7-4-25

Paper / Subject Code: 86406 / Genetic engineering and Gene editing (Rev.)

TYBT- Liab

2 Hours 30 minutes Total Marks: 75

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

Q.1 Select the correct alternative: (Any Fifteen) 15

1 _____ species of Agrobacterium cause crown gall disease.
   a) *Agrobacterium rhizogenes*
   b) *Agrobacterium tumefaciens*
   c) *Agrobacterium vitis*
   d) *Agrobacterium radiobacter*

2 Which method is used as a biological plant transformation method among the following?
   a) Electroporation
   b) Particle bombardment
   c) Agrobacterium mediated transformation
   d) Liposome mediated transformation

3 The most common vectors for plants are_____.
   a) Sv4O vector and Bovine papillioma vector
   b) Cauliflower mosaic vector and Gemini vector
   c) Lambda phage and M13phage
   d) T4 phage vector

4 Biolistic (gene gun) is suitable for_____
   a) Introducing rDNA into plant cells
   b) Introducing rDNA into animal cells
   c) Disarming the pathogen vectors
   d) DNA fingerprinting

5 In Ti plasmid Vir region, Vir stands for_____.
   a) Variability
   b) Virulence
   c) Variance
   d) Versatile

6 In transgenic Mice Methodology, the foster mother is made pseudopregnant by mating with _____ male.
   a) super fertile
   b) fertile
   c) vasectomized
   d) less fertile

7 A wide variety of polychlorinated biphenyls also have ____ activity in animals.
   a) Oxytocin
   b) Estrogenic
   c) growth hormones
   d) Antidiuretic

8 Transgenic medaka fish have been developed as biosensors to detect natural and synthetic_____ in aquatic environments.
   a) Estrogens
   b) Progesterone
   c) Sulphur
   d) Hydrogen

9 State the full form for YACs used as vectors for animal cells.
a) Yeast Artificial Chromosomes
b) Yeast artifact Chromosomes
c) Yeast Applied Chromosomes
d) Yeast Ancient Chromosomes

10 One of the aims of targeted gene disruption (gene knockout) is to determine the development and physiological consequences of _____ a particular gene.
a) Inactivation
b) Variability
c) Electroporation
d) Transformation

11 The media used to isolate host cells containing pUC vector is _____.
a) NA + amp + IPTG
b) NA + amp + X-Gal
c) NA + amp+ IPTG +X-Gal
d) NA + amp + Y-Gal

12 The procedure in which the denatured cDNA added directly to the mRNA sample is _____.
a) HRT
b) HART
c) HURT
d) HTR

13 Synthetic short strands of double stranded DNA which have a blunt end and a staggered end is called _____.
a) Linker
b) Tail
c) Adaptor
d) probe

14 Modification at restriction sites is carried out by _____.
a) ethyltransferase
b) methyltransferase
c) methylase
d) hydroxymethylase

15 In Southern blotting, the specificity of the test lies in selection of _____.
a) source DNA
b) radioisotope
c) appropriate probe
d) all three

16 _____ is the first method of DNA sequencing.
a) Maxam and Gilbert
b) Sanger's dideoxy
c) Automated
d) Pyrosequencing

17 In Sanger's DNA sequencing, the normal precursors are labelled radioactivity with _____.
a) ^{32}P
b) ^{33}P
c) ^{35}S
d) All the above

18 The 5' to 3' DNA sequence of an autoradiogram is read from _____.
   a) Top to bottom
   b) Bottom to top
   c) Horizontally
   d) None of the above

19 Pyrosequencing is the DNA sequencing method that relies on detection of pyrophosphate release and _____.
   a) Generation of light
   b) Phosphorylation
   c) Methylation
   d) De phosphorylation

20 In TALENs, the DNA binding domain contains 2 divergent amino acids at ____ positions.
   a) 10th and 12th
   b) 11th and 12th
   c) 12th and 13th
   d) 13th and 14th

Q2A)	Illustrate the use of a cointegrated vector system using diagrammatic representation.	8
Q2B)	Discuss in detail the improvement of seed quality protein.	7
	OR	
Q2C)	Explain liposome and protoplast fusion methods for plant transgenesis.	8
Q2D)	Explain Ti plasmid derived vector system.	7
Q3A)	Explain the cloning of livestock by nuclear transfer method.	8
Q3B)	Discuss the regulatory mutation in lacI gene.	7
	OR	
Q3C)	Discuss the embryonic stem cell methodology for the production of transgenic mice.	8
Q3D)	Describe production, methodology and applications of transgenic fish.	7
Q4A)	Explain HRT to identify the translational product of a cloned gene with a diagram.	8
Q4B)	Diagrammatically explain Southern Blotting.	7
	OR	
Q4C)	Elaborate on Restriction Endonucleases Type II.	8
Q4D)	How will you use pUC as a cloning vector?	7
Q5A)	Give an account on Maxam and Gilbert method of DNA sequencing.	8
Q5B)	What is Pyrosequencing? Give a detailed note on pyrosequencing.	7
	OR	
Q5C)	Elaborate the construction of physical maps with examples.	8
Q5D)	What is RNA interference? Explain the working and applications of RNAi.	7