

Please check whether you have got the right question paper.

- N.B:
1. Attempt **all** questions.
  2. All **questions** carry **equal marks**.
  3. **Draw** neat labelled **diagrams** wherever necessary.

**Q.1 a. Do as directed ( any three ):-**

- i. \_\_\_\_\_ enzyme is used for digestion of  $\beta$  –globin gene in a sickle cell trait.
- ii. Taq polymerase extracted from \_\_\_\_\_ organism is used in PCR.
- iii. What is the difference between dNTP and ddNTP?
- iv. State any two strategies used for insertion of DNA into the host cell for genetic immunization.
- v. Explain the term – Peptide vaccine.
- vi. State any two advantages of Vaccinia virus as a vector for vaccine preparation.

03

**b. Attempt the following (any two):-**

- i. Comment: DNA fingerprinting has many applications.
- ii. Discuss steps involved in PCR cycle.
- iii. Explain the preparation of vaccine against FMDV.
- iv. Schematically explain the preparation of subunit vaccine against HSV.

12

**Q.2 a. Give an example of the following ( any three ):-**

- i. *Agrobacterium* species
- ii. Plant growth regulators
- iii. Types of pTi
- iv. Reporter genes
- v. Plants used for preparation of edible vaccines
- vi. Transgenes incorporated in normal rice to produce Golden rice

03

**b. Answer the following ( any two ):-**

- i. Discuss edible vaccines with a suitable example.
- ii. Describe the transfer of T-DNA in plants.
- iii. Give an account of 'Electroporation as a method of producing transgenic plants'.
- iv. What is the mode of action of Cry protein?

12

**Q.3 a. Define the following (any three ):-**

- i. Stem cell
- ii. Superovulation
- iii. Quiescent epithelial cell
- iv. Lox site
- v. Antifreeze protein
- vi. Cloning

03

**b. Give an account of the following ( any two ):-**

- i. Transgenic fish as a means to improve fish aquaculture.
- ii. Production of transgenic mice by DNA microinjection.
- iii. Cre – loxP system for regulating transgene expression.
- iv. Applications of transgenic animals.

12

**Q.4 a.** Explain the following terms (**any three**):-

- i. EMBL
- ii. URL
- iii. Home page
- iv. PIR
- v. ENTREZ
- vi. HTML

03

**b.** Answer the following (**any two**):-

- i. Discuss the scope and application of Bioinformatics.
- ii. Define sequence similarity searching. Describe the tools used in similarity searching.
- iii. Give an account of role of computers in Bioinformatics.
- iv. What is WWW? Explain its importance in Bioinformatics.

12

**Q.5** Write short notes on (**any three**):-

- a) Diagnosis of sickle cell anemia using RFLP
- b) Liposome mediated gene transfer
- c) qPCR
- d) pTi derived vector system
- e) Any one test to ensure the site specific integration of a target gene
- f) Web search tools

15