

Topic :- Biotechnology & It's Applications

- 1 **(d)**
Presence of a pathogen (bacteria, viruses, etc.) is usually suspected only when the pathogen has produced a diseased symptom. By that time the number of pathogens is already very high in the body but very low count of a bacteria or virus (when the symptoms of the disease are not yet visible) can be detected by multiplication of their nucleic acid by **PCR**
- 2 **(d)**
Insulin was the first hormone prepared by genetic engineering within the *E. coli* bacterium. Insulin is made up of two 20 and 30 chains of amino acid residues. Two different *E. coli* bacterial cultures were used to produced each of the insulin chain, these were then recovered from the bacterial and separated by β -galactosidase and finally, chemically joined to make human insulin.
- 3 **(a)**
Insulin is the first hormone produced by culturing *E.coli* bacteria, in which insulin producing genes have been transferred from human beings.
- 4 **(d)**
Reporter genes are used to determine a particular DNA construct has been successfully introduced into a cell, organ or tissue. Enhancer is a DNA sequence present within the control regions of many eukaryotic genes that can enhance transcription. A transgenic organism contains in its genome a gene or genes introduced by one or the other technique of transfection. The gene introduced by transfection is called **transgen**. Promoter is a cis-acting nucleotide sequence on a

- DNA molecule, which promotes the initiation of transcriptin.
- 5 **(c)**
Genomic DNA library means packing of donor DNA in a collection of vectors.
 - 6 **(c)**
A probe is radioactively labeled (P^{32}) nucleic acid (20-40 nucleotide long) with a short sequence complementary to at least one part of the desired DNA/gene.
 - 7 **(b)**
A monopoly granted to a person who has either invented a new and useful article, made improvement in an existing article or invented a new process of making an article is called **patent**
 - 8 **(d)**
Agrochemicals are expensive for farmers. In developing countries and also they have harmful effects on the environment. Therefore, genetically modified crops were developed to overcome such problems
 - 9 **(b)**
Biopiracy is defined as the use of bioresources by multinational companies and other organisations without proper authorisation from the countries and concerned people without complementary payment
 - 10 **(a)**
Triticale is a man made cereal obtained by intergeneric cross between bread wheat (*Triticum* = 422) and rye (*Secale* = 14) followed by colchicines treatment.
 - 11 **(c)**
Insulin obtained from the pancreas of cattle and pigs slightly differ from the human insulin in their amino acid sequence. Moreover, the insulin production from pig and cattle is not sufficient to cater the needs of growing number of diabetic patients.
Also, the injection of insulin into the patients,

occasionally produces sensitivity reaction and side effects. These factors led researches to look for some alternative source of human insulin. The search for new source was soon fulfilled by recombinant DNA technology

- 12 **(d)**
T_i –plasmid is found in *Agrobacterium tumefaciens*, which produces crown gall (tumour) in a large number of dicot species. *A. tumefaciens* is a Gram negative soil bacterium that infects a wide range of plants and cause crown galls.
- 13 **(b)**
All option are correct except (ii) new variety of Basmati rice was derived from Indian farmer's varieties
- 14 **(d)**
By using genetic engineering or recombinant DNA technology, insulin producing genes from human beings have been transferred into *E. coli* bacteria, which produced insulin called 'humulin' for clinical use. This type of synthetic insulin was produced by an American pharmaceutical firm Eli Lilly on 5th July 1983.
- 15 **(d)**
Restriction endonucleases are the enzymes, which cut a DNA molecule within certain specific sites that have specific base sequence, e.g., *Hae* III, *Eco* RI, *Bam* II, *Hind* II, *Pst* I, etc. DNase-I is not a restriction endonuclease enzyme. DNA polymerase-III synthesizes DNA, while DNA polymerase-I erases primer and fills gaps during DNA replication.
- 16 **(c)**
The term 'totipotency' refers to the development of an organ from a cell in culture medium.
- 17 **(c)**
Hirudin is an anticoagulant protein found in leech (*Hirudinaria*). It is now produced through genetic engineering from seeds of *Brassica napus*. The gene encoding hirudin was transferred into

Brassica napus, where hirudin accumulated in seeds which is purified and used medicinally.

18 **(b)**
Restriction enzymes cut double stranded DNA molecules at specific sites called recognition site that have specific base sequence. The restriction enzyme *Eco*RI, *Bam*II and *Hind*III are used in recombinant DNA technology to produce cuts in vector and other DNA molecules to obtain chimeric DNA.

19 **(d)**
As a first step towards the gene therapy, lymphocytes a kind of white blood cells, are extracted from the bone marrow of the patient and are grown in a culture outside the body. A functional ADA, cDNA *is then introduced into these lymphocytes, which the reinjected to the patients bone marrow but as these cells do not always remain alive, the patient requires periodic infusion or such genetically engineered lymphocytes*

20 **(b)**
Probe is a defined nucleic acid molecule that can be used in molecular hybridization procedures to identify specific nucleic acid sequences that are complementary to it, by virtue of a label carried by the probe. The label may be radio active or non-radioactive.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	D	D	A	D	C	C	B	D	B	A
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	D	B	D	D	C	C	B	D	B