



माध्यमिक शिक्षा मण्डल, मध्यप्रदेश, भोपाल

24^व वार्षिक

वर्ष - 2019

परीक्षार्थी द्वारा भरा जावे।

परीक्षा का विषय 231 विषय कोड 231 माध्यम 231

Biology

स मिलाकर लगायें

परिक्षार्थी का रोल नम्बर

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BOARD: माध्यमिक शिक्षा

उदाहरण

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क :- पूरक उत्तर पुस्तिकाओं की संख्या अंकों में 02 शब्दों में One

ख :- परीक्षार्थी का कक्ष क्रमांक 03

ग :- परीक्षा का दिनांक 18 03 2019

परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक हायर सेकेण्डरी परीक्षा केन्द्र क्रमांक-142094

पर्यवेक्षक का नाम एवं हस्ताक्षर Chhaya Srivastava केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष के हस्ताक्षर Dr. K. K. Singh

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे ↓

प्रमाणित किया जाता है कि मूल्यांकन के समय पूरक उत्तर पुस्तिकाओं की संख्या उपरोक्तानुसार सही पाई हो। लो क्राफ्ट स्टीकर क्षतिग्रस्त नहीं पाया गया तथा 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।

उप मुख्य परीक्षक का नाम Dr. K. K. Singh त मुद्रा Dr. K. K. Singh

प्रश्न क्रमांक	केवल परीक्षक द्वारा भेजे प्रश्न क्रमांक के सम्मुख प्राप्तांकों	पृष्ठ क्रमांक	प्र	करें।
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परीक्षार्थी द्वारा भरा जावे

केन्द्राध्यक्ष/सहायक केन्द्राध्यक्ष एवं परीक्षक द्वारा भरा जावे

परीक्षक एवं उपमुख्य परीक्षक द्वारा भरा जावे

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Question - 1

Fillups

Ans (i)

Clones

Ans (ii)

Thomas Hunt Morgan

Ans (iii)

Single Cell Protein (SCP) - by microbes & bacteria.

Ans (iv)

Producers or Autotrophs

Ans (v)

Bacteriophages.

Question - 2

Choose the correct -

Ans (A)

(ii) Nucellus

Ans (B)

(i) 21st

Ans (C)

(ii) Mycorrhiza

Ans (D)

(i) 2

Ans (E)

(i) Azotobacter

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Question-3

One word

(i) Asexual reproduction in *Penicillium* takes place by Conidia.

(ii) By Y-chromosome (Male sex chromosome)

(iii) *Saccharomyces cerevisiae*. (Brewer's yeast)

(iv) Restriction endonuclease.

(v) 0% energy is lost in every energy level in energy flow. Only 10% energy is passed to next level.

Question-4

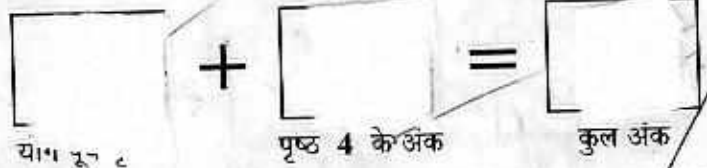
Matching -

"A"

"B"

- | | | |
|------------------------|---|----------------------|
| (a) Vasectomy | - | (5) Male sterility |
| (b) Origin of Universe | - | (2) Big-Bang |
| (c) M. S. Swaminathan | - | (4) Green revolution |

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(A) Palindromic - (2) DNA

(E) Ecosystem - (3) Tansley

SECTION - B

Question - 5

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Self-pollination

Cross-pollination

1) Pollen grains are transferred to stigma of the same flower or to another flower of same plant.

1) Pollen grains are transferred to the stigma of another flower of different plant.

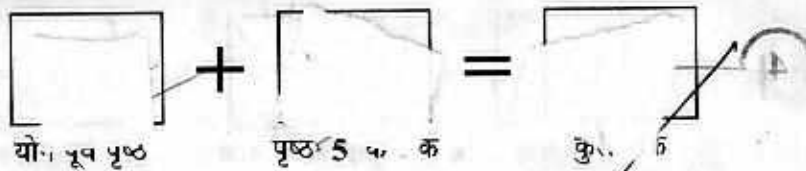
2) Medium is not required in this process.

2) Medium is required in this process.

3) Pollination is sure.

3) Pollination is not sure.

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Question-6

Test tube baby -

~~A baby~~ A baby which is developed from an egg that is fertilised outside the woman's body, and then put back in the woman's body to complete the development is called a test tube baby.

Example - Baby developed from IVF treatment.

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Question-7

Biological

Biochemical Oxygen Demand (BOD) is the amount of oxygen consumed if all the organic matter present in 1 litre of water is oxidised by the microbes or bacteria.

It is the measure of pollution of water. ~~Higher the~~ B

Higher the BOD, more is the water polluted.

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Question-8

Spermatogenesis -

The process of formation of male gamete in humans is called spermatogenesis.

It takes place in the seminiferous tubules of the Testis.

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The male germ cells or spermatogonia lined in the epithelium of seminiferous tubules multiply in number through mitosis division. These cell grow to form primary spermatocyte.

The primary spermatocyte undergo 1st meiosis to form secondary spermatocytes which are haploid. These secondary spermatocytes in turn undergo second 2nd meiosis to give 4 spermatids. But these spermatids are non-motile. The process spermiogenesis takes place in these cells to form spermatozoa.

LH (Luteinising Stimulatory

hormone) & FSH (Follicle Stimulatory hormone) are involved

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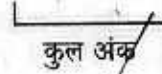
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in regulation of spermatogenesis.

Question - 9 (OR)

Manure

Bio fertilizers

1) These are the organic compounds which are used to increase the fertility of soil.

1) These are the living organisms which are used to increase the nutrient quality of soil.

These are not living objects such as cow dung, dead and decaying organic material, etc.

2) Living organisms are used as biofertilizers such as bacteria & cyanobacteria

3) They do not enrich the soil with nutrients that much.

3) They enrich the soil with nutrients hence increase its quality and texture

Ex - Cow dung, leaves, paper, peels, etc.

Ex - Rhizobium, Anabaena, Nostoc, etc.

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Question - II (OR)

DNA replication:-

DNA replication is the process of formation of new DNA from parental DNA. In this process, information from DNA is transferred to the newly synthesised DNA.

DNA replicates semi-conservatively i.e. in the ~~new~~ new synthesised DNA, one strand is old from parent and one strand is new.

It takes place in following methods-

- 1) The hydrogen bonds between the two strands break in the presence of restriction enzymes or nuclease.
- 2) Both the strands unwind in the presence of helicase enzyme and separate.
- 3) Replication starts at sequence called origin of replication (ori) at which RNA primer attaches itself and help in the functioning of DNA polymerase.



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4) RNA primer brings ~~deoxy ribe~~ deoxyribonucleotides to form the ~~polypeptide cha~~ polynucleotide chain.

5) The opening where replication starts appears as Y shaped or fork // called Replication Fork.

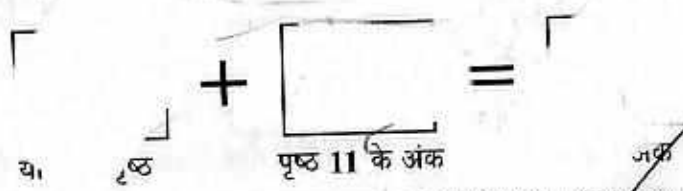
6) New DNA is synthesised from 5' to 3' direction of the new strand.

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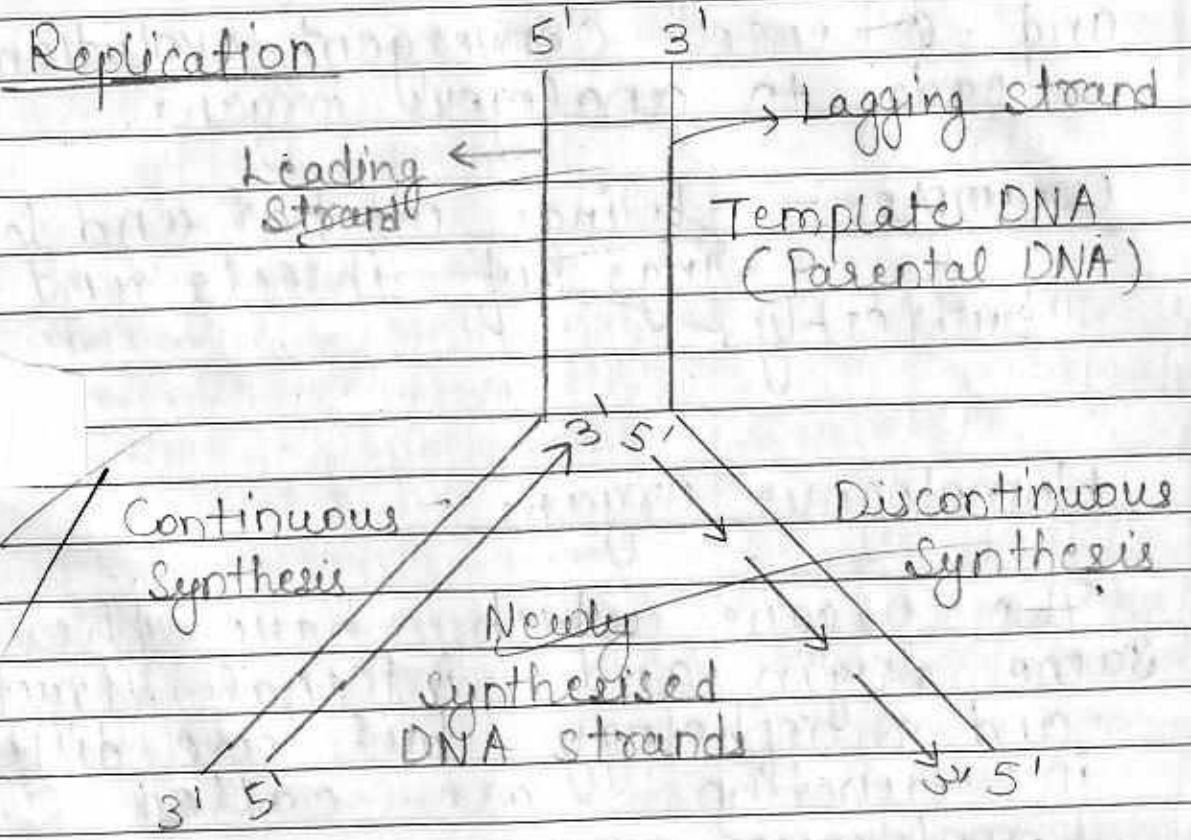
7) At DNA strand with polarity 3' to 5' replication is continuous and at strand with polarity 5' to 3' replication is discontinuous.

8) The separated DNA fragments are later joined by the enzyme DNA ligase.

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Question-12

Analogous Organs -

The organs which are dissimilar in the origin and structure, but are same in the function are called analogous organs.

When convergent evolution occurs in a geographical area, then different species inhabiting the area, adapt to the similar functioning according to the environmental condition.



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and hence convergent evolution leads to analogous organs.

Examples - Wings of bat and birds, wings of insects and butterfly.

Homologous organs -

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The organs which have the same origin and internal structure and morphology but are different in function are called homologous organs.

Whenever divergent evolution occurs in an area, it ~~do~~ leads to homologous organs. As different species migrate to different habitat and adapt themselves to that type of environment, as happened with Darwin's Finches on Galapagos Islands.

Example - Fore limbs of Humans, Horse and whale. They are similar in origin but have dissimilar functions.



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Questions - 13

Innate immunity

Adaptive immunity

1) This type of immunity is present from the time of birth.

1) This type a immunity is acquired later in life.

2) It prevents the entry of pathogens in the body.

2) It fights with the pathogens that already entered into the body.

It is a non-specific type of immunity.

3) It is a pathogen-specific immunity.

4) Memory of first encounter is not found hence all immune responses are same.

4) Memory of first encounter is found hence - it causes primary and secondary responses.

Example - Physical barriers (skin) Physiological barriers. (pH of stomach)

Example - Humoral immunity and cell-mediated immunity.

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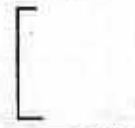
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Question-14

HIV -

HIV stands for Human Immunodeficiency Virus. This virus is the causal agent of AIDS (Acquired Immuno Deficiency Syndrome).

This virus was first reported in 1981 in America where a group used to take drugs intravenously and was suffering from AIDS.

HIV is a group of Retrovirus in which single stranded RNA is found inside the protein coat which continuously changes its form. It causes severe damage to the immune system of the body after entering the body. It attacks on the macrophages and attaches its genetic material with the host's genetic material.

The reverse transcriptase enzyme present in it changes the viral RNA into DNA. The macrophage

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Question - 15Gene cloning -

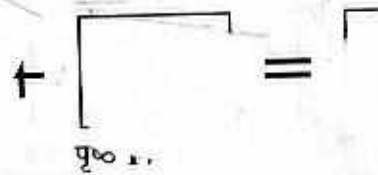
Gene cloning is defined as the procedure in which a desirable sequence of DNA (Gene) is multiplied or replicated in order to increase its quantity and number for the concerned use and application. Clones of DNA are formed in this.

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In this process, following steps are taken -

- 1) The desirable gene or a lin DNA is isolated from the required organism with the help of restriction enzyme.
- 2) Appropriate vector is selected for the transfer of DNA in a host. ex - plasmids.
- 3) Vector such as plasmid DNA, is cut at the required side with the help of restriction enzyme.

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- 4) Alien DNA and plasmid DNA are joined with the help of DNA ligase.
- 5) The new recombinant DNA is transferred into the bacteria or host cell to make its copies.
- 6) As the plasmid has the ability of self-replication, it increases in the numbers by replication and thousands of copies of recombinant DNA are formed.
- 7) The required gene product is isolated from the host cell for its processing.

In this way, many clones of desirable gene can be obtained.

Importance of Gene cloning -

- 1) It is very helpful in producing desirable protein, enzymes & hormones.
- 2) It is useful in gene amplification and PCR.
- 3) It is useful in DNA finger printing



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technology.

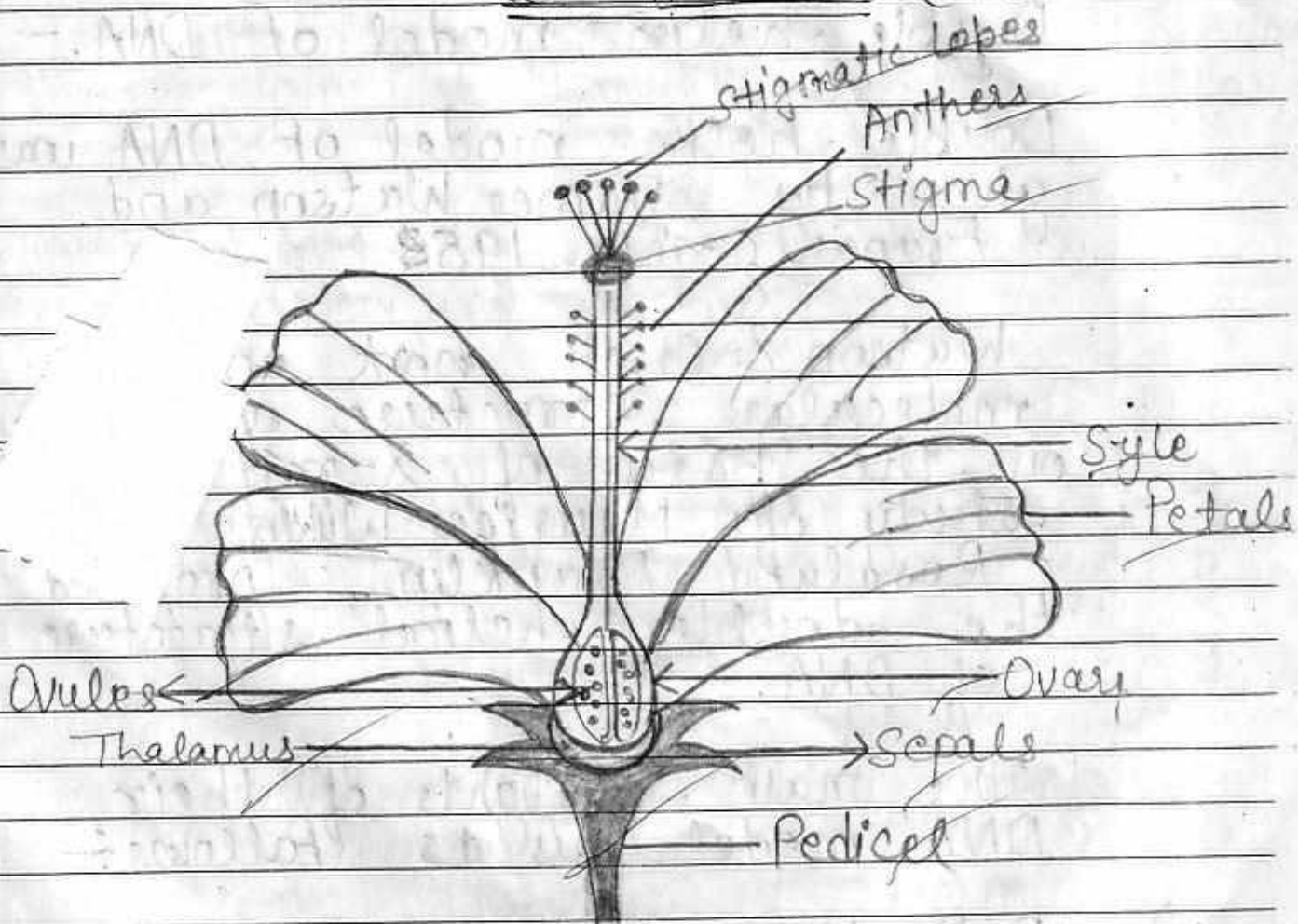
It is useful in the study of genome of an organism.

It is important in genetic research and evolutionary study.

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Question - 16 (OR)



Longitudinal section of a typical flower



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Question-17

Double helix model of DNA. -

Double helix model of DNA was given by James Watson and Francis Crick 1953.

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Watson & Crick work on the molecular structure of DNA and on the basis of X-ray diffraction study of Maurice Wilkins and Rosalind Franklin, proposed the double helical structure of DNA.

The main highlights of their DNA model is as follows:-

- 1) Both the DNA is made up of two long polynucleotide chains which are joined together.
- 2) Both the strands run in anti-parallel direction i.e. if one strand is in 3' → 5' direction, the other will be



in $5' \rightarrow 3'$ direction.

- 3) The nitrogen bases of both the strands are joined through hydrogen bonds.
- 4) The two strands are coiled in right handed fashion and run in opposite direction.
- 5) Adenine makes two H-bonds with Thymine of opposite strand and vice-versa. Guanine makes three H-bonds with cytosine of opposite strand.
- 6) Always a purine binds with pyrimidine and this generates a uniform distance between the two strands of DNA.
- 7) Sugar and phosphate molecule form the backbone of the structure in which nucleotides' nitrogen bases project inside.
- 8) The pitch of helix is 34 \AA and there are roughly 10 bp in each turn. Hence distance between two bp is 3.4 \AA .

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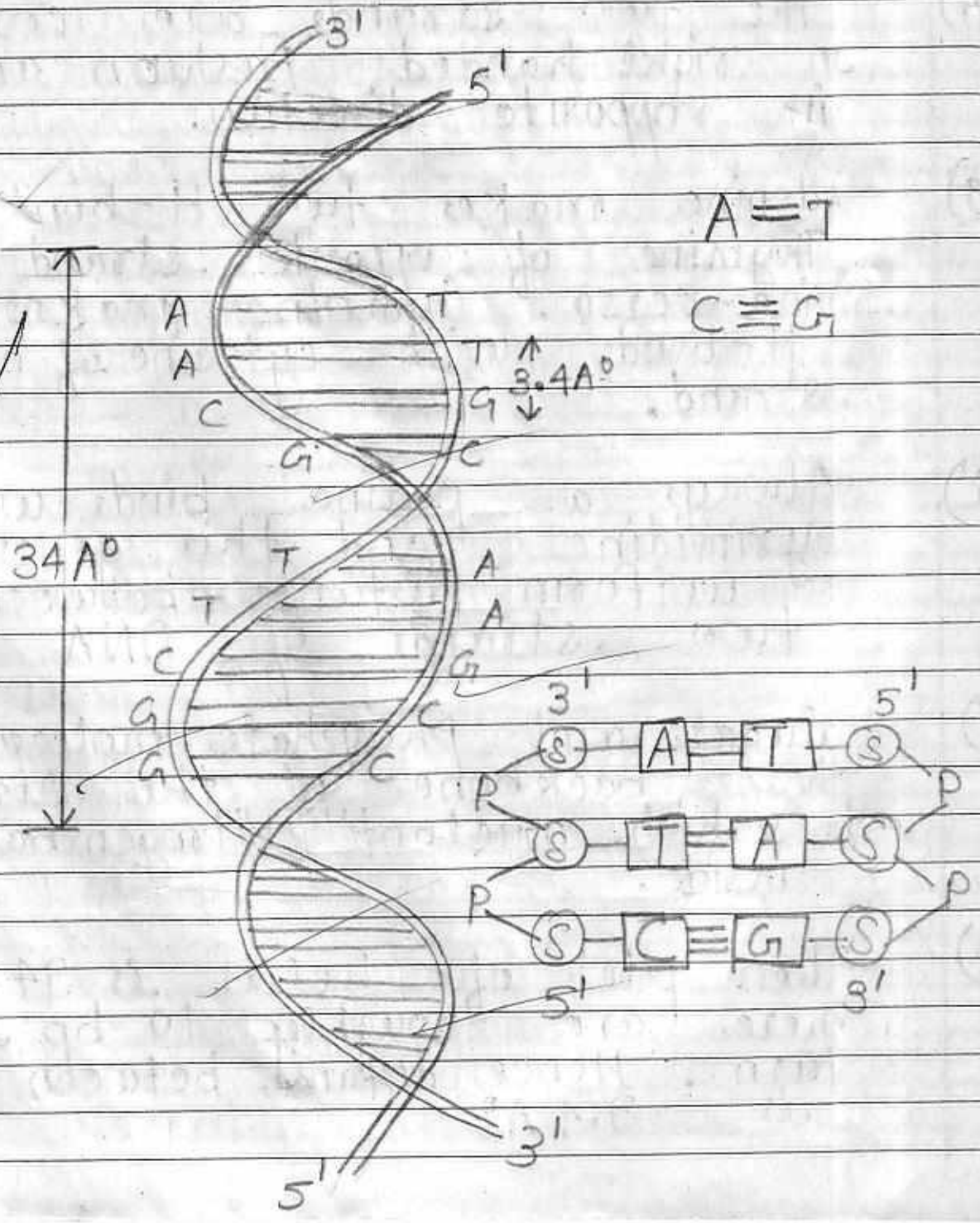


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9) The separation between two chains is approximately 20 \AA

$\leftarrow 20 \text{ \AA} \rightarrow$

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Question-18 (OR)

Ecological Pyramid →

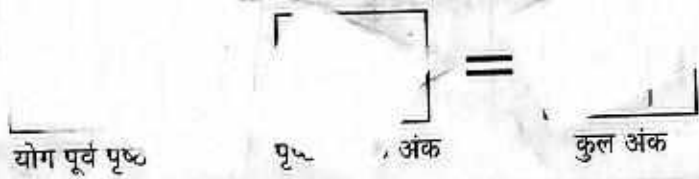
The concept of ecological pyramid was given by Alton.

Ecological pyramids are the representation of the attributes like number of species or organisms, biomass of organisms and energy utilised at each trophic level.

They show the various characteristics of an ecosystem and relation between its components. They can be of different kind according to the type of ecosystem concerned.

In the base of pyramid, always producers are shown and further levels are occupied by primary, secondary and tertiary consumers' trophic level.

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Types of Pyramid -

There are - basically 3 types of pyramids

(1) Pyramid of Number -

It shows the number of individuals available, at each successive trophic level.

In case of grassland ecosystem, pyramid of number is of upright type.

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	No. of individuals
Tertiary Consumers	100
Secondary Consumers	440
Primary Consumers	700
Producers	1000



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परीक्षा का विषय

विषय कोड

परीक्षा का माध्यम

परीक्षा का दिनांक

18/09/19

Biology



परीक्षा का नाम एवं परीक्षा केन्द्र क्रमांक की मुद्रा
 हायर सेकेण्डरी परीक्षा
 केन्द्र क्रमांक-14209A
 पर्यवेक्षक का नाम एवं हस्ताक्षर
 Chhaya Sharma
 प्राध्यापक / सहायक केन्द्राध्यक्ष के हस्ताक्षर

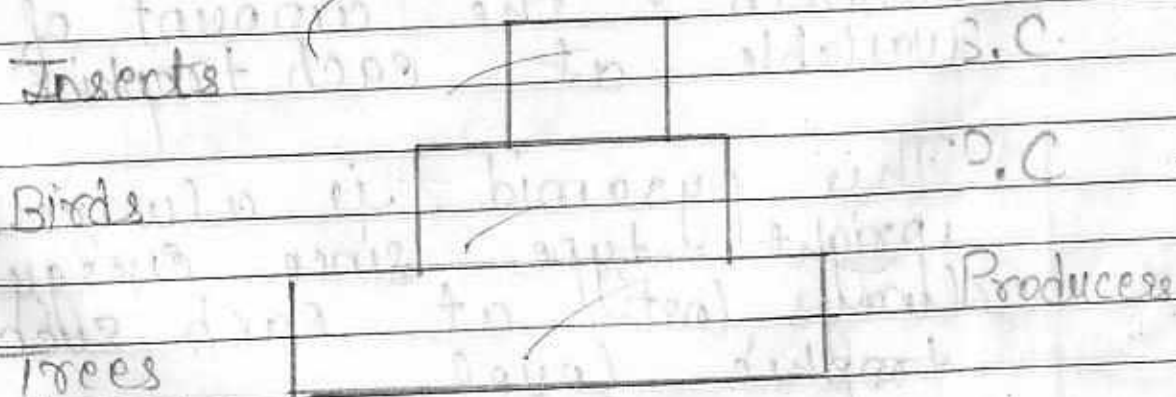
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मुख्य उत्तर पुस्तिका के अंतिम पृष्ठ क्रमांक.....

(2) Pyramid of Biomass

It shows the biomass or living weight of the organisms available at each trophic level.

The pyramid of biomass in a ~~pond~~ tree ecosystem ~~phytoplankton~~ is erect or upright

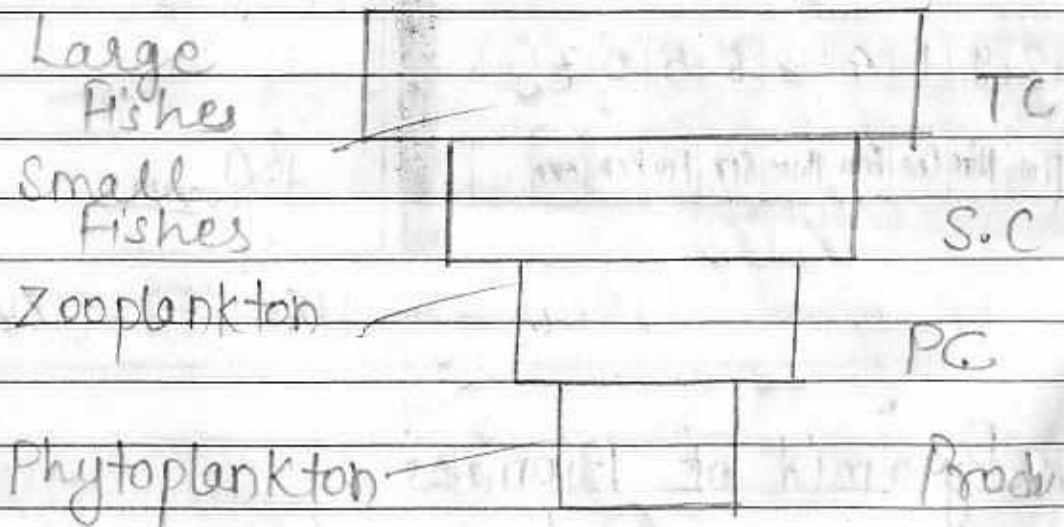


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Pyramid of biomass in an ocean is inverted type



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(3) Pyramid of Energy -

~~This~~ This pyramid is ~~always~~ of

This pyramid shows the relationship between the amount of energy available at each trophic level.

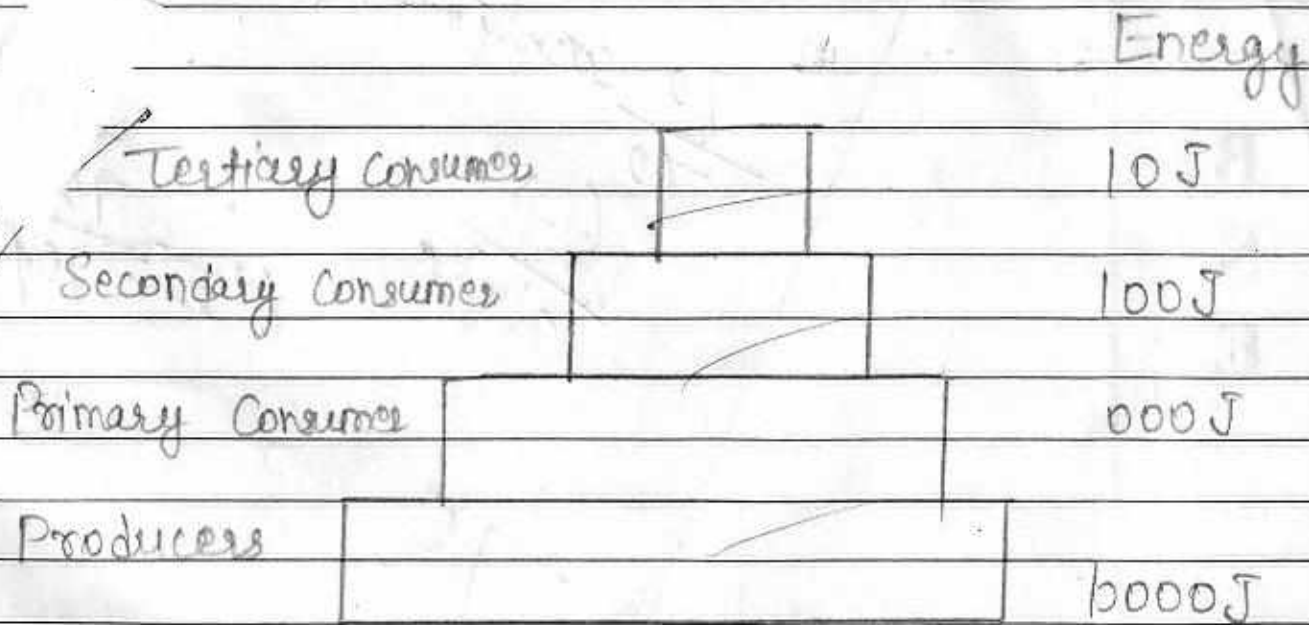
This pyramid is always of upright type since energy is always lost at each successive trophic level.



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According of Lindmann's 10% energy law, on 10% energy is passed to next trophic level & 90% energy is lost.

Ex-

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↑
1000000 J of sunlight

An ideal pyramid of energy