

**Topic :- Biotechnology & It's Applications**

- 1 **(b)**  
Insulin
- 2 **(d)**  
*Bt* cotton is not resistant to all pesticides
- 3 **(b)**  
**Biowar or biological war or bioterrorism** is the development of biological weapons against people, their crops and animals.
- 4 **(d)**  
The technique of fingerprinting was initially developed by **Alec Jeffreys**. He used a satellite DNA as probe that shows very high degree of polymorphisms. It was called as Variable Number of Tandem Repeats (VNTR).
- 5 **(b)**  
ADA – Adenosine Deaminase
- 6 **(d)**  
Professor **F C Steward** of Cornell University (USA) demonstrated that mature cells removed from a carrot and placed in a suitable culture solution could be stimulated to start dividing again and to provide new carrot plants (totipotency). Totipotency is inherent capability of a single cell, which provides the genetic programme required to direct the development of an entire individual.
- 7 **(a)**  
**Golden rice** is transgenic rice having carotene and iron. Carotene is precursor of vitamin-A *Flavr savr* (transgenic tomato) remains fresh and retain their flavor much longer than normal tomato. *Bt brinjal* is insect resistance brinjal.

- 8 **(c)**  
Both statements are corrects.  
GEAC was set up by the ministry of environment and forests to regulate research, testing and commercial release of GM crops, food and organisms  
*The aim and objectives of GEAC are*  
(i) to permit the use of GM organisms and their products for the commercial applications  
(ii) to adopt the procedures for restriction, production a scale, import, export and application of GM organisms  
(iii) approval to conduct a large scale field trails and release of transgenic crops in the environment  
(iv) to authorise agencies or persons to have large scale production and the release of GM organisms into the environment or curb and take **punitive** action against them
- 9 **(a)**  
*Food production can be increased by applying biotechnology is the following ways*  
(i) Agrochemicals based agriculture  
(ii) Organic agriculture  
(iii) Genetically engineered crop base agriculture  
Fish farming in isolated water bodies is called pisciculture
- 10 **(a)**  
All the statements given are correct for Bt transgenic plant except option (d).
- 11 **(b)**  
DDNA fingerprinting technique was discovered by **A Jeffreys**. It is a modern technique that compares sets of DNA by locating identical sequences of nucleotides. It is oftenly used in forensic matters.
- 12 **(c)**  
Removed during the maturation of proinsulin to insulin.  
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

- 13 **(d)**  
The recombinant DNA technology process have made great impact in the area of healthcare by the mass production of safe and more effective therapeutics drugs. Further, the recombinant therapeutics do not induces unwanted immunological responses. Now, about 30 recombinant therapeutics have been approved for human use all over the world. In India, 12 of these are presently being marketed
- 14 **(c)**  
PCR can detect very low amount of DNA. PCR is now usually used to detect HIV in suspected AIDS patients. It is also used to detect mutations in the genes in suspected cancer patients. It is a good technology to detect many other genetic disorders. Option III and IV are incorrect
- 15 **(b)**  
The body would not reject it as it has not yet recognised self
- 16 **(c)**  
Transgenic mice are developed to tests the safety of polio vaccine before being used on human
- 17 **(d)**  
The patents have been taken out on the plants such as Basmati rice (*Oryza sativa*), black pepper (*piper nigrum*), pomegranate (*Punica granantum*), Indian mustard (*Brassica compestris*), turmeric (*Curcuma/longa*) and neem (*Azadirachta indica*). US, Japanese and German companies are the principal patenting pirates
- 18 **(c)**  
 $T_i$  –plasmid, used for making transgenic plants is found in the bacterium *Agrobacterium tumefaciens*.  $T_i$ -plasmid is used as a vector for gene transfer to plant cells.  $T_i$  –plasmid has a vir region responsible for irulence towards host and

a *t*DNA region, which is transferred to the host.

19 (c)

The main challenge for the production of insulin using RiDNA technique was getting insulin assembled into a mature form. In 1983, Eli Lilly an American company, first prepared two DNA sequences corresponding to A and B chains of human insulin and introduced them into the plasmids of *Escherichia coli* to produce insulin chains. Chains A and B were produced separately, extracted and combined by creating disulphide bonds to form human insulin (humulin)

20 (d)

An organism (such as bacterium) that will grow on a minimal medium (means having no specific nutritional requirement) is called a prototroph, while a 'mutant' of it that will not grow on a minimal medium but requires the addition of some compound like an amino acid or vitamin is called **auxotroph**.

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