



कुल पृष्ठ संख्या-32 (द्विवर्ष पेज सहित)



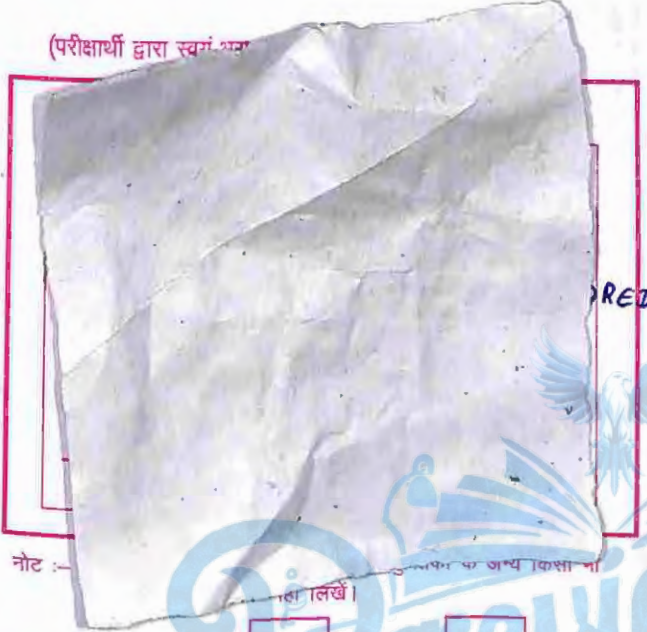
संख्या

2639414

# माध्यमिक शिक्षा बोर्ड, राजस्थान, अजमेर

उच्च माध्यमिक परीक्षा

(परीक्षार्थी द्वारा स्वयं भरा)



नोट :-

माध्यम - हिन्दी ☐ अंग्रेजी ☒

विषय Biology

परीक्षा का दिन SATURDAY

दिनांक 16-04-22

नोट :- परीक्षार्थी के लिए आवश्यक निर्देश इस पृष्ठ के पिछले भाग पर उल्लेखित हैं। जिन्हें सावधानी पूर्वक पढ़ लें व पालना अवश्य करें।

- परीक्षक हेतु निर्देश :- (1) परीक्षक को उपरोक्त सारणी अनुसार प्राप्तांक भरना अनिवार्य हैं, अन्यथा नियमानुसार दंडित किया जायेगा।  
(2) परीक्षक उत्तर पुस्तिका के अन्दर के पृष्ठों के बायीं ओर निर्धारित कॉलम में लाल इंक से अंक प्रदत्त करें।  
(3) कुल योग भिन्न में प्राप्त होने पर उसे पूर्णांक में ही परिवर्तित कर अंकित करें (उदाहरणार्थ : 15 ¼ को 16, 17 ½ को 18, 19 ¾ को 20)

| प्रश्नवार प्राप्तांकों की सारणी<br>(परीक्षक के उपयोग हेतु) |            |                                         |            |
|------------------------------------------------------------|------------|-----------------------------------------|------------|
| प्रश्नों की क्रम संख्या                                    | प्राप्तांक | प्रश्नों की क्रम संख्या                 | प्राप्तांक |
| 1                                                          | 9          | 19                                      | 4          |
| 2                                                          | 4          | 20                                      | 4          |
| 3                                                          | 8          | 21                                      |            |
| 4                                                          | 1/2        | 22                                      |            |
| 5                                                          | 1/2        | 23                                      |            |
| 6                                                          | 1/2        | 24                                      |            |
| 7                                                          | 1/2        | 25                                      |            |
| 8                                                          | 1/2        | 26                                      |            |
| 9                                                          | 1/2        | 27                                      |            |
| 10                                                         | 1/2        | 28                                      |            |
| 11                                                         | 1/2        | 29                                      |            |
| 12                                                         | 1/2        | 30                                      |            |
| 13                                                         | 1/2        | 31                                      |            |
| 14                                                         | 1/2        | योग                                     | 56         |
| 15                                                         | 1/2        | प्राप्त अंकों का कुल योग<br>(Round off) |            |
| 16                                                         | 3          | अंकों में                               | शब्दों में |
| 17                                                         | 3          | 56                                      | Fifty six  |
| 18                                                         | 3          |                                         | (द्विपद)   |

परीक्षक के हस्ताक्षर [Signature] संकेतांक 37763

प्रमाणित किया जाता है कि इस उत्तर पुस्तिका के निर्माण में 58 जी.एस.एम. ईको मैपलिथो कागज ही उपयोग में लिया गया है। 168/2021

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Section - A

Ans-1

(i)

(A) 46

(ii)

(A) Beetroot

(iii)

(D) Turner's Syndrome

(iv)

(B) Adenine

(v)

(C) Filarial Worm

(vi)

(D) Totipotency

(vii)

(D) Typhoid

(viii)

(A) Producers

(ix)

(D) IAC and IIAb

Ans-2

(i)

When there is breeding between animals of the same breed, it is called inbreeding

(ii)

Bt toxin is produced by bacterium Bacillus thuringiensis

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(iii) If an inheritable mutation is observed in population at high frequency, it is called DNA Polymorphism.

(iv) When a species become extinct, the other plant and animal species associated with it is obligatory to extinct, is called Co-extinction.

511111112 (04)

Ans-3

(i) Biotechnology -

In a biology, the technology is used for products making and other products or in medicine called biotechnology.

According 'EFB' Biotechnology refer to the interaction of natural science and organism, cells parts, these of, molecular analogous it's products and services.

(ii) If the progeny have allele  $I^A$  and  $i$  so, progeny blood group is 'A'

(iii) Biopiracy -

Biopiracy refer to the

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use of bio-resource by multinational Companies and other organisation without proper authorization of Country and people concerned without compensatory payment

Eg. American Company take patent of rice of Indian varieties

(iv) Green and red Colours cannot be discriminate by person in colour-blindness.

(v) Innate Immunity = Those immunity whose take by inbirth time by parents called innate immunity

These immunity include for barriers -

(i) Physical barrier

(ii) Physiological barrier

(iii) Cellular barrier

(iv) Cytokine barrier

(vi) Genetically modified organisms -

Gmo are those organisms whose Gene is manipulate for other purpose like bacteria, fungus, animal, plants etc Gmo organism safe from pests and

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diseases

(vii) 'Inverted' type of pyramids of biomass is found in the ocean.

(viii) Ex-situ Conservation -

When the biodiversity is conserved ~~at~~ outside the organism habitat or in man-made place called Ex-situ Conservation.

e.g. - Botanical Garden  
Zoological park  
Cryopreservation  
Sperm Bank, Seed Bank etc.

1+1+1+1+1 = 05

Section - B

Ans-4.

Three Contraceptive methods -

(i) IUD (Intra Uterine Device) is inserted by experts in uterus of female.

It includes three parts -

- i) Mediated - e.g. - Lippes Loops
- ii) Copper releasing - e.g. - Copper-T
- iii) Hormonal - e.g. - LNG-20

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(ii)

Sterilization -

In female Called Tubectomy

In male Called Vasectomy

(iii)

Contraceptive pills (made by progesterone  
or combination of oestrogene and  
progesterone)

Ans-5:

Gene gun (Biolistic) -

In these guns,  
the DNA which is coated by  
gold and aluminium (Al) is injected  
into cells of host. These are mainly  
used to plant cells.

→ It is used for to enter R-DNA into  
host organism cell.

Ans-6

Three important points of beekeeping -(i) for beekeeping is necessary to  
known the nature of bees(ii) known about bees swarming and  
reproduction time(iii) ~~bee~~ management of beehives and  
different places for different seasons.

Ans-7:

Animal breeding -

When the done breeding  
between animals for wanted and



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good character in animals called  
Animal breeding

Animal breeding

Inbreeding

(Same breed, common ancestor  
to 4-6 generation)

Outbreeding

Outcrossing

(Ancestor not have

4-6 generation)

Outbreeding

(different breed)

Interspecific

hybridization

(cross unrelated species)

Aims -

(i) By the animal breeding good  
quality produced meat and milk  
by bull and cow respectively

(ii) Increases the Dairy farm  
management and its products

Ans- Q. following reason are follows for  
population growth explosion -

(i) Increase birth rate

(ii) Decrease maternal mortality rate

(iii) Decrease infant mortality rate

(iv) Increase life expectancy

(v) Increase the reproductive age people



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Ans-9. These feature required in cloning vector -

- i) ori
- ii) Selectable marker
- iii) Gene cloning
- iv) Restriction Site

Selectable marker -

A vector is necessary to have selectable marker because it's help to transformant and non-transformant.

E.g - PBR-322 have ampr and tetr<sup>R</sup> (ampicillin and tetracycline) is a Antibiotics resistant gene.

Ans-10.

Biotechnology in Medicine -

By these, Covid developed 30 recombinant therapy and India published 20 type for use.

Application are follows -

i) Genetic Engineered Insuline -

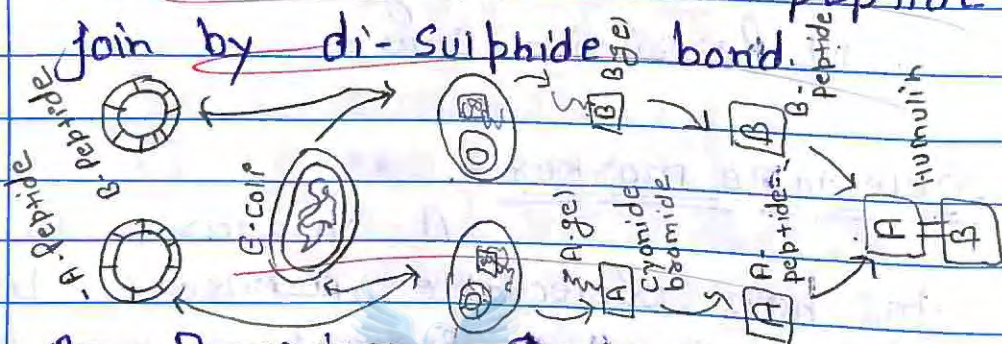
Insulin is an greatest demand in our country.

Insulin take from the fats of animals (like pigs etc) but these are allergic problems in

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humans. [Proinsulin  $\xrightarrow{\text{Removal of C-peptide}}$  Mature insulin]  
 Insulin before have pro insulin  
 which removed C-peptide form  
 mature insulin. These peptide  
 join by di-sulphide bond.



An American Company ~~develops~~  
 Eli Lilly develop the two  
 corresponding DNA of the peptide  
 A and B, and use of E. coli as  
 host, human made insulin (Humulin)  
 developed.

Ans-11)

Advantage of GM Plants -

- i) GM Plants is resistant to disease and pests
- ii) GM Plant resistant to post-harvesting losses.

Genetically modified plant example -

Bt Cotton - which is coded by specific gene Cry and Cry II Abi protect of Cry I AC to Cotton



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ballworm

Ans-12.

### Alien Species Invasion →

The other species take from other species habitat. Then home species cause of struggle and may be to extinct. The other species invade in other organism habitat called Alien species and Exotic species.

E.g - i) Nile perch → It is fish of Nile river which invade in Victoria lake that cause of extinction of 200 species of Chichlid fish of Victoria lake.

ii) Carpet grass (Parthenium grass)

iii) Lantana

iv) Water hyacinth (Eichhornia crassipes)

v) Africa Cat fish

Ans-13

### Pyramid of Energy =

These pyramid is always upright because in its producer energy is larger than consumers.

After produced only 10% energy can be flow, 90% energy is loss.



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Energy of pyramid follow 10% law

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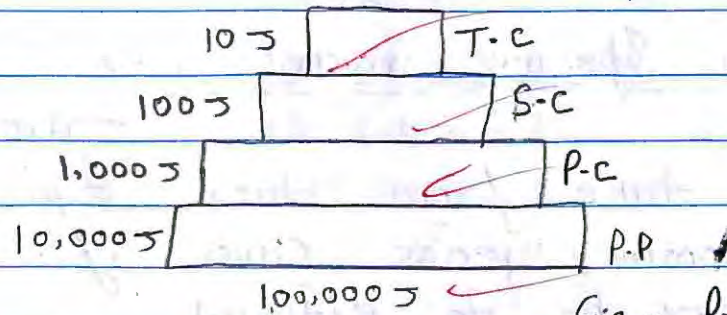


Fig - Pyramid of Energy

Ans-15

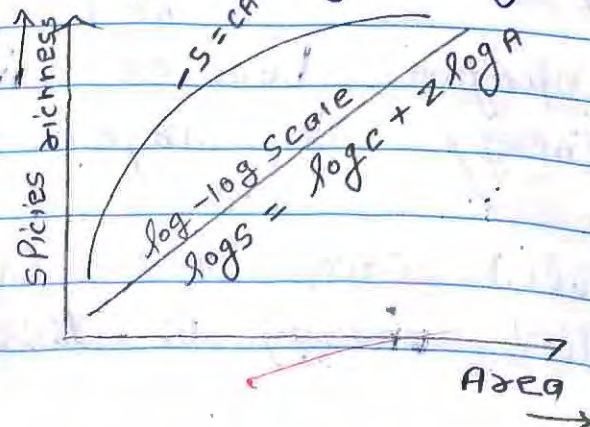
Species Area Relation ship =

These relation given by Alexander von Humboldt.

According to Humboldt when the species is increase, its area is increase.

They study various taxonomic groups like Bryophytes, Gymnosperms etc that given to rectilinear hyperbola.

These relation shown by straight line graph of log-log scale -





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Where -

$S$  = Species richness

$c$  =  $y$ -intercept

$A$  = Area

$Z$  = Slope of line ( regression Constant)

The value of  $Z$  is generally same of all species is 0.1 to 0.2

But to increase to the areas the value of  $Z$  increase 0.6 to 1.2

E.g - The value of  $Z$  for fungivorous is 1.15

### Section - C

Ans 16

Sexual reproduction →

Those reproduction both the parent take part and fusion of gamete take place called Sexual reproduction.

E.g - Human, Hen, Dog, etc.

Menstrual Cycle -

- i) These cycle done by Primates female body.
- ii) Menence is present



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- (iii) Monthly periods (recurrence time  
definite)
- iv) Intense coupling desire is less  
because it's control by FSH, Estrogen  
etc hormones

e.g - Human, monkey etc

- v) After menstrual Cycle @ 10-17th day  
period the chance of ovulation  
is maximum

Ans 17.

Test Cross -

The cross done  
between F<sub>1</sub> generation and recessive  
parents called Test Cross.

e.g -  
Heterozygous  
tall

(Tt)

Cross

(tt)

Homozygous  
dwarf

(T)

(t)

(t)

(t) - Gamete

(Tt)

(Tt)

(tt)

(tt)

Heterozygous  
tall

Heterozygous  
tall

Homozygous  
dwarf

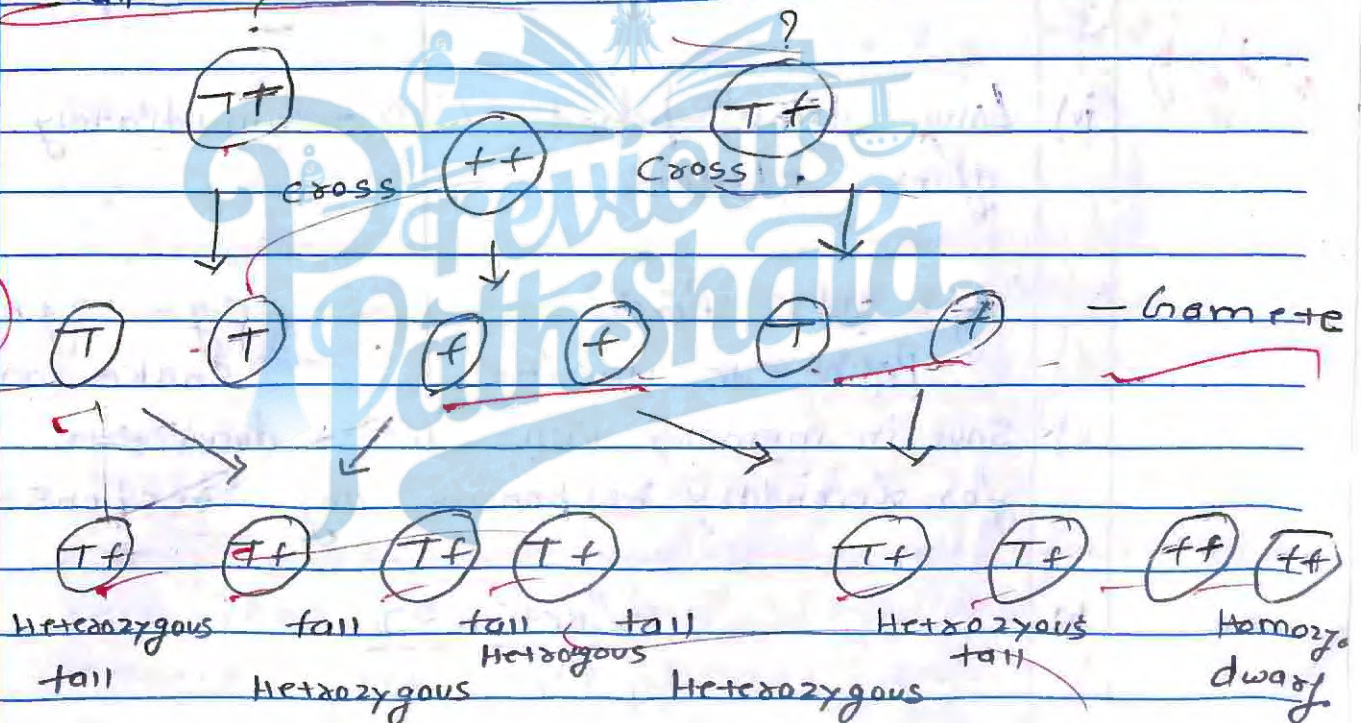
Homozygous  
dwarf

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Phenotype ratio - 1:1Genotype ratio - 1:1

Test Cross is used for the heterozygosity and homozygosity and Genotype or phenotype of parent plant & progeny have all tall it means parent homozygous tall, if progeny have half tall and half short means progeny heterozygous tall.



These progeny all are tall means parent is homozygous tall.

These progeny are half tall and half dwarf means parent is heterozygous tall.

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Ans-18

Active ImmunityPassive immunityi) The Antigen is  
injectAntibody is directly  
injectii) It activate our  
immune systemIt doesn't activate  
our immune systemiii) Less sideeffectssideeffect can  
be exposeiv) Long time period  
after effectsimmediately effectEg - DPT, BCG  
Polio etc vaccineEg - IgA, IgG  
Snake venom Antidotev) Save in memory cells  
for secondary responseIt doesn't have  
any response

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Section - D

Ans-19

Floriculture -

When the flower  
species is cultured  
uses like perfumes  
ornaments etc  
culture

for many  
decoration  
called floriculture



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In floriculture, many type species of flowering plants are cultured.

Stamen -

Androceium (male flower part)  
Single Unit Called Stamen

Stamen is an ~~sta~~ include three parts -

i) filament -

It's a stalk like structure which found in flower

ii) Connective -

It's a connective tissue which join filament and anther

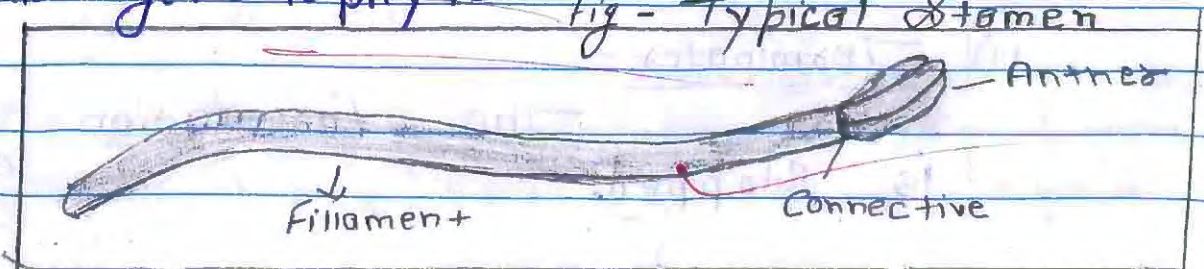
iii) Anther -

It's a bilobed in which each lobe have two chambers.

These four chambers contain MMC (microspore mother cell) which form pollen grain.

Pollen grain first cell stage of male gametophyte

Fig - Typical Stamen





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Ans-20

### Transcription -

The processing of copying of genetic information from one strand (template strand) of DNA in the form of ~~mRNA~~ mRNA called Transcription.

'or'

The formation of RNA (mRNA) from the DNA called Transcription

Transcription unit include following parts -

#### i) Promoter -

These ~~area~~ region promote to transcription by adding of RNA polymerase Enzyme.

#### ii) Structural / Coding region -

Where mRNA process by DNA. These region to making

#### iii) Terminator -

The formation of mRNA is stopped.

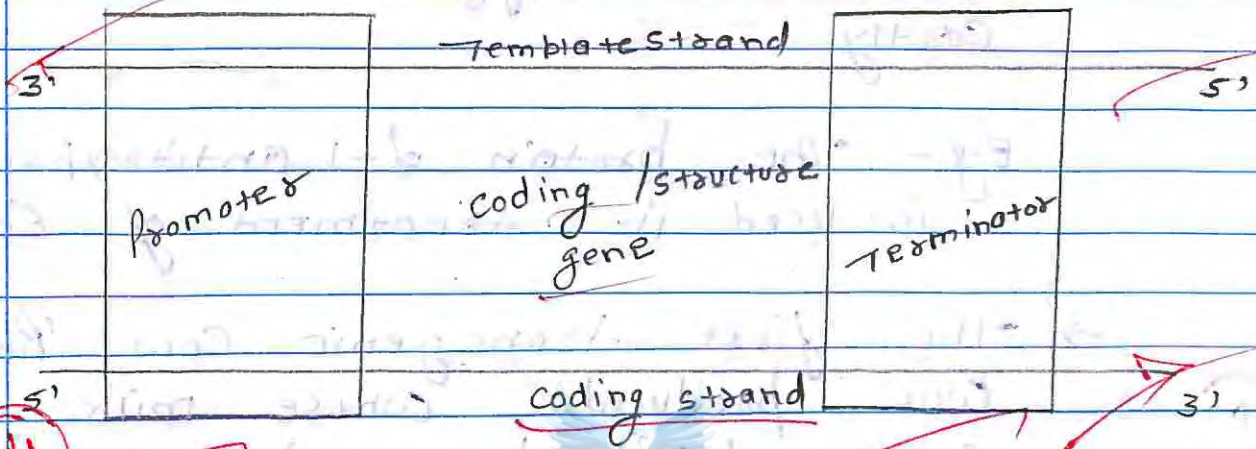


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Fig - Transcription Unit



Transcription include two Strands -

i) Template Strand -

These strand is  $3' \rightarrow 5'$  direction in which m-RNA form in  $5' \rightarrow 3'$  direction. It is anti to m-RNA Codon.

ii) Coding Strand -

These strand is  $5' \rightarrow 3'$  direction which have same to m-RNA Code

Ans-14- Following roles of transgenic product in biological products -

The products make by other way which may very costly but



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Which product form by transgenic animal are effective and less costly

E.g - The protein  $\alpha$ -1 antitrypsin which is used in treatment of Emphysema

→ The first transgenic cow 'Rosie' was produced whose milk have 2.4 gram/litre human protein  $\alpha$ -lactalbumin which is useful for human babies

Transgene animals produced by its manipulated its DNA.

55 x 55 = 3025

The End

Total  
(56)

Fifty six

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