Genetics for the Future

Que 1: Arrange columns B and C in accordance with column A. ***Marks :(3)***

A	B	C
a) genetic glue	**i) Carries foreign genes**	**I) Plasmid**
b) genetic scissors	**ii) Cut the genes**	**II) Junk gene**
c) Vectors	**iii)Join sugar and phosphate**	**III) Restriction endo nuclease**
	iv) Join the genes	**IV) Ligase**

Ans:

A	B	C
a) genetic glue	iv) Join the genes	IV) Ligase
b) genetic scissors	ii) Cut the genes	III) Restriction endo nuclease
c) Vectors	i) Carries foreign genes	I) Plasmid

Que 2: Identify the relationship between the following and explain their role in gene therapy.

(a) gene mapping

(b) human genome project. ***Marks :(2)***

Ans: The Human Genome Project is the project that helped to locate genes and their locations through gene mapping. Gene mapping helps to identify the location of a gene in the DNA. Gene therapy is a method of treatment in which the genes that are responsible for diseases are removed and normal functional genes are inserted in their place.

Que 3: What is the importance of 'genetic scissors 'and 'genetic glue' in connection with genetic engineering ? ***Marks :(2)***

Ans: Genetic scissors - To cut the genes

Genetic glue - To join the genes

Que 4: What is the basis of genetic engineering? ***Marks :(1)***

Ans: The basis of genic engineering is the discovery of the fact that gens can be cut and joined.

Que 5: Write the significance of each of the following steps in the process of producing insulin-producing bacteria through genetic engineering. ***Marks :(3)***

a) The plasmid DNA is extracted.

b) DNA is deposited in the bacterial cell.

c) The desired gene is cut from the human DNA.

Ans: a) The insulin gene from human is incorporated to bacteria by ligating it in to the plasmid DNA of the bacteria.

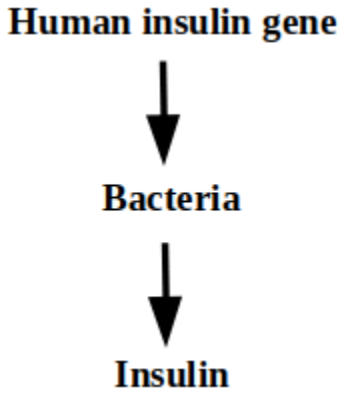
b) The insulin gene extracted from the human is deposited in the bacterial cells and produces insulin by providing favorable environment for growth.

c) Insulin is produced by ligating the desired gene from the human DNA in to plasmid extracted from the bacterium.

Que 6: (a)What is the technology indicated in the illustration?

(b) What is the limitation in producing insulin using the method mentioned in the illustration?

(c) What is the solution that biotechnology has come up with to overcome this?
Marks :(3)



Ans: a) Genetic engineering

b) Difficulty in the culturing of bacteria.

c) Use animals that can be easily cultivate.

Que 7: How does the new genes become part of target cell through genetic engineering? ***Marks :(2)***

Ans: Vectors like bacterial DNA (plasmid) is used to transport the desired gene from one cell to another cell. DNA with added genes is inserted into the target cell.

Que 8: Give two examples of misuse of biotechnology, which is a threat to human race? ***Marks :(2)***

Ans: Threat to indigenous varieties

Bioweapons

Genetic modification is the violation of rights.

(ANY TWO)

Que 9: "Genetic engineering can make a great leap in therapeutic field in the coming period".

Evaluate this statement. ***Marks :(4)***

Ans: Diagnosis

Gene therapy

Pharm animals

Varieties with high Immunity and High yielding (Any four)

Que 10: Human genome project can be considered as a success of fellowship. Analyse the statement in terms of the achievements of the project? ***Marks :(2)***

Ans: With the cooperation of laboratories across the globe, the exact location of the genes in the DNA is accurately mapped, which pave new possibilities, including in therapeutics.

Que 11: The possibilities of biotechnology is utilised by man even before the development of biotechnology. Do you agree with this statement. Substantiate your opinion. ***Marks :(2)***

Ans: Agrees.

Food products were made using yeast.

Produce hybrids and select the best ones.

(any two)

Que 12: Who invented DNA finger printing? How does this technology help in detecting crimes? ***Marks :(2)***

Ans: Alec Jeffreys

DNA of the skin, hair, nail, blood and other body fluids obtained from the place of murder, robbery etc., is compared with the DNA of suspected persons. Thus, the real culprit can be identified from among the suspected persons through this method.

Que 13: Identify the relationship between the words given below and fill in the blanks.

Genetic scissors : restriction endonuclease

Genetic glue: …… ***Marks :(1)***

Ans: Ligase

Que 14: Different steps in the synthesis of genetically modified bacteria which can produce human insulin is given below. Arrange them in the correct order. ***Marks :(3)***

a) separates bacterial DNA

b) cuts the gene which controls the synthesis of insulin.

c) DNA is inserted into the bacterial cell.

d) bacteria synthesizes inactive insulin

e) Provides suitable conditions for the multiplication of bacteria

f) Joins insulin producing gene with the bacterial DNA

Ans: b) cuts the gene which controls the synthesis of insulin.

a) separates bacterial DNA

f) Joins insulin producing gene with the bacterial DNA

c) DNA is inserted into the bacterial cell.

e) Provides suitable conditions for the multiplication of bacteria

d) bacteria synthesizes inactive insulin

Que 15: Write suitable one word for the statements given below.

a) Nonfunctional genes

b) The complete genetic material present in an organism. ***Marks :(2)***

Ans: a) Junk genes

b) genom