

Topic :- Biotechnology & It's Applications

- 1 **(d)**
PCR can detect very low amounts of DNA. PCR is now usually used to detect HIV in suspected AIDS patients. It is also used to detect mutations the in genes in suspected cancer patients. It is a good technique to identify many other genetic disorders
- 2 **(b)**
Anther culture is the technique of 'tissue culture' developed by **Guha** and **Maheshwari** (1964). It is the culturing of anthers over suitable culture medium.
- 3 **(d)**
Restriction endonucleases cleave DNA molecules only at specific nucleotide sequence called **restriction sites**. **DNA Ligase** enzyme is used to join bits of DNA.
- 4 **(a)**
Phytotron is a chamber, in which plants can be grown in controlled condition for the study of effect of environmental condition on their growth.
- 5 **(c)**
Pseudomonas Putida is a genetically engineered bacterium with many different plasmids to degrade the pollutants. It is developed by **Dr. Anand Mohan Chakravorty** and is known as superbug or oil eating bug or Chakraborty's superbug. Now-a-days, this genetically engineered bacterium is utilized for cleaning of marine oil slicks.
- 6 **(a)**

RNA interference.

Nematodes is a group of organisms, which parasites a large number of plants and animals including human being. One of the common nematodes *Meloidogyne incognita* infects the roots of tobacco plants and causes a great loss by causing reduction in yield.

This infestation was prevented by using a novel strategy, which was based on the process of RNA interference (RNAi). RNA is powerful reverse genetic tool to study gene function

7 **(c)**

Insulin contains two short polypeptide chains, chain A and B-chain linked by disulphide bridge.

In mammals, insulin is synthesised as prohormone (that needs to be processed to become mature and functional hormone). It contains an extra stretch called-peptide. C-peptide is absent in mature insulin and is removed during the maturation into insulin

9 **(d)**

The enzyme used in PCR is commercially obtained from *Thermus aquaticus*.

10 **(a)**

Genetically engineered microorganism called *Pseudomonas putida* is used in bioremediation of oil spills. It is also known as 'Chakravorty's super bug or oil eating super bug.

11 **(c)**

Vector is used to introduce genes into a host cell, where the genes may be amplified or otherwise manipulated, e.g., *A. tumefaciens*.

12 **(d)**

Plasmid is an extrachromosomal genetic element of DNA that is capable of replicating independently of host chromosome. It forms the basis of many cloning vectors used in genetic engineering.

13 **(a)**

β -carotene is principal source of vitamin-A

generally, seeds of rice do not have vitamin-A but golden rice, which is developed through genetic engineering has the high vitamin-A content

14 (c)

Earlier, insulin was extracted from the pancreas of slaughtered cattle and pigs but some patients began developing allergies. The injection of this insulin into patients occasionally produces sensitivity reaction and side effects

15 (c)

The molecular probes are usually single stranded pieces of DNAs (sometimes RNAs), labelled with radio-isotopes such as P^{32} . Molecular probes are available for many genetic disorders such as, Duchenne muscular dystrophy, cystic fibrosis, Tay-Sachs disease

16 (d)

Biotechnology may be, simply defined as the use of micro-organisms animals or plant's cells, or their components to generate products and services useful to human beings. Now-a-days, biotechnology is very helpful in producing transgenic crops or genetically modified (GM) crops, transgenic animals, biofertilizers, antibodies, hormones like humulin (genetically engineered human insulin), antibodies and various other useful products.

17 (d)

Bt cotton, *Bt* tobacco, *Bt* tomato, etc are transgenic plants having *Bt-2* gene encoding *Bt* toxin, (e.g., thurioside). *Bt* toxin gene has been isolated from a bacterium *Bacillus thuringiensis* therefore, called *Bt* (i.e., *Bacillus thuringiensis*). These plants are resistant for more than 140 species of insects including common cabbage worm, caterpillars, bag worms, canker worms, gypsy worm, etc.

18 (a)

The polymerase chain reaction (PCR) is a technique by which small samples of DNA can be quickly amplified. The repeated amplification is achieved by the use of thermostable DNA

polymerase, *i.e.*, (*Taq*-polymerase isolated from a bacterium, *Thermus aquaticus*) which remain active during the high temperature induced denaturation of double-stranded DNA.

19 **(b)**
Transgenic animals are those, which have foreign DNA in all of its cells

20 **(d)**
The application of biotechnology includes
(i) therapeutics
(ii) diagnostics
(iii) genetically modified crops for agriculture
(iv) processed food
(v) bioremediation
(vi) waste treatment and
(vii) energy production

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