS)
c. Promoter region d. Selectable marker

Q.1 B. **Answer the following questions: (Any Two)** **14**

1. Describe the mechanism of transfer of T-DNA in plants.
2. Explain the microprojectile method for gene delivery in plant cells
3. Explain how seed protein quality can be improved in crops with examples.

Q.2A. **Select the correct Alternative: : (Any six)** **06**

1. During the DNA microinjection method, a superovulated mouse produces about _____ eggs.
   a. 1 b. 5 c. 10 d. More than 35

2. DNA is microinjected into the _____ pronucleus of a fertilized egg.
   a. Male pronucleus b.Female pronucleus
   c. Both pronuclei d. Cytoplasm

3. _____ is the method in which transfected embryonic stem (ES) cells are microinjected into a blastocyst for the production of transgenic mice.
   a. Pronuclear injection method b. Somatic cell nuclear transfer
   c. Embryonic stem cell-mediated method d. Particle bombardment method

4. In the Negative Selection method, cells that express _____ convert ganciclovir to toxic compounds and get negatively selected.
   a. Thymidine kinase b.NPT II gene c. GFP gene d.rol gene

5. In cloning sheep by nuclear transfer method, G0 quiescent state refers to _____ state.
   a. Actively dividing b. Non-dividing c.Apoptotic d.Senescent

6. Sheep Dolly was cloned by transfer of a nucleus from a _____ cell of an adult sheep into an enucleated egg cell.
   a. Mammary b. Muscle cell c.Blood cell d.Nerve cell

7. In transgenic fish, the GFP gene codes for which protein?
   a. Green fluorescent protein b. Growth factor protein
   c. Globin protein d. Glucagon protein

8. During transgenesis of fish, linearized transgene DNA is microinjected into the _____ of the fertilized egg.
   a.Cytoplasm b.Male pronucleus c.Female pronucleus d. Both pronuclei

9. Transgenic medaka fish have been developed as biosensors to detect natural and synthetic _____ in the aquatic environment.
   a. Estrogens b.Pollens c. Viruses d.Nutrients

Q.2B. Answer the following questions: (Any Two) 15

1. Discuss the retroviral vector method used for the production of transgenic mice. 7
2. Cloning livestock by nuclear transfer method.
3. Explain the concepts of positive and negative selection in the generation of transgenic mice.

Q.3A. Do as instructed: (Any Six) 06

1. ……,. DNA in YAC does not code for any protein but serves as a border of chromosomes.
   a.Centromeric b.Telomeric c. Metacentric d.Acrocentric
2. The insert size of BAC is ……..
   a.150 - 250 kb b.150 - 350 kb c. 250 - 350 kb d. 350 - 450 kb
3. pUC 18 and pUC 19are same vectors but their ……..are inserted in opposite orientation.
   a. Markers b.Resistant genes c.mcs d.ori
4. In the blue white selection procedure, cells are grown on……and ampicillin contains medium.
   a. IPTG b.X- gal c.IPTG and X- gal d. X- gal and tetracycline
5. Cosmid vectors are plasmids with a ……site.
   a. Cos b.Causing c. Phage d.Common
6. HART is a means of identifying recombinant DNA clones by their ability to…….
   a.Base pair b.Hybridize c.Identify d.Cleave
7. In HRT, the mRNA of interest bonds to the…….
   a.DNA b.single stranded DNA c.Double stranded DNA d. cDNA
8. The initial cloned DNA fragment is used to begin the walk that can clone upto..,.....
   a.20 kb b.30 kb c.40 kb d.50 kb
9. ……..is used to bypass regions that are difficult to clone.
   a. Chromosome walking b.Chromosome jumping
   c.Chromosome fragmenting d.Chromosome integrating

Q.3 B. **Answer the following: (Any Two)** 14

1. Give an account on cloning vectors plasmids.
2. Explain any 2 methods of recombinant selection and screening
3. Describe the construction of cDNA library.

Q.4A. **Do as directed: (Any six)** 06

1. In Maxam and Gilbert DNA sequencing, the DNA end label is done by using…….
   a.32P-dATP b. 32P-dTTP c. 32P-dGTP d.32P-dCTP
2. In Sanger's DNA sequencing, the normal precursors are labelled radioactivity with……
   a. 32P b.33P c.35S d.All the above
3. In Sanger's DNA sequencing, chain Termination is caused due to……. in 3' position of dideoxy nucleotide.
   a.OH b.H c.Phosphate group d.Methyl
4. ……DNA sequencing is based on the Sanger's- Coulson method.
   a.Maxam and Gilbert b.Sanger's c.Automated d.Pyrosequencing
5. …… is a DNA sequencing method which relies on detection of pyrophosphate release and……..
   a.Generation of light b.Phosphorylation
   c.Methylation d. Dephosphorylation
6. ZNFs are artificial restriction enzymes generated by fusing zinc finger DNA binding domain to a DNA ……..
   a.Restricted domain b.Cleaved domain
   c.Ligated domain d.Fused domain
7. CRISPR sequence is derived from……. DNA that had previously been infected the prokaryotes.
   a.Human b.Mammal c.Bacterial d.Bacteriophage
8. ZNFs are also used to create a new generation of genetic disease model called…….disease model.
   a.Isogenic b.Human c.Exogenic human d.Isogenic human
9. Transactivating CRISPR RNA that base pairs with the cr RNA to form a functional……..RNA.
   a) Complementary b) Template c) Guide d) double stranded

Q.4B.	**Answer the following questions: (Any Two)**	**14**
1.	Give an account on Maxam and Gilbert method of DNA sequencing.	
2.	Explain the automated method of DNA sequencing.	
3.	Narrate the human genome mapping with its applications.	

Q.5	**Write Short notes on the following (Any four)**	**20**
a.	Liposome mediated gene transfer.	
b.	Transgenic Fish	
c.	Protoplast fusion method for gene transfer.	
d.	Isolation of gene of interest	
e.	Chromosome jumping	
f.	CRIPR/cas 9	
