



श्री सत्य साई महिला महाविद्यालय, भोपाल
Sri Sathya Sai College for Women, Bhopal
An Autonomous College affiliated to Barkatullah University, Bhopal
NAAC द्वारा 'ए' ग्रेड प्राप्त/ Accredited 'A' Grade by NAAC

CC

क्रमांक /S.No.

सतत् मूल्यांकन उत्तर पुस्तिका / CCE ANSWER BOOK

का नाम
of Examination CCE-II BSc Final Year

Zoology प्रश्न-पत्र
Paper 1 & 2

17/2/23 दिन
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एक उत्तर पुस्तिकाओं की संख्या
Supplementary Answer Books

एक उत्तर पुस्तिकाओं के क्रमांक
of Supplementary Answer Books

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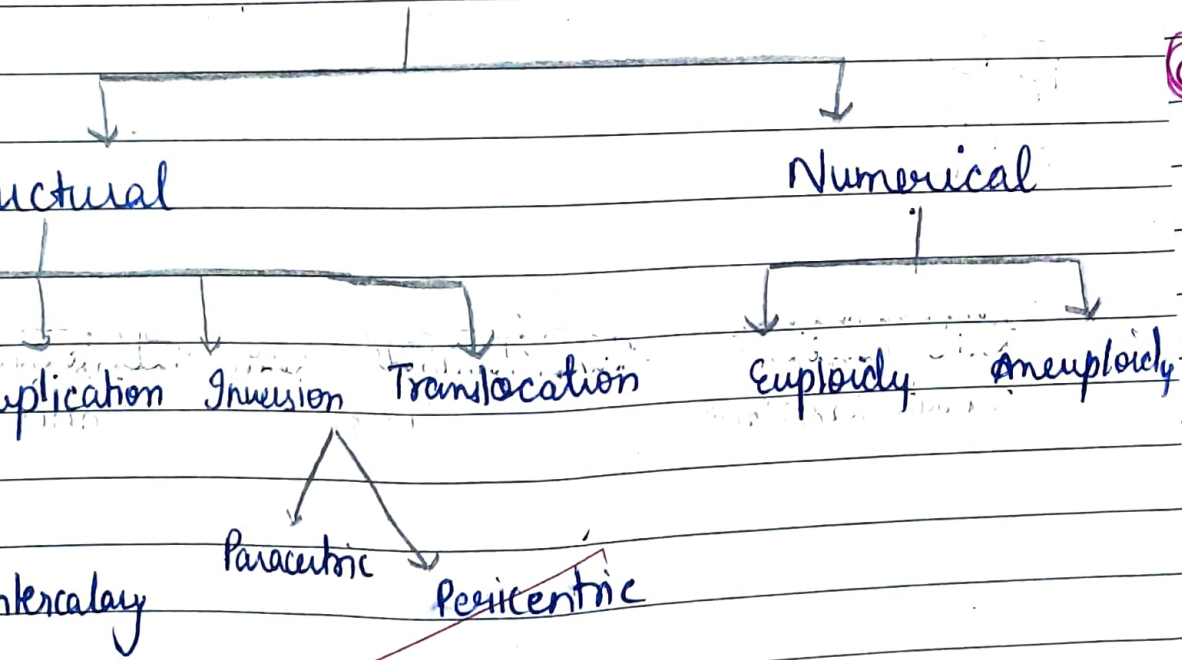
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Section - A

Structural chromosomal Aberration

The genetic changes that are seen in the chromosome due to physical or chemical changes and the results in the change in the structure of chromosome are called structural chromosomal aberrations.

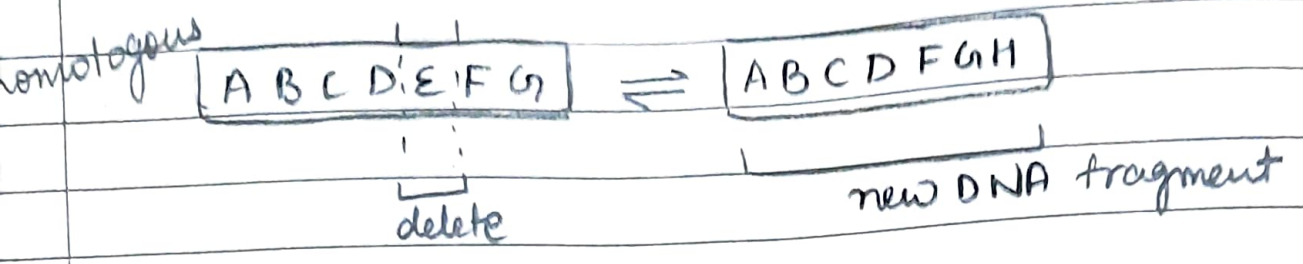
Chromosomal aberrations



The structural aberrations are of the 4 types:-

1) Deletion

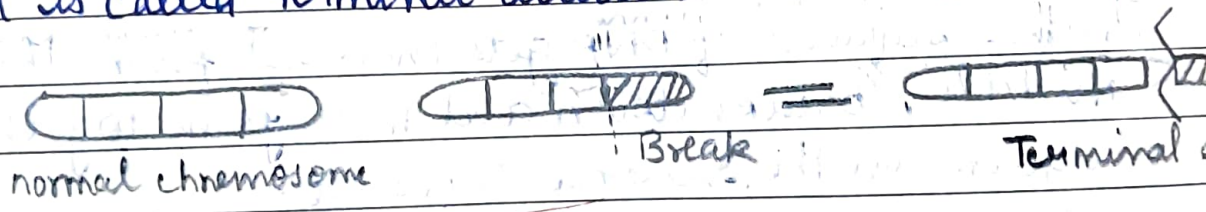
The deletion of any segment of DNA in a homologous chromosome is called deletion.



Types of Deletion

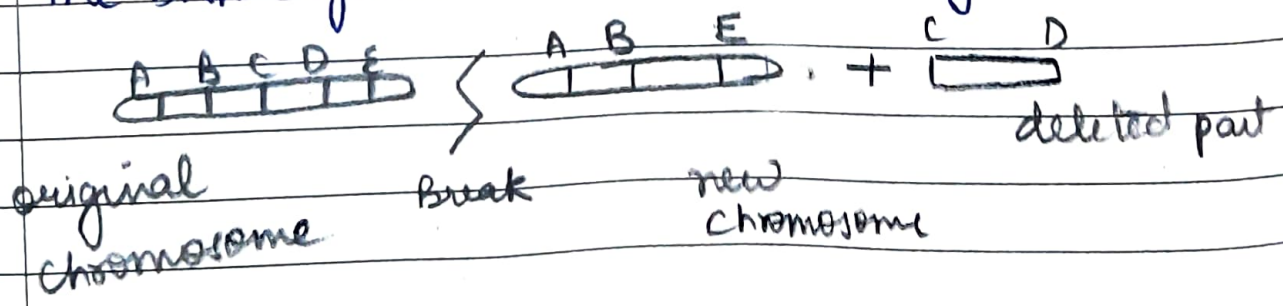
a) Terminal

If the gene or DNA segment is deleted from the terminal end is called terminal deletion



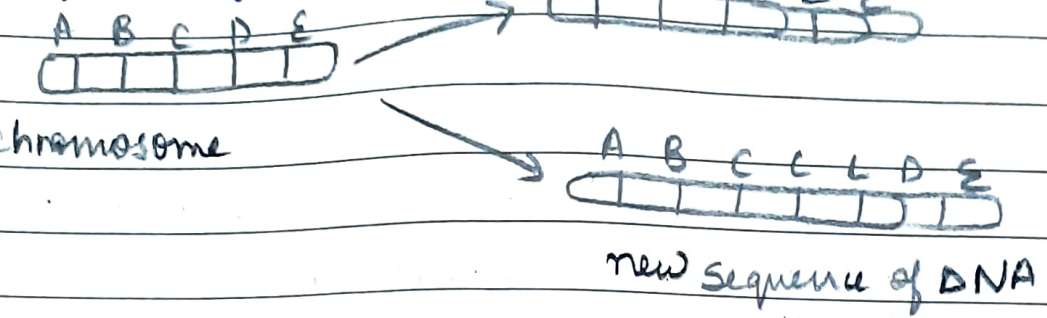
b) Intercalary

If the gene or DNA segment is deleted from in-between the DNA segment is called Intercalary deletion.



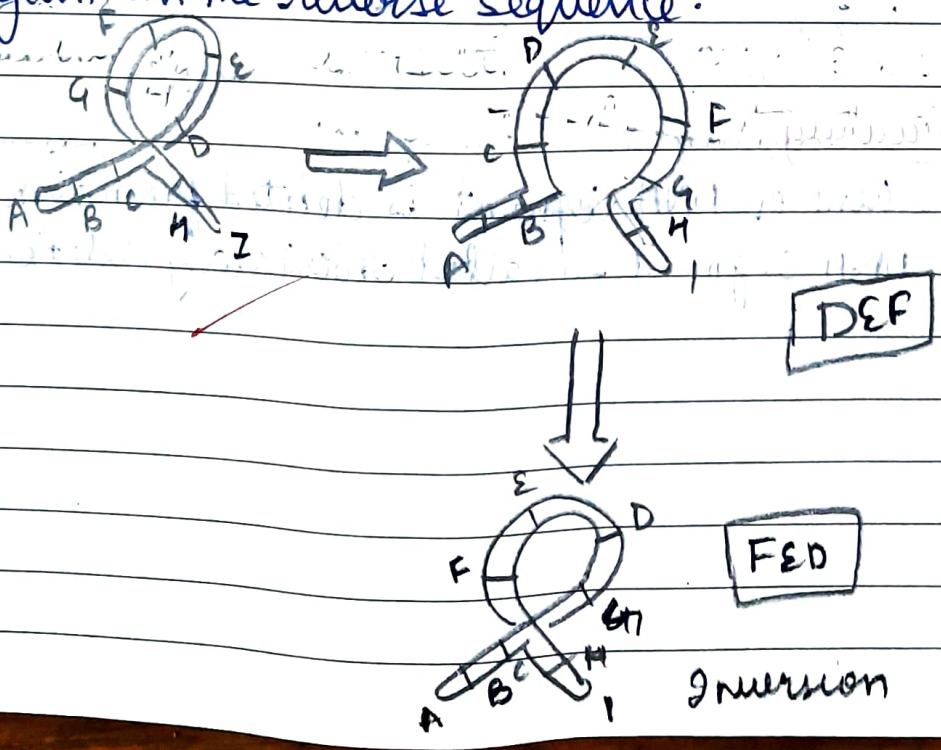
Duplication

The addition of a single gene or a segment of DNA that duplicates itself and thus the whole sequence of DNA changes:



Inversion

In this sequence of DNA gets inverted from the middle, breaks down and then joins together again, in the reverse sequence.



It is of 2 types:-

Paracentric Inversion

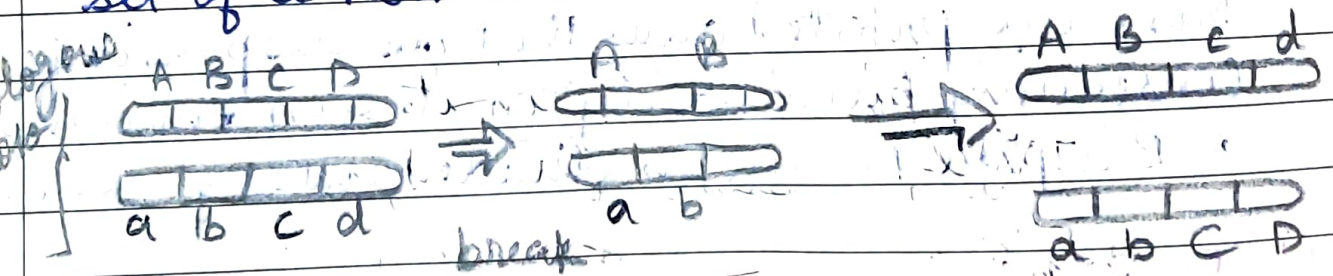
This involves a 180° rotation and gets split in between and is attached in the reverse order. In this centromere is included in the inverted segment.

Pericentric Inversion

Here also 180° rotation takes place and centromere is not included in the inverted sphere.

Translocation

This is a change in the gene or a segment of DNA from 1 homologous set of chromosomes to another set of a non-sister chromatids.



(2)

Biosphere Reserves

The conservation of Biodiversity is basically done by 2 ways:-

In situ Conservation

This is a type of conservation that where the organism is conserved inside the vicinity of its own environment under the natural & optimum conditions required by it.

It includes

National Parks

Wildlife Sanctuaries

Biosphere Reserves



These are protected areas that are responsible for conserving biodiversity in its own environment.

Biosphere Reserve is divided into 3 zones:-

Core Zone

This is the innermost zone.

Buffer Zone

Human activities are allowed.

Forestry activities are entertained.

Buffer Zone

Limited human activities are allowed.
Educational visits are permitted.

Transition Zone

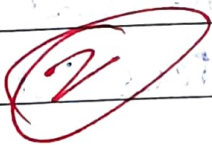
This is the outermost zone.
Forestry activities are allowed.
Research activities takes place

Ex-situ Conservation

This is a kind of conservation where the organism is conserved outside the natural habitat in protected areas under optimum conditions.

Ex: seed banks

zoological Parks



Section-B

Genetic Diseases

The diseases that are caused due to change in the number of genes in the chromosome results in the formation of genetic diseases. Some of the common genetic diseases are as follows: -

Down's Syndrome

- called caused due to trisomy of chromosome 21
- also called mongolism
- Patient suffers from :-
 - Short statured
 - Mental Retardation
 - Round / Flat face.

Turner's Syndrome

- caused due to absence of Y-chromosome
- Patient has only X chromosome and no Y chromosome
- Female Secondary sexual characters ill-developed
- Ovary dysgenesis
- Short heighted

- ③ Klinefelter's Syndrome
- here a person has 2 X chromosome & 1 Y chromosome i.e. (44A + XXY)
 - Secondary sexual characters poorly developed
 - menstruation occurs
 - Testes poorly developed or maybe absent.

- ④ Phenylketonuria
- Genetic disorder in which phenylalanine is not converted to tyrosine
- Excess of phenylalanine get accumulated in blood and is excreted out through the urine.

- ⑤ Alkaptonuria
- here tyrosine is converted to dihydroxyphenylalanine (DOPA).
- Excess amount of DOPA is excreted by urine before it turns to black color & so the color of urine changes to dark brown or black.
 - also called Black-Urine Disease.

Albinism

This occurs due to the absence of the enzyme that is responsible for the formation of melanin pigment. The person suffering from this disease are called Albinos.

They also suffer from "photophobia" due to absence of colour in the iris of the eye. 3

Prawn Culture

Introduction

The breeding, culture & harvesting of prawns for commercial use is termed as prawn culture.

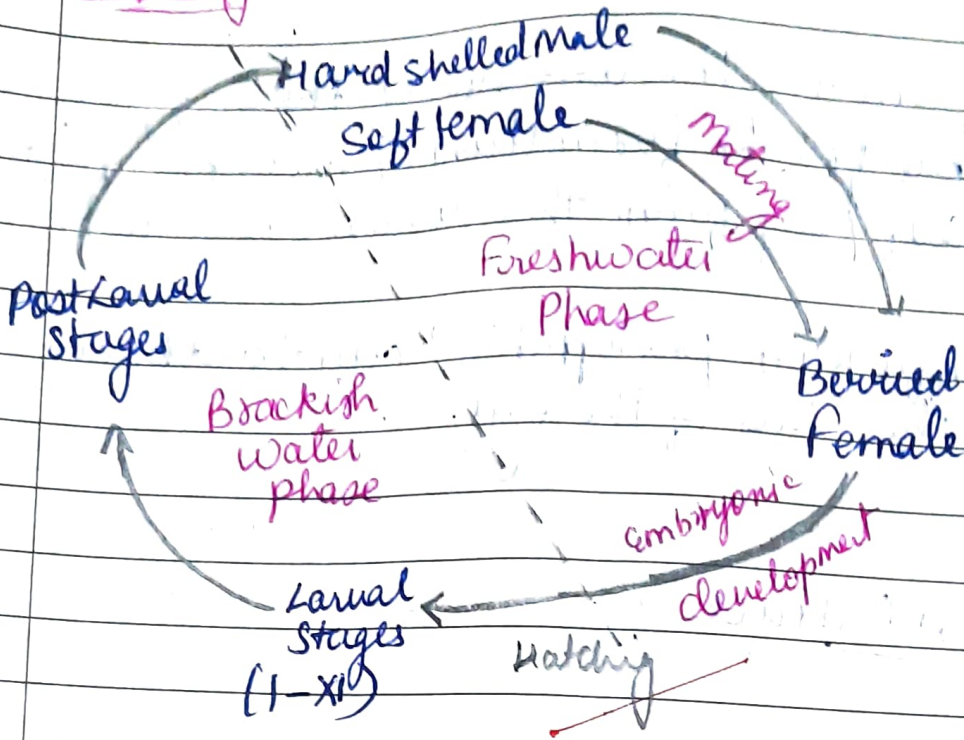
Species Introduction

The topmost variety of species ~~is~~ of commercial prawn is the *Macrobrachium rosenbergii* also called as Giant Prawn. It has the high commercial as well as nutritional value.

Distribution

It is generally found in the East & West Coasts of deltaic region of West Bengal, mid region of Travancore etc.

Life Cycle



Line diagram of Life cycle of Prawn

- The male performs vigorous spasmodic movement of the telson & attract the female for a active response.
- after active response the male releases the sperm on the female gonopore situated in the cephalothoracic region of the ~~pleo~~ abdomen. The fertilized eggs are now transferred to the brood pouches in the pleopods. The female provides timely aeration by shaking its pleopods.

The eggs are oval in shape. bright orange in color initially & gradually to dark grey prior hatching.

Culture Technology

seed

They are basically larvae of prawns that are reared for further growth. they are also called nauplius larvae. Development of larvae starts within the 3 days after fertilisation.

Hatchery Phase

~~After~~ seed are transferred to hatchery phase where the are taken care of the temperature, food-feeding habits, water salinity, optimum pH etc are maintained.

Nursery Phase

The larvae are transferred from hatchery to Nursery phase. All prawns do not grow at the same pace. the males are generally large in size as compared to females. The ideal prawn size seen of male is 175 mm & of female is 150 mm.



I

Site Selection

The site plays an imp role in prawn culture. ~~Rectangular~~ the topography, soil structure, soil texture, pH play an important role in prawn cultivation.

II

Pond

The size & structure of pond is also very imp aspect of this technology. Rectangular ponds are well suited for ideal growth in size & shape.

III

Water

Optimum salinity & pH of about ... should be maintained so as to ease the ideal growth rate of prawns.

IV

Food / Feeding

They grow rapidly \therefore food availability is an important aspect ~~in~~ growth. They could be fed egg yolk, Some parts of world, dry blood powder is also used.

Harvesting

This is an imp aspect after growth.

The prawns are sorted & separated according to the size & shape and also according to the commercial demand.

There are various tools used for harvesting that include.

→ Boats like Rafts, canoe, Motor boats etc.

→ Fisherman use diff nets like the Drag net.
~~AA~~ Rampani net etc.

→ Traps like otter etc are used for prawn harvesting.

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परीक्षा का नाम
Name of Examination BSc III year Bt CCE II

अनुक्रमांक अंकों में (Roll No. in figures)

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Subject Biotechnology

प्रश्न-पत्र
Paper

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Paper I

Short answers:-

- Q1. Penicillin Production :-
- Introduction to Penicillin
 - Antibiotic structure
 - Industrial production

(1) Penicillin was first discovered by Alexander Fleming in 1928 from Penicillium fungi.

Antibiotic are the substances produced by microorganisms which acts against the other

microorganisms. Penicillin is an example of Broad spectrum antibiotic which means one antibiotic acts against wide range of organisms and diseases.

ii) Structure - Antibiotics are differentiated on the basis of side groups attached to the amino acid chains.

- Penicillin has a beta-lactam ring present in structure which is responsible for antibiotic activity. It acts against gram positive bacteria & inhibits cell wall synthesis.

i) Industrial production :- Penicillin is produced by upstream & downstream process. It includes fermentation and recovery of antibiotic.

Fed batch culture of P. chrysogenum

[aerobic condition]

sufficient amount of glucose

Penicillin production appears

addition of precursors

Penicillin is produced from
where the spores are isolated

↓
Spores mixed with barley seeds
and leave it to grow in
fermentous.

- Recovery :- After completion of fermentation
↓ 7 days cycle

Growth phase

1st phase

- mycelium production
is low

- Antibiotic concentration
is also low.

2nd Phase

- mycelium grows
in abundant

- High antibiotic
production

3rd phase

- Antibiotic concⁿ
is dropping down

- Autolysis of
Mycelium

↓
antibiotic is isolated, processed
and sterilized.

↓
Pure form of Antibiotics recovers.

Unit :- Antibiotic is measured in unit
per ml or mg.

Unit/mg/ml

Ans 4. Plant tissue culture is the series of techniques used to culture and grow plants in-vitro.

- Many facilities are required to give the plant to make it grow like
 - Surface medium
 - Nutrition
 - Growth regulators
 - Optimum environmental condition.

The nutritional requirement for plant tissue culture :-

→ Macronutrients and micronutrients

Macronutrients are required in major amount like carbon source (glucose, sucrose, fructose), Nitrogen, Phosphorus, Potassium etc.

Micronutrients are those which requires in less amount like vitamins, minerals, amino acids.

→ Growth regulators - Plants needs hormones and other enzymes, proteins to grow in-vitro like Auxin, Cytokinin and Gibberellins.

Long answer :-

- Q1. → Introduction of Microbial contamination
→ Spoilage of food
→ Factors influencing microbial growth
→ Prevention or Preservation process

- Unintentional introduction of microbes which causes harmful changes and make the substance unfit for use is called as Microbial Contamination.

2 - Spoilage is the aftereffect of microbial contamination where microbes use the food as nutrient source and breakdown ~~the~~ food component, release toxins, enzymes and does the metabolic activity by making food unfit for consumption.

- Microbial contamination can be harmful and beneficial for us. For example :-

- Saccharomyces cerevisiae ferments the food by ~~the~~ breakdown glucose into alcohol.
- Uncooked chicken can produce microbes like Campylobacter which cause food poisoning.

Factors influencing microbial growth.

Intrinsic factors

- These factors are present within the food for microbes to use.
- It includes factors like food pH, moisture content & nutritional content.

- Most of the microbes grow in slightly acidic pH 5-6.
- Microbes grow in acidic condition are called Acidophilic bacteria.
- Mycobacterias grows in extreme acidic or extreme alkaline conditions.

- Presence of free water molecules enhance the growth of microbes when food has moisture.

Extrinsic factors

- These factors include environmental conditions like temperature, humidity & concⁿ of gases.

- Psychophilic microbes grows in $-10-20^{\circ}\text{C}$
Ex. Flavobacterium.

- Mesophilic bacteria grows in $30-45^{\circ}\text{C}$
Ex. Pathogens -- salmonella
Bacillus species.

- Thermophilic bacteria grows in above 45°C
Ex. Lactobacillus,
Clostridium.

- Presence & absence of O_2 can lead to aerobic

- and anaerobic micro

Preservation techniques :-

Food preservation techniques includes three type :- (i) Physical methods
(ii) Chemical methods
(iii) Smoking of food

- Physical method includes process like pasteurization, Canning, Sealing etc.

• Pasteurization is the process of giving heat for or high temperature for short time and low temperature for long time. This denatures the proteins of microbes.

• Canning is also based on heating principle and the cooling the food proceeds by sealing in vacuum.

- Chemical method include salting, pickling, adding preservatives like BHA & BHT (butylated hydroxy anisole & Butylated hydroxy toluene) and chemicals like vinegar and citric acid is used.