



केवल मूल्यांकनकर्ता के उपयोग हेतु!

माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

32 पृष्ठीय

केवल परीक्षक द्वारा भरा जावे। प्रश्न क्रमांक के सम्मुख प्राप्तांकों की प्रविष्टि करें।

प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)	प्रश्न क्रमांक	पृष्ठ क्रमांक	प्राप्तांक (अंकों में)
1		5	17		5
2		5	18		5
3		5	19		5
4		5	20		5
5		5	21		5
6		5	22		5
7		5	23		5
8		5	24		5
9		5	25		5
10		5	26		5
11		5	27		5
12		5	28		5
13		5			
14		5			
15		5			
16		5			

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

प्रमाणित किया जाता है कि अन्दर के पृष्ठों के अनुरूप मुख्य पृष्ठ पर अंकों की प्रविष्टि एवं अंकों का योग सही है। निर्धारित मुद्रा: नाम, पदनाम, मोबाईल नम्बर, परीक्षक क्रमांक एवं पदांकित संस्था के नाम की मुद्रा लगाएं।

उपमुख्य परीक्षक द्वारा भरा जावे

हस्ताक्षर एवं निर्धारित मुद्रा

परीक्षक द्वारा भरा जावे

एवं निर्धारित मुद्रा

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Ques = 01

(i.) (a.) Herbivorous ✓

(ii.) (a.) Penicillium ✓

(iii.) (b.) 12-18 years ✓

(iv.) (b.) the three ✓

(v.) (a.) LH ✓

(vi.) (b.) Milum ✓

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Ques = 02

(i.) over-exploitation

(ii.) Dominant

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(vi.) Jal

Ques = 04

(i.) Apomixis

(c.) Grass family

(ii.) Darwin

(a.) Galapagos Island

(iii.) Joddy

(b.) Southern India

(iv.) Agarose

(c.) Sea weeds

(v.) Detritivorous

(d.) Earthworm

Ques = 05

(i.) 'Ovary' which is a part of female reproductive

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system, forms the fruit.

(ii) 'Colostrum' is a thick, pale-yellow coloured milk which comes out from mother's mammary gland during first few days of parturition, which is very necessary for after new born baby.

(iii) Colour blindness and Haemophilia are Mendelian or Genetic Disorders.

(iv) Restriction enzyme is a 'molecular scissor' in genetic engineering. It is a type of endonuclease enzyme used to cut DNA into fragments. It is isolated from different bacteria.

Ex: Hind II, EcoRI

(v) There are '34' Biodiversity Hotspots are there in the world. [According to 2011 report].
From which 3 are in India.

① Himalaya, ② Indo-Burma ③ Sri Lanka-Western Ghats.



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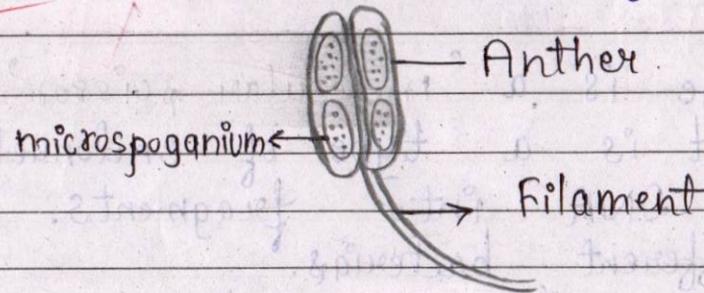
Ques = 06

Anther is a part of male reproductive system in angiosperms flowers.

Anther is bilobed.

Two parts of anther :- (1) Each lobe contains two theca that it is, dithecous.

(2) Each lobe contains two microspogonium or pollen sac which contains millions of pollen grains.



Ques = 07

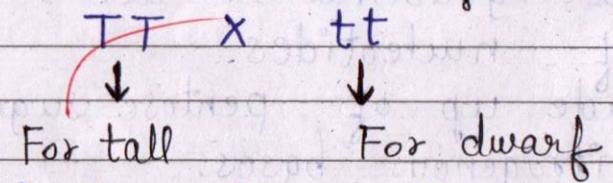
Monohybrid Cross :- It is a type of cross in

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which only ~~#~~ one pair of character is crossed.
Ex:- Character = Plant Height

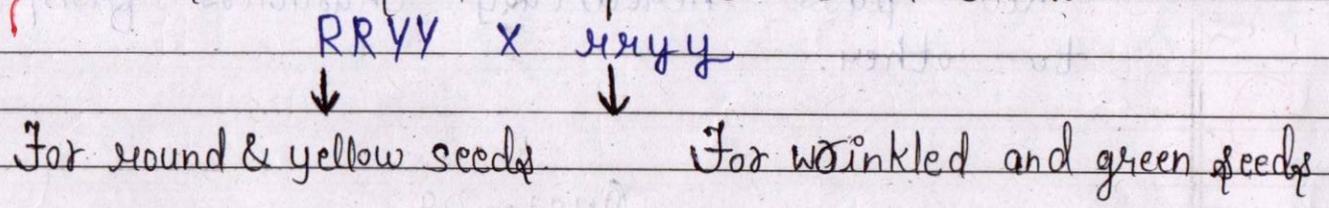


In this, Phenotypic ratio = 3:1
and Genotypic ratio = 1:2:1

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Dihybrid Cross :- It is a type of cross in which two pairs of characters are crossed.

Ex:- Characters :- Seed shape & seed colour



In this, phenotypic ratio = 9:3:3:1
and Genotypic ratio = 1:2:1:2:4:2:1:2:1

8

$$30 + 2 = 32$$



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Ques = 08

DNA stands for Deoxyribonucleic acid. It is a long polymer of nucleotides.

Nucleotides are made up of pentose sugar, phosphoric acid and nitrogenous bases.

In DNA, Adenine, Guanine, Thymine, and Cytosine nitrogenous bases are found.

DNA is the genetic material in almost all organisms except some viruses. DNA is very important to pass hereditary characters from one generation to other.

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Ques = 09

'Penicillium notatum' is the species of fungus which is used in the production of the antibiotic called 'Penicillin'.



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While working on Staphylococcus bacteria, 'Alexander Fleming' found that bacteria is unable to grow near the mould, which grows on his one of unwashed plate. That mould was penicillin notatum which kills or retard the growth of bacteria.

Hence, 'Alexander Fleming' who discovered it named it as 'penicillin' antibiotic.

Ques = 10

Genetic Modified Organism (GMO) are those whose gene has been manipulated for the welfare of humans.

Advantages of Genetic Modified Organisms are :-

(1.) They are used to enhance the nutritional value of food.

Ex:- Golden Rice, which is a very source of vitamin A.

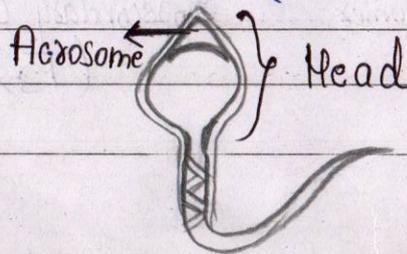
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Ques = 13

Function of :-

(i) Corpus luteum \Rightarrow Ruptured Graafian follicle converts into Corpus luteum. Function of corpus luteum is to secrete a hormone, progesterone which is necessary to maintain the endometrium layer for the implantation of ~~ovum~~ blastocyst. If fertilisation does not occur then corpus luteum degenerates.

(ii) Acrosome \Rightarrow Male sperm head contains cap-like structure known as acrosome. It contains various enzymes necessary for the fusion of sperm with ovum to complete fertilisation. Enzymes help to break down various layers of ovum and get entry of sperm.



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(iii) Tapetum \Rightarrow Tapetum is the outermost layer of microspogonium. It provides nutrition to the ~~g~~ developing pollen grains inside microspogonium. It also helps in the formation of outer layer of pollen grain i.e. 'Sporopollenin'.

Ques = 14

is a condition in which

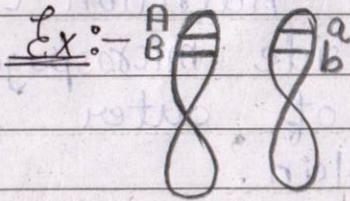
(1) Heterozygous \Rightarrow Heterozygous \wedge individuals carries dissimilar pair of alleles of a character. They produce two types of gametes. They carries both dominant and recessive allele.

Ex:- Tt, Rr, Yy.

(2) Linkage \Rightarrow Linkage is a physical association of genes in chromosomes. Genes in which linkage is seen are called linked genes. Linked genes are present on different locus on same chromosome.



Linkage $\propto \frac{1}{\text{Crossing over. distance b/w genes}}$



gene A and B shows linkage and a and b shows linkage

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(3.) Test cross \Rightarrow It is a type of cross in which dominant individual is crossed with homozygous recessive parent.

Ex:- $Tt \times tt$

	T	t
t	Tt	tt
t	Tt	tt

Phenotypic ratio = 1:1
Genotypic ratio = 1:1

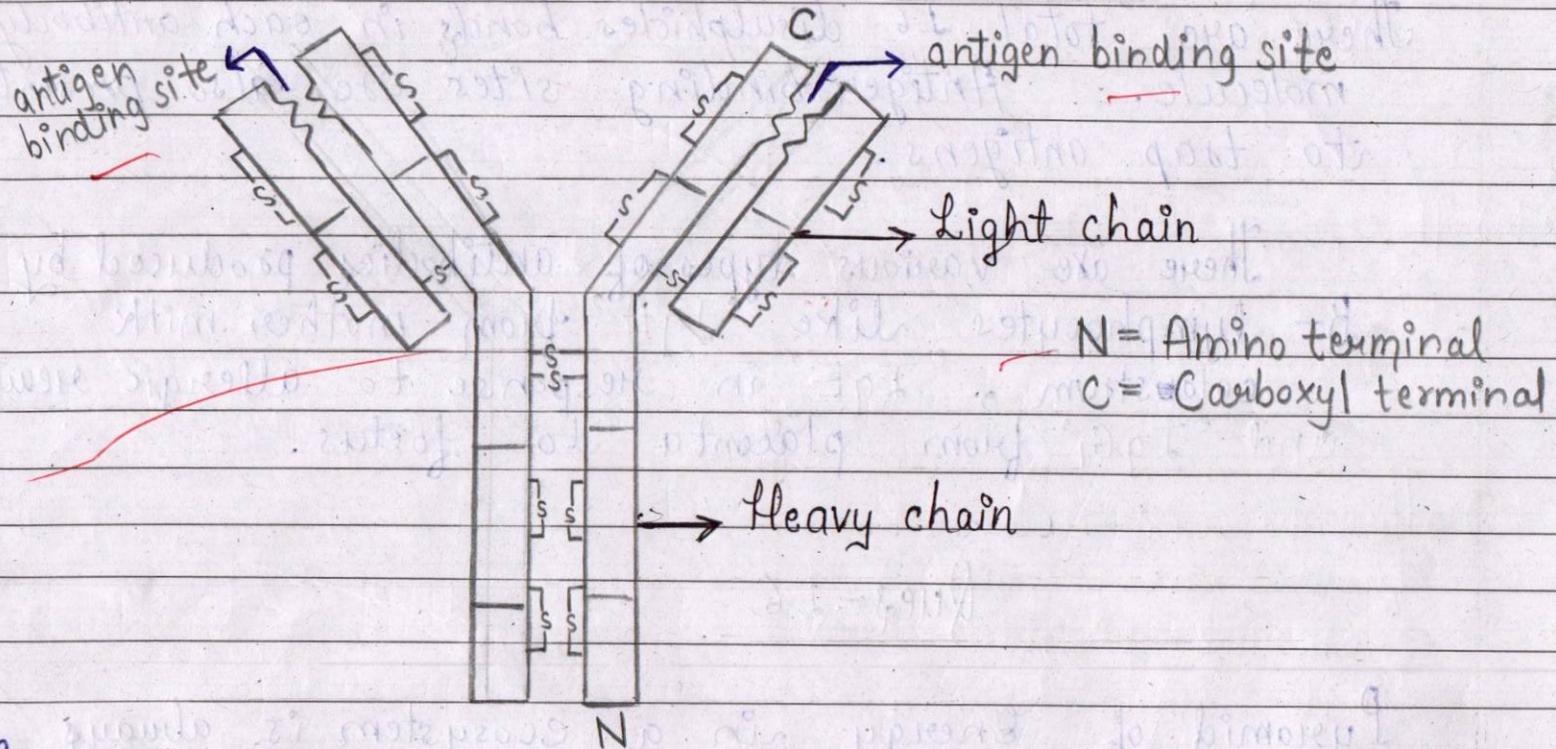
This cross is done to identify where the dominant individual possesses homozygous or heterozygous alleles.



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Ques = 15

Antibodies are proteins produced by B-lymphocytes in response to the antigens enters in the body of host.



Structure of an antibody is like Y-shaped in which

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two heavy chains of polypeptides and two light chains of polypeptides are connected through disulphide bonds. That is why antibody arrangement is represented by H_2L_2 .

There are total 16 disulphide bonds in each antibody molecule. Antigen binding sites are also present to trap antigens.

There are various types of antibodies produced by B-lymphocytes like 'IgA' from mother milk colostrum, 'IgE' in response to allergic reactions and 'IgG' from placenta to foetus.

Ques = 16

Pyramid of Energy in a ecosystem is always upright. This is because \checkmark energy flows when

49 + 0 = 49

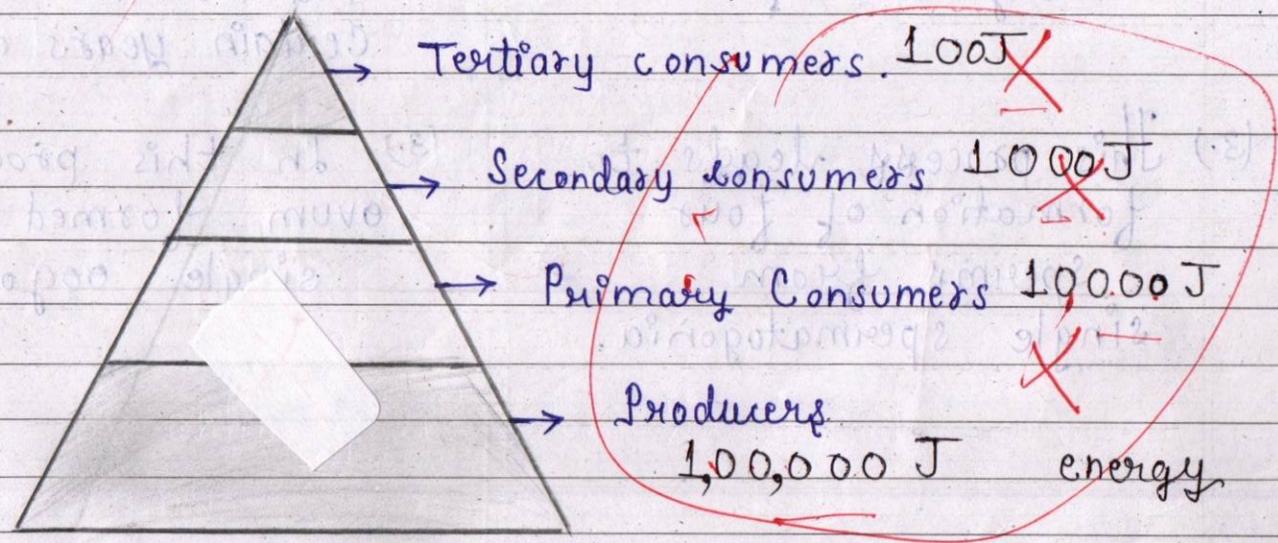


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from lower trophic level to higher trophic level then according to 10% law, only 10% of energy from lower trophic level reach to next higher trophic level, and 90% of energy is lost in the environment in the form of heat.

That is why lower trophic level always contain more energy than next higher trophic level, and base of pyramid is broad and apex is narrow and hence pyramid of energy is always upright.

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Que~~s~~ = 17

Spermatogenesis

Oogenesis

(1.) The process of formation of sperms from spermatogonia is called spermatogenesis.

(1.) The process of formation of ovum from oogonia is called oogenesis.

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(2.) This process starts at puberty and sustain throughout life.

(2.) This process starts at embryonic stage of foetus and terminate after certain years of life.

(3.) This process leads to formation of four sperms from single spermatogonia.

(3.) In this process, single ovum formed from single oogonia.

19 + 3 = 22



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(4.) Spermatogenesis is a continuous process that is, sperms continuously formed from spermatogonia without any hindrance.

(4.) In oogenesis, process is stopped at two levels, first during meiosis I and during meiosis II. Second

(5.) It occurs in males

(5.) It occurs in females.

Ques = 18

Mendel's law of independent assortment states that in ~~dihybrid~~ dihybrid cross, when two pairs of characters are crossed in hybrid then segregation of one pair of character is independent of other pair of character.



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This can be understood with the example of cross between round yellow seeds with wrinkled green seeds.

In this, two characters, seed colour (yellow and green) and seed shape (round & wrinkled) are taken.

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(Round, yellow) $RRYY$ x $rryy$ (green, wrinkled)

(RY) (ry) → Gametes

$RrYy$ → F₁ generation
All Round & Yellow seeds.

selfing
↓
 $RrYy$ x $RrYy$

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Round Yellow Wrinkled green Round green Yellow wrinkled

	RY	Rxy	Ry	Yxr
RY	$RRYY$	$RxYy$	$RRYy$	$RxYY$
Rxy	$RxYy$	$rxyy$	$Rxyy$	$RxYy$
Ry	$RRYy$	$Rxyy$	$RRyy$	$Rxyy$
Yxr	$RxYY$	$rxYy$	$RxYy$	$rxYY$

↓
F₂-generation

Through the checker board it is clear that :-

- Round Yellow = 9
- Round green = 3
- Yellow wrinkled = 3
- Wrinkled green = 1

Phenotypic Ratio = 9:3:3:1

Genotypic Ratio = 1:2:1:2:4:2:1:2:1

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Then according to law of independent assortment one pair of character that is seed shape segregate independently from another pair of character that is seed colour. No intermixing (blending) is seen.

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(ii) Tumour :-

Normal cells have a property called 'contact inhibition' by virtue of which contact with neighbouring cells inhibit their uncontrolled growth. But cancerous cells lost this property and just continue to divide to give rise to mass of cells called 'tumours'.

There are two types of tumour :-

- (1) Benign Tumour
- (2) Malignant Tumour



Malignant Tumour is more dangerous as it just continue to divide and reaches distant places in body and start new tumour there.

(ii) Detection :-

Cancer can be detect by various method such as (1) Biopsy, histolytical

In this, a piece of suspected tissue is cut into thin sections and strained and then study from microscope.

(2) CT [computed tomography]

In this, X-rays create a three-dimensional picture of internal organs to study cancerous cells.

(3) MRI [magnetic resource imaging]

In this, non-ionising radiations and strong magnetic field is used to study cancerous cells.



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(iii) Causes :-

There are various physical, chemical and biological causes of cancer.

Like Physical \Rightarrow UV rays, X-rays, gamma rays are causes for skin cancer.

Biological \Rightarrow ~~Logo~~ Oncogenic viruses contains oncogenes responsible for cancer.

Chemical \Rightarrow Substances like tobacco contains cancerous products, responsible for lung cancer.

(iv) Treatment :-

Treatment of cancer involves surgery, radiotherapy, immunotherapy and chemotherapy.

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Now-a-days combination of surgery, radiotherapy and chemotherapy is used to treat cancer. Although there are some side effects of treatment of cancer exist like hair loss, anemia.

Ques = 20

Recombinant DNA technology contains various steps, like
(1) Isolation of DNA :-

This is done by enzymes like cellulase, chitinase etc and chilled ethanol. Precipitated DNA is removed by spooling.

(2) Using Restriction Enzyme :-

By this enzyme, DNA is cut into smaller fragments creating many fragments of single DNA.



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(3.) Isolation of DNA fragments :-

Isolation and separation of DNA fragments is done with the help of Gel electrophoresis using Agarose Gel.

(4.) Amplification of gene of interest :-

Using PCR technique, multiple copies of gene of interest is synthesised in vitro.

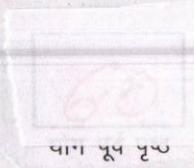
(5.) Joining of gene of interest with vector :-

This is done with the help of DNA ligase enzyme which results into the formation of λ -DNA.

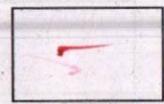
(6.) Transfer into competent Host :-

λ -DNA is then transfer to competent host using various techniques like

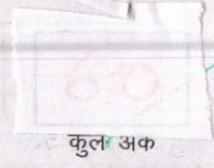
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कुल अंक



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gene gun, microinjection etc.

(7.) Culturing the host :-

To obtain the desired product in large quantity, bioreactors are used to culture the host in optimum conditions required for the desired product.

(8.) Downstream processing :-

This involves purification and separation and formulation with suitable preservatives before dispatching to market.

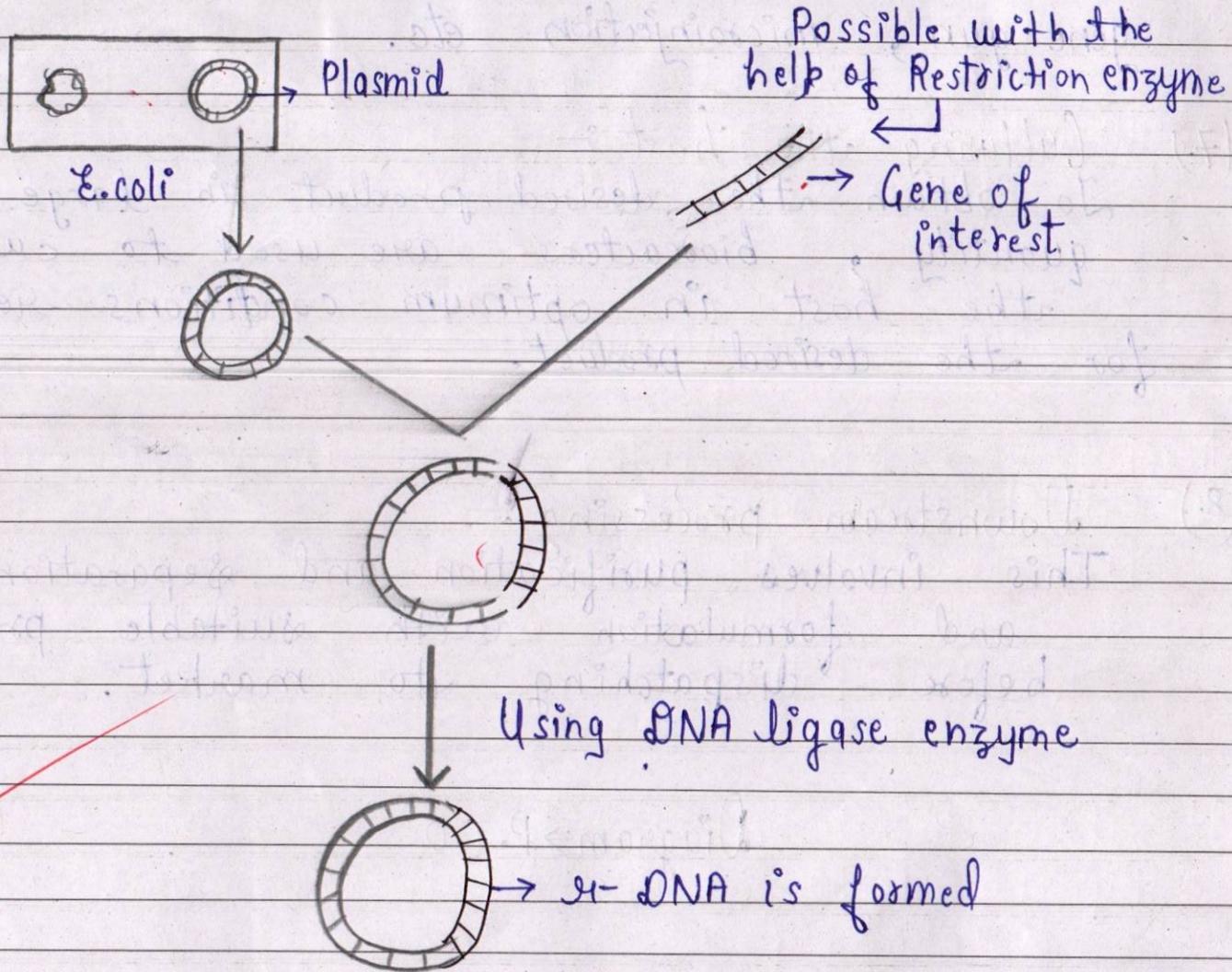
Diagram → P.T.O

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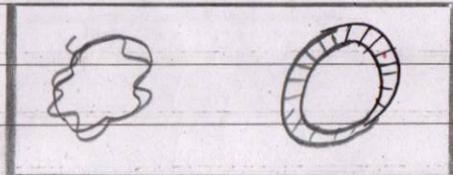


18

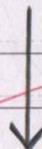
$$60 + 4 = 64$$



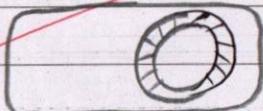
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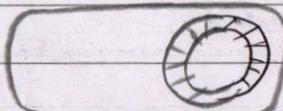
E. coli (Host)



Multiplies



E. coli



E. coli

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