

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

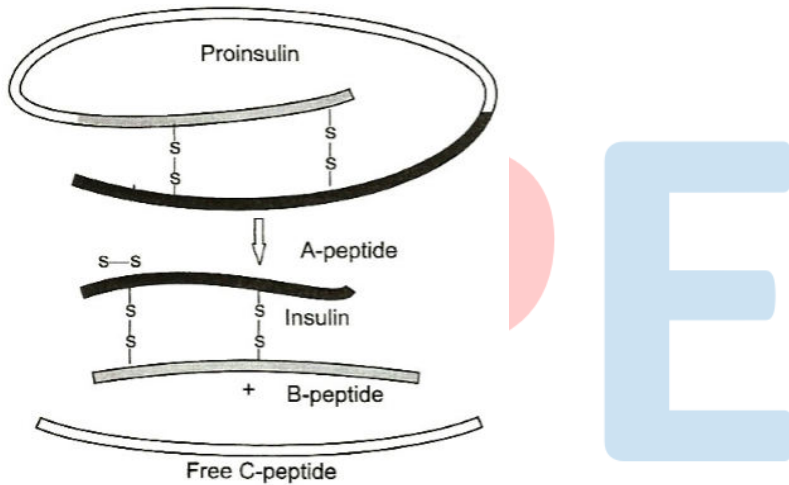
- 1 (c)  
Out of the given options
- 5' – GAATTC – 3'
- 3' – CTTAAG – 5'
- Is a palindromic sequence that can be cut at about the middle by particular restriction enzyme.
- 2 (d)  
**Monoculture** involves the exclusive cultivation of a single crop over wide areas. It is an efficient way to use certain kinds of soils but the crop plants grown in monoculture are highly prone to pests and thus, it carries the risk of an entire crop being destroyed with the appearance of a single pest species or disease.
- 3 (a)  
Agrochemical based agriculture includes fertilisers and pesticides. Agrochemicals are expensive for farmers in developing countries and also have harmful effects on environment
- 4 (b)  
Golden rice a variety of *Oryza sativa* is produced through genetic engineering to biosynthesize' beta-carotene, a precursor of pro-vitamin-A in the edible parts of rice. The research that led to golden rice was conducted with the goal of helping children who suffer from vitamin-A deficiency in poor countries. Golden rice has been bred to be especially disease-resistant, resulting in better crop yields.
- 5 (a)

Plants are more rapidly manipulated by genetic engineering than animals because single somatic cell can regenerate a whole plant body.

- 7 **(d)**  
Silencing of *mRNA* molecule' in order to control the production of a harmful protein has been used in the protection of plants from nematodes
- 8 **(c)**  
*CryI* Ab.  
 $\beta$ -Carotene pro vitamin-A.  
Golden rice a variety of *Oryza sativa* is produced through the genetic engineering of biosynthesis beta-carotene, a precursor of provitamin-A in the edible parts of rice. The research that led to golden rice was conducted with the goal of helping children who suffer from vitamin-A deficiency and blindness in poor countries. Golden rice has been breed to be especially disease-resistant, resulting in better crop yield
- 9 **(c)**  
These hormones are used in the dairy industry, when injected into cows would increase their milk production.
- 10 **(c)**  
'Bt' in 'Bt' cotton stands for *Bacillus thuringiensis*, a soil bacterium from which Bt gene (encoding Bt toxin) is obtained. Somatic hybridization involves the fusion of protoplast (i.e, cell minus cell wall) of two cells. Flavr savr is a transgenic tomato with hard skin and improved flavor and recombinant hirudin is obtained from the seeds of transgenic *Brassica napas* at commercial scale.
- 11 **(b)**  
Biopatent is a government protection to an inventor of a biological material, securing to him for a specific time the exclusive right of manufacturing, exploiting, using and selling an invention
- 12 **(a)**  
Indian Basmati was crossed with semi dwarf variety and was claimed as a new variety for

which the patent was filled by a USA company

- 13 **(b)**  
Calcitonin is a hormone secreted from parafollicular cell of thyroid gland. It is chorionic gonadotrohin hormone which is medically useful recombinant product in the treatment of infertility.
- 14 **(d)**  
Characteristic of *Bt* cotton are high yield and resistance to boll worms.
- 15 **(a)**  
Maturation of proinsulin into insulin after removal of C-peptide



- 16 **(b)**  
Protoplasts are naked cells from which cell wall has been removed. Fusion of protoplast is done with solution of PEG or a very brief high voltage current.
- 17 **(a)**  
Introducing foreign genes.  
Animals whose DNA is manipulated to possess and express an extra (foreign) gene are known as transgenic animals. Transgenic rats, rabbits, pigs, sheep and cows have been produced
- 18 **(a)**  
(i) → (ii) → (iii) → (iv).  
Adenosine deaminase enzyme is very important for the immune system to function. In the absence

of adenosine deaminase enzyme, purine metabolism is disturbed and T-lymphocytes fails to function. ADA deficiency can lead to Severe combined Immune Deficiency (SCID) SCID is caused due to defect in the genes for the enzyme adenosine deaminase. The genetic diseases that are being investigated for gene therapy ranges from sickle-cell anaemia to Severe Combined Immuno Deficiency (SCID). In some children, ADA deficiency can be cured by bone marrow transplantation However, in others it can be treated by the enzyme replacement therapy, in which functional ADA is given to the patient by injection. But in both approaches, the patients are not completely cured. For permanent cure, gene isolated from the bone marrow cells producing ADA at early embryonic stage can be a possible cure

- 20 **(b)** Manipulation of DNA becomes easy due to invention of polymerase chain reaction developed by **Karry Mullis**. It generates microgram quantities of DNA copies of the desired DNA segment, present even as a single copy.

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