





iii) Intones are present in the DNA of

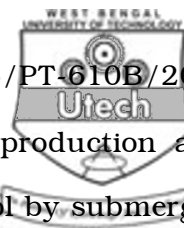
- a) prokaryotes b) eukaryotes
- c) both (a) and (b) d) bacteria.

iv) DNA amplification by the polymerase chain reaction uses

- a) *Thermus aquaticus* DNA polymerase
- b) DNA topoisomerase
- c) RNA polymerase
- d) DNA helicase.

v) Which are enzymes that catalyse addition of nucleoside triphosphate $3'$ – OH terminals of single strands of pre-existing polynucleotide (primers) with release of pyrophosphate ?

- a) Transcriptases b) Polymerases
- c) Map kinases d) None of these.



vi) Micro-organisms used for commercial production and high yield percentage of chloramphenicol by submerged fermentation is

- a) *Streptomyces griseus*
- b) *Streptomyces venezuela*
- c) *Streptomyces aureofaciens*
- d) *Streptomyces kanamyceticus*.

vii) Reverse transcriptase

- a) makes a DNA copy of an RNA molecule
- b) makes an RNA copy of an RNA molecule
- c) makes an RNA copy of a DNA molecule.

viii) Functional genomics deals with

- a) identification of genes and their respective functions
- b) predictions related to functions of proteins
- c) *in vitro* assays and clinical trials
- d) measurement of the levels of gene expression in different tissues.

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- ix) Okazaki fragments are joined with each other by
- a) DNA ligase
 - b) Endonuclease
 - c) DNA gyrase
 - d) Topoisomerase.
- x) The improvement of an industrially useful microbial strain can be achieved through
- a) somanoclonal variation
 - b) genetic recombination
 - c) mutation
 - d) all of these.
- xi) Humulin is
- a) bacterial insulin produced by *E.coli* using *rDNA* technology
 - b) synthetic insulin produced by *rDNA* technology
 - c) human insulin produced by *E.coli* using *rDNA* technology
 - d) human insulin expressed in mammalian cells.

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xii) Which of the following is an ultrasound contrasting agent ?

- a) Carbon nanotube
- b) Perfluorate filled nanosomes
- c) Dendrimers
- d) None of these.

GROUP – B
(Short Answer Type Questions)

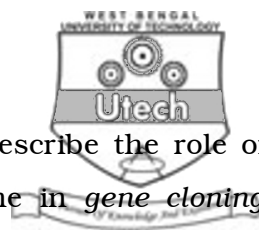
Answer any *three* of the following. $3 \times 5 = 15$

2. Differentiate between cDNA and genomic DNA.

3. Define the following :

- a) Bioinformatics
- b) Biosensor
- c) Biofuels
- d) Biochips
- e) Biofilms.

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4. Why *Taq* polymerase is used in PCR ? Describe the role of *Ampicillin* resistance gene and *Lac Z* gene in *gene cloning* vector.
5. Describe the role of Gene Therapy in the treatment of *Sickle cell anemia*.
6. What are the advantages associated with use of plants as expression system in large scale production of biopharmaceuticals ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

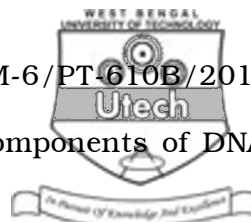
7.
 - a) Write in short the different steps of PCR.
 - b) Mention the advantages, limitations and applications of PCR technology.
 - c) Write a short note on genomic DNA library.

$3 + (2 + 2 + 2) + 6$

8. Differentiate between the following :

- a) Western blot, southern blot and northern blot techniques.
- b) DNA fingerprinting and DNA footprinting.
- c) Expression system and expression vector. $5 + 5 + 5$

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9. Define DNA vaccine. What are the key components of DNA vaccines ? Describe the modes of delivery of DNA vaccine.

What are the advantages of DNA vaccine over other attenuated vaccine/inactive vaccine ? 1 + 3 + 6 + 5

10. What is transgenic animal ? What are the different methods for creating transgenic animals ? What are their applications ? 2 + 8 + 5

11. a) Briefly enumerate the role of nanotechnology in cancer therapy.
- b) Briefly write down the method of commercial production of erythropoietin by rDNA technology.

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