

- a) Molecular build up at nucleotides
- b) Molecular degradation to DNA break up
- c) Molecular cement for combining DNA
- d) Molecular scalpels for cutting DNA

viii) What will be the consequence of not having an origin of replication (ori) in the vector?

- a) If an ori is absent, replication of vector would not take place
- b) As the cells divide after taking up the vector, both the daughter cells would be having the vector
- c) A colony of transformed colonies is observed
- d) The vector won't be taken up by the cell

ix) The hybridomas are made by _____.

- a) Fusing T cells with myeloma cells
- b) Fusing T helper cells with myeloma cells
- c) Fusing B cells with myeloma cells
- d) Fusing B memory cells with myeloma cells

x) Cell-mediated immunity is carried out by _____ While humoral immunity is mainly carried out by _____

- a) B cells/T cells
- b) Epitopes/Antigens
- c) T cells/B cells
- d) Antibodies/Antigens

xi) Type IV hypersensitivity is also called as _____.

- a) Immediate hypersensitivity
- b) Delayed hypersensitivity
- c) Cytotoxic hypersensitivity
- d) Immune complex hypersensitivity

xii) Which immunoglobulin is responsible for humoral sensitivity and histamine release?

- a) IgE
- b) IgM
- c) IgG
- d) IgA

xiii) _____ technique is used for amplification of RNA molecules

- a) Nested PCR
- b) Real time quantitative PCR
- c) Anchored PCR
- d) Reverse Transcription PCR (RT-PCR)

xiv) The transfer of genetic material from one bacterium to another via virus is called.....

- a) Transformation
- b) Conjugation
- c) Recombination
- d) Transduction

xv) Which of the following characteristics is not true of a plasmid?

- a) It is a circular piece of DNA.
- b) It is required for normal cell function.
- c) It is found in bacteria.
- d) It can be transferred from cell to cell.

xvi) The mutation which will not affect the length of a protein is _____.

- a) Nonsense mutation
- b) Missense mutation
- c) Frame shift mutation
- d) Reverse Mutation

xvii) Which of the following technique is suitable for identifying mRNA molecule in a sample

- a) Western blotting
- b) Southern blotting
- c) Eastern blotting
- d) Northern blotting

xviii) The chemical nature of humulin produced by rDNA technology is

- a) lipid
- b) protein
- c) polysaccharide
- d) nucleic acid

xix) A period during which the growth rate of cells gradually increases is known as _____.

- a) Lag phase
- b) Stationary phase
- c) Log phase
- d) Deceleration phase

xx) It is necessary to have _____ in the nutrient medium for the production of Vitamin B12.

- a) Manganese
- b) Phosphate
- c) Cobalt
- d) Calcium

Q. 2. Long Answers Questions (Answer 2 out of 3) (2 x 10) = 20

- i) Define enzyme immobilization. Elaborate different methods of enzyme immobilization and give their applications.
- ii) Describe the steps involved in r-DNA technology and its application in detail.
- iii) Illustrate immuno-blotting technique? Discuss in detail the different methods of immuno-blotting techniques.

Q. 3. Short Answers Questions (Answer 7 out of 9) (7 x 5) = 35

- i) Define the cloning vector. Explain the different types of cloning vectors.
- ii) Illustrate Hybridoma technology and give the role of HAT medium in monoclonal antibody production.
- iii) State the mutation and comment on different types of mutation.
- iv) Discuss the structure and functions of different types of MHC.
- v) Explain in detail the construction of a typical fermenter with a suitable diagram.
- vi) Define biosensor. Illustrate the components and types of biosensors.

vii) Write a note on PCR technique

viii) Elaborate in detail any four methods of gene transfer along with diagrams.

ix) Compare different types of hypersensitivity reactions.

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