ULTIMATE KCET

CRASH COURSE 2026

Biology | Lecture - 01

Microbes in human welfare
Organisms and populations

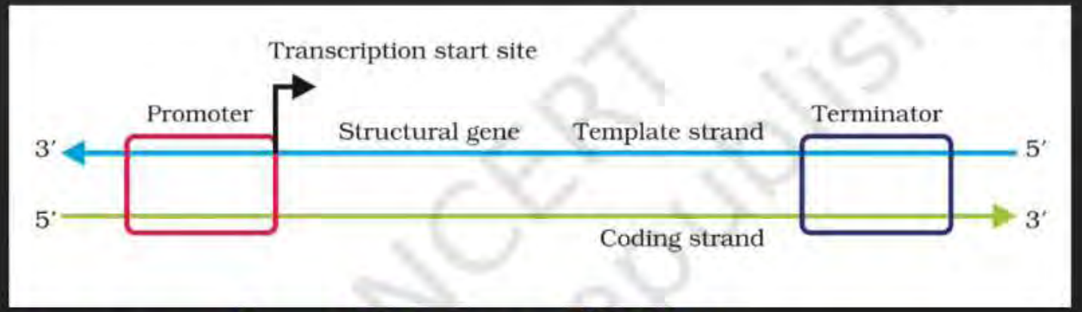
By – Chaitra Ma'am

Topics to be covered

1. Synopsis
2. PYQs
3.
4.

Slide 6: Transcription (The Central Dogma)

- Transcription Unit: Promoter, Structural Gene, Terminator.
- **Strands:**
  - **Template Strand:** 3' → 5' (Read by RNA Pol).
  - **Coding Strand:** 5' → 3' (Matches the mRNA sequence except T is replaced by U).
- **Post-Transcriptional Modifications (Eukaryotes):**
  1. **Splicing:** Removal of Introns (non-coding), joining of Exons.
  2. **Capping:** Methyl guanosine triphosphate at 5' end.
  3. **Tailing:** Adenylate residues (Poly-A tail) at 3' end. - Template independent



Eukaryotic Transcription

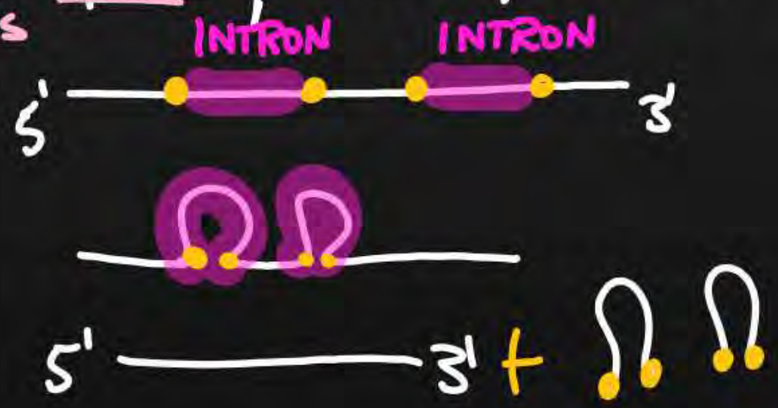
2. Capping
5'- $^{m}G_{PPP}$

3. Tailing
3'- 200-300 bp

Post-Transcription:-

① Splicing - hnRNA / 1° Transcript → Splicing Complex → mRNA

Nucleus



1. Prevention of Coding Conflicts
- If **both strands** acted as templates → would produce **RNA molecules with different sequences**
- **Complementarity ≠ Identical sequences**
- Result: One DNA segment would code for **two different proteins**
- This would **complicate the genetic information transfer machinery**

2. Prevention of Double-Stranded RNA Formation
- If two RNA molecules were produced **simultaneously** from both strands:
  - They would be **complementary to each other**
  - Would form **double-stranded RNA (dsRNA)**
- **Problem with dsRNA:**
  - Prevents RNA from being **translated into protein**
  - Makes transcription a **futile exercise**

Note - Transcription is coupled with translation.
&
no-splicing, tailing, capping
Transcriptn & Translatn happen in cytoplasm only

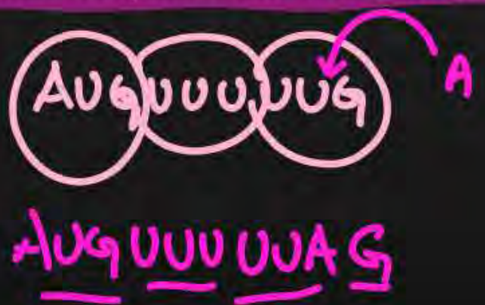
George Gammow – 64 codons
Ochoa → polynucleotide phosphorylase.

The salient features of genetic code are as follows:
(i) The codon is triplet. 61 codons code for amino acids and 3 codons do not code for any amino acids, hence they function as stop codons. UAA, UAG, UGA
(ii) Some amino acids are coded by more than one codon, hence the code is degenerate. Except Trp - UGG
(iii) The codon is read in mRNA in a contiguous fashion. There are no punctuations.
(iv) The code is nearly universal: for example, from bacteria to human UUU would code for Phenylalanine (phe). Some exceptions to this rule have been found in mitochondrial codons, and in some protozoans.
(v) AUG has dual functions. It codes for Methionine (met) , and it also act as initiator codon.
(vi) UAA, UAG, UGA are stop terminator codons.

Frameshift Mutations (Insertion or Deletion)

These occur when one or more bases are added to or removed from the DNA sequence.

- **Mechanism:** Because the genetic code is read in contiguous triplets (codons) without punctuation, any addition or removal of bases (not in multiples of three) shifts the entire "reading frame" from that point onwards.
- **The "RAM HAS RED CAP" Analogy (from NCERT):**
- **Original:** RAM HAS RED CAP.
- **Insertion of 'B':** RAM HAS **B**RE DCA P (The meaning of all subsequent "words" is lost).
- **Insertion of 'BIG':** RAM HAS **BIG** RED CAP (The reading frame remains the same; only one new "word" or amino acid is added).
- **Conclusion:** Insertion or deletion of **three (or multiples of three) bases** inserts or deletes one or more amino acids but **does not alter the reading frame** for the rest of the protein.



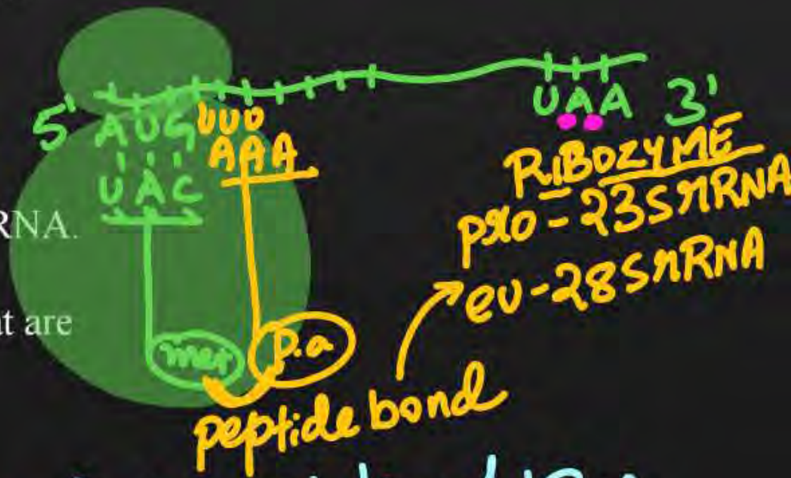
→ Cytoplasm

Translation – The Protein Factory

Translation is the process of polymerizing amino acids into a polypeptide chain based on the mRNA sequence.

- **The Machinery (Ribosome):** * Consists of structural RNAs and about 80 different proteins.
- **Small Subunit:** Binds to mRNA to initiate translation.
- **Large Subunit:** Contains two sites for tRNA binding to facilitate peptide bond formation.
- **Ribozyme:** In bacteria, the **23S rRNA** acts as a catalyst (enzyme) for peptide bond formation.
- **Aminoacylation (Charging of tRNA):** Amino acids are activated using ATP and linked to their specific tRNA. This is energetically required for peptide bond formation.
- **Untranslated Regions (UTRs):** Sequences on mRNA (before the start codon and after the stop codon) that are not translated but are essential for efficient translation.
- **Steps:** 1. **Initiation:** Ribosome binds to the **AUG** (start codon) recognized by the initiator tRNA.
2. **Elongation:** tRNAs sequentially bring amino acids, forming a growing polypeptide chain.
3. **Termination:** A **Release Factor** binds to the stop codon, releasing the completed protein.

1st step

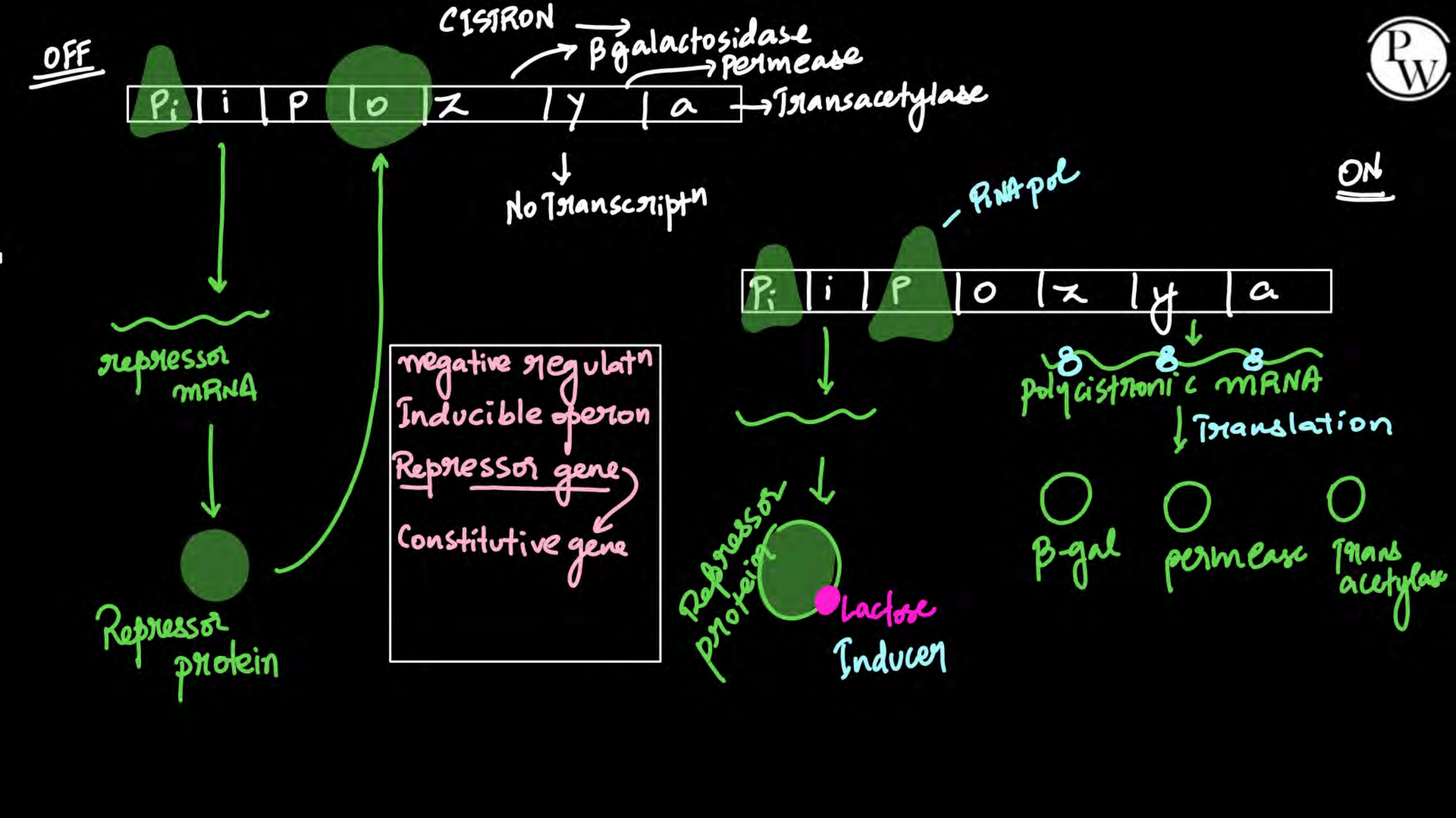


activation

$$A{\cdot}a + ATP \longrightarrow A{\cdot}a\text{-}AMP + PP_i$$

Charging of t-RNA - Aminoacylation of tRNA

$$A{\cdot}a\text{-}AMP + tRNA \longrightarrow t\text{-}RNA\text{-}A{\cdot}a + AMP$$


OFF
CISTRON
β galactosidase
Permease
Transacetylase
Pi i P O Z Y a
No Transcriptn
repressor mRNA
Repressor protein
negative regulatn
Inducible operon
Repressor gene
Constitutive gene
RNA pol
ON
Pi i P O z y a
Polycistronic mRNA
Translation
Repressor protein
Lactose
Inducer
B-gal
permease
Trans acetylase

DNA Fingerprinting – The Basis of Forensic Science

Alec Jeffreys.

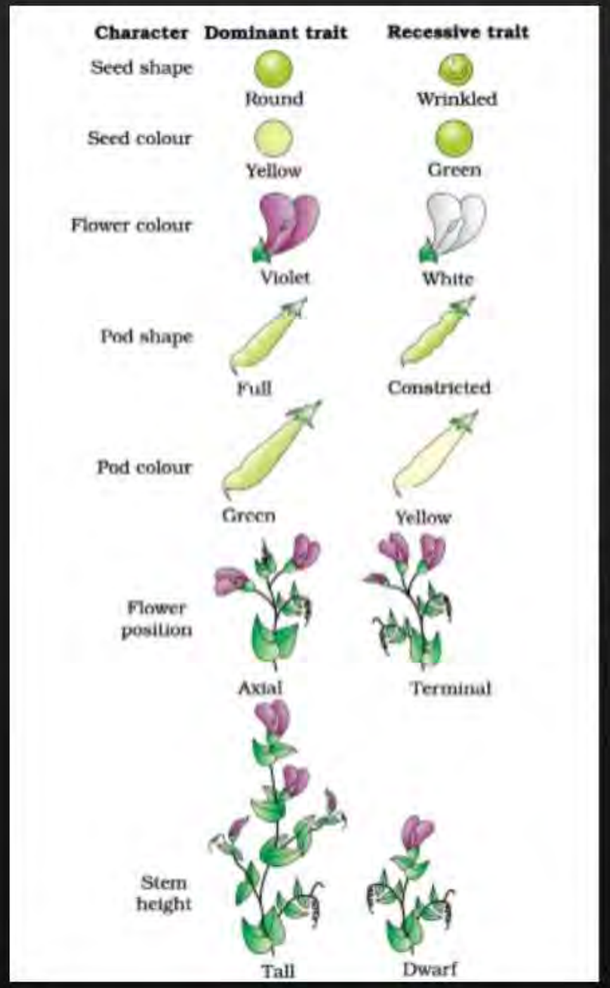
Developed by Alec Jeffreys, this technique identifies individuals based on variations in their DNA.

- **The Principle:** It relies on **polymorphism** in repetitive DNA sequences called **Satellite DNA**.
- **VNTRs (Variable Number of Tandem Repeats):** A type of mini-satellite used as a probe. They vary in size from 0.1 to 20 kb.
- **The Steps (NEET Order):**

1. **Isolation:** Extracting DNA from cells (blood, hair, etc.).
2. **Digestion:** Cutting DNA into fragments using **Restriction Endonucleases**.
3. **Separation:** Using **Electrophoresis** to sort fragments by size.
4. **Blotting:** Transferring DNA to a synthetic membrane (Nitrocellulose/Nylon).
5. **Hybridization:** Using labeled VNTR probes (radioactive) to bind to complementary sequences.
6. **Detection:** Visualizing the pattern using **Autoradiography**.

- **Applications:** Forensic investigations, paternity testing, and determining genetic diversity in populations.

Important topics



S.No.	Characters	Contrasting Traits
1.	Stem height	Tall/dwarf
2.	Flower colour	Violet/white
3.	Flower position	Axial/terminal
4.	Pod shape	Inflated/constricted
5.	Pod colour	Green/yellow
6.	Seed shape	Round/wrinkled
7.	Seed colour	Yellow/green

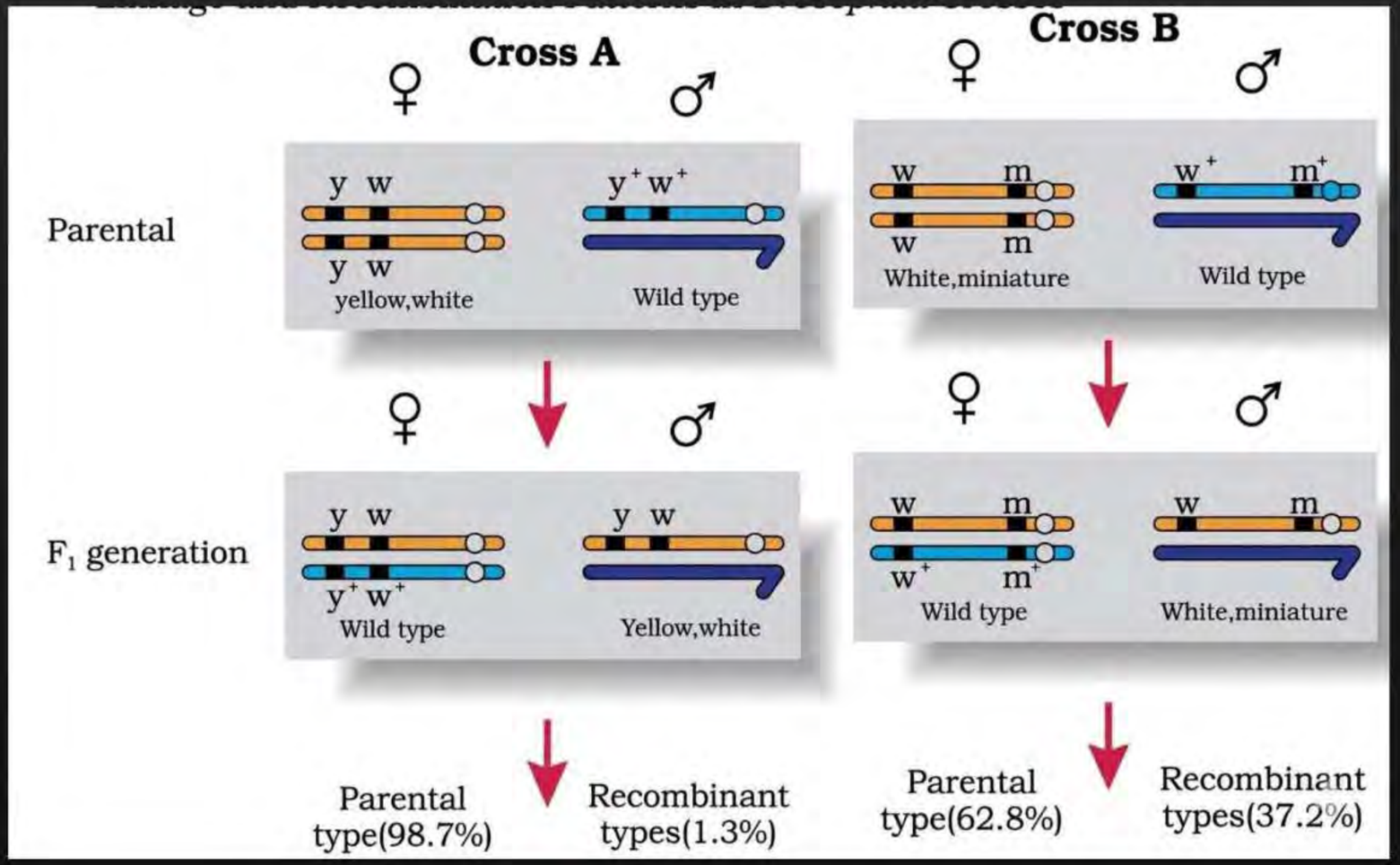
- Laws of independent assortment
- Law of segregation
- Law of dominance

- Ratio. monohybrid cross. 3:1
- dihybrid cross 9:3:3:1
- Test cross 1:1

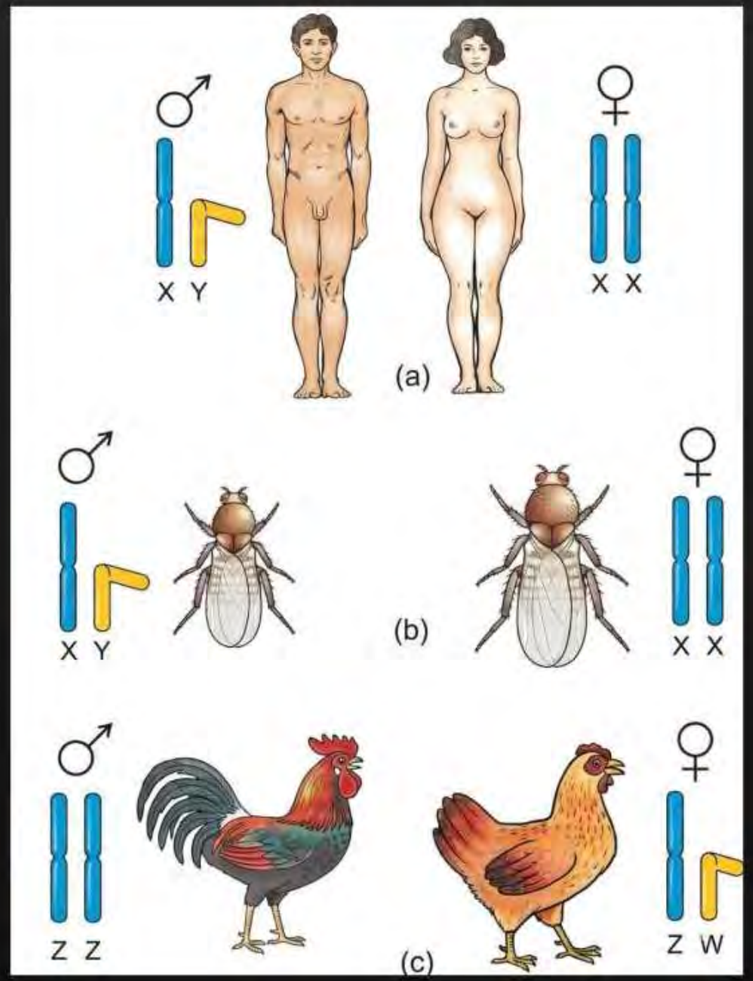
Important topics

- Multiple allelism - ABO blood grouping
- Pleiotropy - PKU, SCA. Starch synthesis gene (B gene)
- Co-dominance - AB blood group
- Polygenic inheritance. Skin colour in humans
- Incomplete dominance Flower Colour in Snapdragon 1:2:1

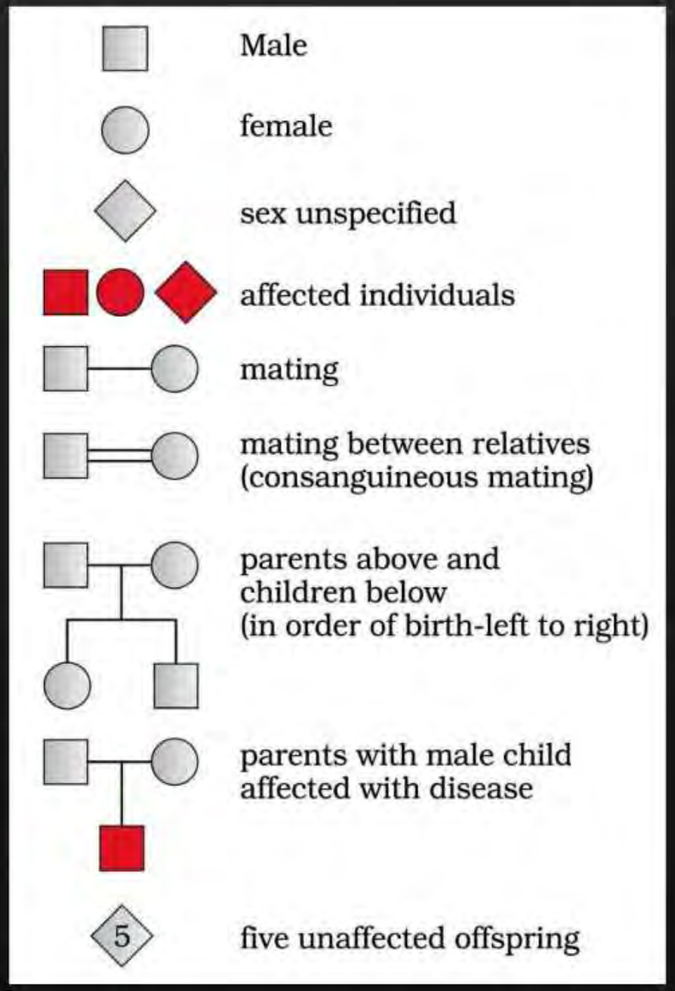
Important topics



Important topics



Important topics



Question

There are 64 codons in the genetic dictionary as

A. there are 3 nonsense codons and 61 sense codons

B. there are 64 different types of t-RNA

C. there are 64 amino acids to be coded

D. genetic code has a triplet nature.

Question

According to the lac-operon concept, which functional unit of the bacterial genetic material is responsible for suppressing the activity of the operator gene in the absence of lactose?

A. Regulator gene

B. Structural gene

C. Promotor gene

D. Repressor protein

Question

A phenomenon where the third base of t-RNA at its 5^' end can pair with a noncomplementary base of m-RNA is called

A universality

B colinearity

C degeneracy

D wobbling

Question

The sequence of events mentioned below are symbolised by alphabets. Choose the correct answer where the alphabets are matched with the processes.

A A= Replication, B= Transformation, C= Transcription, D= Translation

B A= Reverse transcription, B= Replication, C = Transcription, D= Translation

C A= Replication, B= Transcription, C = Translation, D= Transduction

D A= Reverse transcription, B= Translation, C= Transcription, D= Replication

Question

Compare the statements A and B .
Statement A: A monocistronic m RNA can produce several types of polypeptide chains.
Statement B: The terminator codon is present on the mRNA.
Select the correct description.

A. Statement A is wrong and B is correct.

B. Both the statements A and B are correct.

C. Both the statements A and B are wrong.

D. Statement A is correct and B is wrong

Question

Blood stains are found at the site of a murder. If DNA profiling technique is to be used for identifying the criminal, which of the following is ideal for use?

A Leucocytes

B Platelets

C Serum

D Erythrocytes

Question

When DNA replication starts

A the phosphodiester bonds between the adjacent nucleotides break.

B the bonds between the nitrogen base and deoxyribose sugar break.

C the leading strand produces Okazaki fragments.

D the hydrogen bonds between the nucleotides of two strands break

Question

Ribose sugar is present in

A. RNA polymerase and ATP

B. RNA and ATP

C. RNA polymerase, RNA and ATP

D. RNA only

Question

Which one of the following statements is not correct?

A. cysteine is coded by UGU and UGC codons.

B. tyrosine is coded by UAU and UAC codons.

C. UAA codon codes for lysine.

D. UGG codon codes for tryptophan.

Question

The main aim of the human genome project is

A. to introduce new genes into humans

B. to identify and sequence all the genes present in human DNA

C. to develop better techniques for comparing two different human DNA samples

D. to remove disease causing genes from human DNA.

Question

DNA gyrase, the enzyme that participates in the process of DNA replication, is a type of

A. DNA topoisomerase

B. Reverse transcriptase

C. DNA ligase

D. DNA polymerase

Question

Compare the statements A and B .
Statement A : RNA produced during transcription in eukaryotic cells cannot be straight away used in photosynthesis.
Statement B : RNA splicing phenomena helps in the removal of exons.
Choose the correct description.

A. Both the statements A and B are wrong.

B. Both the statements A and B are correct.

C. Statement A is correct and B is wrong.

D. Statement A is wrong and B is correct.

Question

In genetic fingerprinting, the 'probe' refers to

A. a radioactively labelled single stranded DNA molecule

B. a radioactively labelled single stranded RNA molecule

C. a radioactively labelled double stranded RNA molecule

D. a radioactively labelled double stranded DNA molecule.

Question

In genetic code, 61 codons code for 20 different types of amino acids. This is called

A colinearity

B commaless

C degeneracy

D nonambiguity

Question

Which one of the following is correct?

A. Introns are present in mRNA and exons are present in t RNA.

B. Codons are present in mRNA and anticodons in t RNA.

C. Every intron is a set of three terminator codons.

D. Exons are present in eukaryotes while introns are present in prokaryotes.

Question

The term, genetic RNA refers to

A genetic material of RNA viruses

B RNA that carries genetic message

C RNA that helps gene regulation in lac-operon

D RNA present in mitochondria.

Question

The term, 'Southern Blotting' refers to

A transfer of DNA fragments from in vitro cellulose membrane to electrophoretic gel

B attachment of probes to DNA fragments

C transfer of DNA fragments from electrophoretic gel to nitrocellulose sheet

D comparison of DNA fragments from two sources.

Question

Identify the sense codon from the following.

↳ codes for amino acid

A. UGA

B. AUG ✓

C. UAG

D. UAA

Question

The lac operon is turned on when allolactose molecules bind to

A promoter site

B operator site — off

C mRNA

D repressor protein. ✓

Question

3′ AAA TGC GCG ATA 5′ is the sequence of nucleotides on a gene; after transcription the m RNA formed against it and the sequence of bases in the corresponding binding anticodons will be

A. 5′ UUU ACG CGC UAU 3′ and 3′ AAA-UGC-GCG-AUA 5′

B. 5′ UAU CGC GCA UUU 3′ and 3′ AUA-GCG-CGU-AAA 5′

C. 5′ UUU ACC TUG UAU 3′ and 3′ AAA-UGG-UAC-AUA 5′

D. 5' UAU GUT CCA UUU 3' and 3' AUA-CAU-GGU-AAA 5′

Question

The most unstable RNA is

A messenger RNA

B soluble RNA

C ribosomal RNA

D heterogeneous nuclear RNA.

Question

The portion of an eukaryotic gene which is transcribed but not translated is

A Exon

B Intron

C Cistron

D codon.

Question

Read the statements A and B and select the correct option.
Statement A: Synthesis of m RNA takes place in $5' - 3'$ direction.
Statement B : Reading of m RNA is always in 3'-5' direction.

A. Both the statements are incorrect

B. Statement A is incorrect, B is correct

C. Statement B is incorrect, A is correct

D. Both the statements A and B are correct

Question

The sequence of nitrogenous bases in one strand of DNA are 3′ TAC GCG ACG 5′. The complementary DNA strand should have

A. 5′ AUG CGC TGC 3′

B. 3′ ATG CGC TGC 5’

C. 5′ UAC GCG ACG 3′

D. 5′ ATG CGC TGC 3'

Question

The result of which of the following reaction experiments carried out by Avery et. al. on Streptococcus pneumoniae has proved conclusively that DNA is the genetic material?

A. Live 'R' strain + DNA from ' S ' strain + RNAase

B. Live 'R' strain + DNA from 'S' strain + DNAase

C. Live 'R' strain + Denatured DNA of 'S' strain + protease

D. Heat killed 'R' strain + DNA from 'S' strain + DNAase

Question

Which of the following events would occur in 'Lac operon' of *E*. coli when the growth medium has high concentration of lactose?

A. The repressor protein attaches to the promoter sequence and derepresses the operator

B. The structural genes fail to produce polycistronic *m* RNA

C. The inducer molecule binds to repressor protein and RNA polymerase binds to promoter sequence

D. The repressor protein binds to RNA polymerase and prevents translation

Question

Statement A : The primary transcript produced in eukaryotes is translated without undergoing any modification or processing.

Statement B : The hnRNA in humans has exons and introns.

A. Statement *B* is correct and statement *A* is wrong

B. Both the statements A and B are correct

C. Statement *A* is correct and statement *B* is wrong

D. Both the statements *A* and *B* are wrong

Question

Some of the steps of DNA fingerprinting are given below. Identify the correct sequence from the options given.

A. Electrophoresis of DNA fragments
B. Hybridisation with DNA probe
C. Digestion of DNA by RENs
D. Autoradiography
E. Blotting of DNA fragments to nitrocellulose membrane

A C – A – B – E – D

B C – A – E – B – D

C A – E – C – B – D

D A – C – E – D – B

Question

RNA polymerase-I transcribes eukaryotic ribosome which does not consist of

A. 5.8 SrRNA

B. 28 SrRNA

C. 18 SrRNA

D. $5SrRNA$

Question

Match the following

(A)	VNTR	p.	Largest gene
(B)	Introns and exons	q.	DNA fingerprinting
(C)	Dystrophin	r.	Bulk DNA
(D)	Satellite DNA	s.	Splicing

A (A) - r, (B) - s, (C) - p, (D) - q

B (A) -q, (B) -p, (C) -s, (D) -r

A (A) -q, (B) -s, (C) -p, (D) -r

B (A) - s, (B) - p, (C) - q, (D) - r

Question

In a 3.2 Kbp long piece of DNA, 820 adenine bases were found. What would be the number of cytosine bases?

A 780

B 1560

C 740

D 1480

Question

If an inheritable mutation is observed in a population at high frequency, it is referred to as

A sequence annotation

B DNA polymorphism

C Linkage

D expressed sequence tag

Question

In 125 amino acid sequence if the codon for 25^{th} amino acid is mutated to UAA, then

24 A.a

A. a polypeptide of 24 amino acids is formed

B. a polypeptide of 124 amino acids is formed

C. no polypeptides are formed

D. a polypeptide of 25 amino acids is formed

Question

The codon AUG has dual function. It is an initiation codon and also codes for

A Phenylalanine

B Formaldehyde

C Serine

D methionine.

Question

Find the sequence of binding of the following aminoacyl t RNA complexes during translation to m RNA transcribed by a DNA segment having the base sequences 3' TACATGGGTCCG 5'.

5' AUGUACCCAGGC 3'
3' UAC AUG GGU CCG 5'

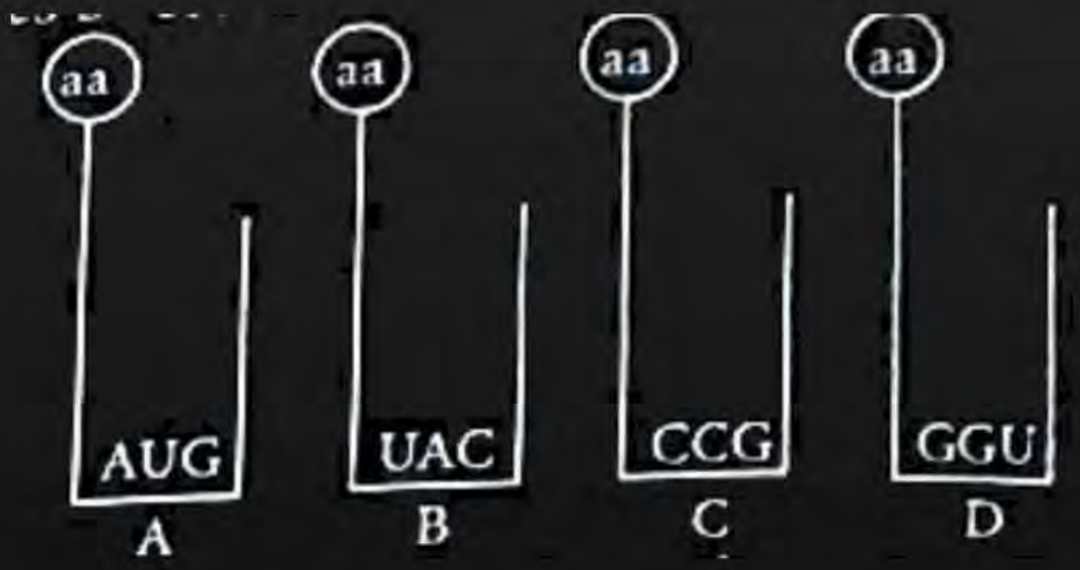
A. A, B, D, C

B. B, A, D, C

C. C, D, B, A

D. D, C, A, B

B A D



Question

E. coli bacteria grew in 15NH4Cl medium for several generations are allowed to grow in "NH4Cl medium. After 2 generations, the bacteria are isolated from the medium and DNA of bacteria centrifuged in CsCl. The result of the density gradient of DNA is

A only hybrid DNA

B both hybrid and heavy DNA

C both heavy and light DNA

D both hybrid and light DNA

Question

The codons UUU and UUC codes for phenylalanine only. This feature of genetic code is called

A comma-less

B non-overlapping

C degenerate

D non-ambiguous.

Question

Read the following statements carefully and choose the correct statements.
(A) In a transcription unit, the promoter is located at the 5' end of coding strand.
(B) The single strand DNA having the polarity 5'→3' is the template strand.
(C) RNA polymerase binds to the operator during transcription.
(D) Single base DNA differences occur in humans are called Single Nucleotide Polymorphism (SNPs).

A Statements A and B

B Statements B and C

C Statements B and D

D Statements A and D

→ 24 chromosomes - 22 auto + X + Y

Fredrick Sanger → machineries → used to sequence human genome

Human Genome Project (HGP) – The "Mega Project"

Launched in 1990 and completed in 2003, this project aimed to sequence the entire human genome (~3 billion base pairs).

- **Methodologies:**
- **Expressed Sequence Tags (ESTs):** Identifying only the genes expressed as RNA.
- **Sequence Annotation:** Sequencing the entire genome (coding and non-coding) and then assigning functions.
- **Technical Tools:** Used specialized vectors like **BAC** (Bacterial Artificial Chromosomes) and **YAC** (Yeast Artificial Chromosomes).
- **Salient Features (High-Yield):**
- The human genome contains **3164.7 million base pairs**.
- The total number of genes is estimated at **30,000** (much lower than the initial guess of 1.4 lakh).
- **Largest gene:** Dystrophin (2.4 million bases).
- **99.9%** of nucleotide bases are identical in all humans.
- **Chromosome 1** has the most genes (2968), and the **Y chromosome** has the fewest (231).
- **SNPs (Single Nucleotide Polymorphism):** 1.4 million locations where single-base differences occur.

MICROBES IN HOUSEHOLD PRODUCTS

Fermentation

Curd Formation

- Microbe: **Lactobacillus (LAB)** – Bacteria
- Function: → Lactic acid → milk proteins - Curdle
  - Converts milk → curd
  - Produces **lactic acid**
  - Increases **Vitamin B_{12}**

Fermentation

Product	Microbe	Gas Produced
Idli/Dosa batter	Bacteria	CO_2
Bread	Yeast (Saccharomyces cerevisiae)	CO_2
Toddy	Yeast	Ethanol – 'alcohol'

extracted from flower sap of palm

Cheese Formation

Cheese Type	Microbe	Special Feature
Swiss cheese	Propionibacterium sharmanii	Large holes (CO_2)
Roquefort cheese	Fungi	Distinct flavour

INDUSTRIAL PRODUCTS

A. FERMENTED BEVERAGES

Product	Microbe	Process
Beer/Wine	Yeast	Fermentation
Whisky/Rum	Yeast	Distillation

No distillation

↑ alcohol %

Key Reaction - Fermentation

Glucose → Ethanol + CO_2

B. ANTIBIOTICS

Chain & Florey
Penicillin used

Important Facts -

- First antibiotic: **Penicillin** discovered when Fleming was working with Staphylococcus bacteria!
- Discovered by: **Alexander Fleming**
- Source: **Penicillium notatum** (fungi)
  Ascomycota

🧪 C. CHEMICALS & ENZYMES

Product	Microbe	Use
Citric acid	Aspergillus niger (Fungi (mould))	Food industry
Acetic acid	Acetobacter aceti (Bacteria)	Vinegar
Lactic acid	Lactobacillus (Bacteria)	Dairy
Ethanol	Yeast (Fungi (Asco))	Alcohol
Butyric	Clostridium butylicum (Bacteria)	

🧬 BIOACTIVE MOLECULES (VERY IMPORTANT)

Molecule	Source	Function
Streptokinase	Streptococcus (Bacteria)	Clot buster in MI patients
Cyclosporin A	Trichoderma polysporum (fungi (deutero))	Immunosuppressant
Statins	Monascus purpureus (fungi (Yeast)) ↓	Lower cholesterol

A. PRIMARY TREATMENT

(PHYSICAL)⭐

Process	Purpose
Filtration	Remove debris . floating
Sedimentation	Remove grit
Output	Primary sludge + Effluent

Sedimentation tank

B. SECONDARY TREATMENT

(BIOLOGICAL)

Aerobic heterotrophic microbes

AERATION TANK- Air is pumped → Floc formed

- Microbes form **flocs** (fungi + Bacteria)
- Reduce **BOD** (Biochemical Oxygen Demand)

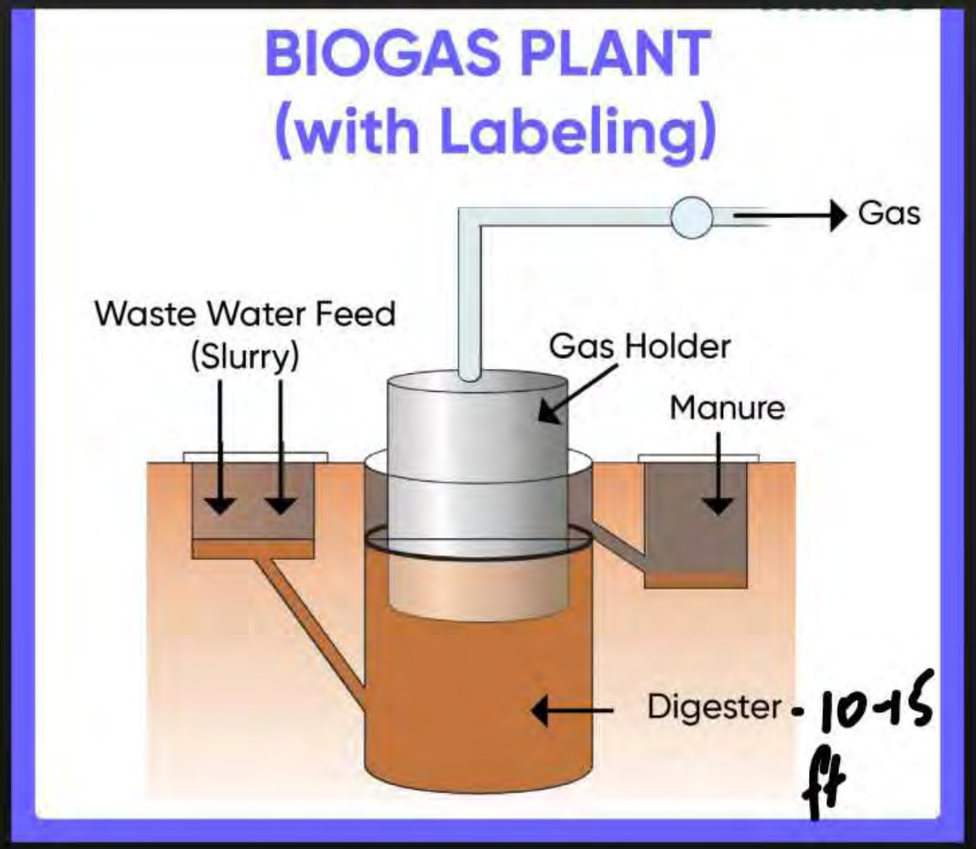
amt of O_2 needed by floc to breakdown dissolved wastes in one ltr water

BOD CONCEPT (VERY IMPORTANT)

BOD Level	Interpretation
High BOD	Highly polluted
Low BOD	Cleaner water

Final Steps

Step	Description
Activated sludge	Settled microbes
Anaerobic digestion	Methane production
Gas produced	Biogas



- JARI & KVIC
- Gases- H_2S, H_2, CH_4
- 10-15 ft

MICROBES AS BIOCONTROL AGENTS

EXAMPLES

Agent	Target
Ladybird	Aphids
Dragonflies	Mosquitoes
Bacillus thuringiensis (Bt)	Caterpillars
Trichoderma	Plant pathogens
Baculovirus	Insects

Bacteria

root

Soil fungi

molluscs

(NPV)

Species specific
narrow spectrum insecticide

MICROBES AS BIOFERTILISERS

A. BACTERIA

Microbe	Function
Rhizobium	Nitrogen fixation (symbiotic)
Azotobacter	Free-living N_2 fixation
Azospirillum	Soil enrichment

Heterotrophic

Free living N_2 fixation

B. FUNGI (MYCORRHIZA)

Genus	Benefit
Glomus	Phosphorus absorption

Mycorrhiza

C. CYANOBACTERIA - Bluegreen algae -

Example	Use

Nosto
Oscillatoria
Anabena

Question

The technology of biogas production was developed in India due to the efforts of

A KVIC

B IARI

C CDRI

D Both A and B

Question

Which among the following products of microbes is not obtained from fungi?

A. Penicillin

B. Statins

C. Swiss cheese

D. Cyclosporin-A

Question

Math the following

Column I		Column II	
i.	Cyclosporin –A	a.	Clot busters
ii.	Streptokenase	b.	Antibiotic
iii.	Statins	c.	Immuno suppressive agent
iv.	Penicillin	d.	Blood cholesterol lowering agent

	i	ii	iii	iv
A	c	a	d	b
B	a	b	d	c

	i	ii	iii	iv
A	c	d	a	b
B	a	b	d	c

Question

Identify a micro-organism that can produces biomass of protein.

A. Monoscus purpureus

B. Aspergillus niger

C. Methylohilus methylotrophus

D. Trichoderma polysporum

Question

Which one of the following has been commercialized as blood-cholesterol lowering agent?

A Streptokinase

B Cyclosporine-A

C Statins

D a-Trypsin-A

Question

As the organic matter increase in a water body, the BOD:

A. Increase

B. Decreases

C. Remains unchanged

D. Not a parameter

Question

Microbes like Spirulina can be good alternate to the conventional sources of proteins for human nutrition, because

A. They give more biomass in less time.

B. They are produced using synthetic fertilisers.

C. Their proteins are different from plant proteins

D. They have high fibre content

Question

Roquefort cheese is ripened by

A Virus

B Bacterium

C Yeast

D Fungi

Question

Ernest chain and howard Florey.s contribution was

A Discovery of streptokinase

B Discovery of DNA sequence

C Establishing the potential of penicillin as an effective antibiotic

D Production of genetically engineered insulin

Question

The microorganisms involved in floc formation during sewage treatment are

A. Anaerobic bacteria and fungus

B. Aerobic bacteria and fungus ✓

C. Autotrophic bacteria and Yeast

D. Fungus and algae

Question

Math the following

List I		List II	
1.	Lactobacillus	I.	Butyric acid
2.	Aspergillus niger	II.	Acetic acid
3.	Acetobacteraceae	III.	Lactic acid
4.	Clostridium butyricum	IV.	Citric acid

	1	2	3	4
A	III	II	IV	I
B	III	IV	II	I

	1	2	3	4
A	I	IV	III	I
B	III	IV	I	II

Question

Roquefort cheese' is ripened by using a

A. Type of Yeast

B. Fungus

C. Bacterium

D. Cyanobacteria

Question

In sewage treatment, secondary treatment is considered highly significant, because

A. It helps to remove debris from the sewage.

B. It reduces the BOD level of sewage

C. It helps in the production of biogas

D. It increases the organic content of sewage

Question

Ruminant animals can digest cellulose in their food, where as human beings are unable to do so. This is because

A Methanogens are present in human gut.

B Cellulose is a complex sugar

C Cellulose reduces the bulk of food

D Methanogens are absent in human gut

Question

'Flocks' is

A. The primary sludge produced in sewage treatment

B. A type of bio fortified food

C. A mesh-like structure formed by the association of bacteria and fungal filaments in sewage treatment

D. The effluent in primary treatment tank obtained during sewage treatment

Question

The large holes in 'Swiss - Cheese' are made by a

A. Bacterium producing a large amount of CO_2

B. Machine

C. Fungus that releases a lot of gases during metabolic activities

D. Bacterium that produces methane gas

Question

Which vitamin is increased by 'LAB' in curd ?

A. Vitamin B12

B. Vitamin C

C. Vitamin E

D. Vitamin B

Question

Enzyme which is useful to remove the oily stains in laundry?

A. Amylase

B. Renin

C. Lipase

D. Protease

pectinase & proteases - clarifying bottled juices

Question

Identify the incorrect statement with reference of biocontrol agents:

A. They help to increase the use of synthetic pesticides

B. They do not affect non-target pests

C. They do not show any negative impact on crop plants

D. They are significant in treating ecologically sensitive area

Question

A Farmer has applied chemical fertilisers in his crop field for many successive seasons. In the next season, the crop growth was poor as soil lost its fertility. Suggest the suitable micro- organism that replenishes the fertility of soil in his field.

A Nostoc

B Spirogyra

C Spirulina

D Chlorella

Question

Math the microbial products listed under Column-I with the related microbes given under column II; choose the appropriate option from the given choices

Column-I		Column-II	
A.	Citric acid	p.	Methanobacterium
B.	Cyclosporin A	q.	Monascuspurpureus
C.	Statin	r.	Aspergillusniger
D.	Gobar gas	s.	Trichodermapolysporum
		t.	Clostridium butylicum

A. A-r; B-s; C-q; D-p

B. A-t; B-q; C-s; D-r

C. A-q; B-s; C-t; D-r

D. A-r; B-s; C-q; D-t

Question

During sewage treatment biogas produced includes

A. Methane, Oxygen, Hydrogen sulphide

B. Hydrogen sulphide, Methane, Sulphur oxide

C. Hydrogen sulphide, Nitrogen, Methane

D. Methane, Hydrogen sulphide, Carbon dioxide

Question

The primary treatment of sewage water involves

A. Sludge digestion

B. Aerobic bacterial activity - Aeration tank

C. Anaerobic bacterial activity - Anerobic sludge digester

D. Filtration and sedimentaion

Question

BOD refers to

A. The amount of oxygen consumed if all the organic matter in 1000 ml of water were oxidized by bacteria

B. The amount of oxygen released when all the organic matter was consumed by bacteria in 1 litre of water

C. The oxygen required for bacteria to grow in 1 litre of effluent

D. The amount of oxygen released if all the organic matter in 1000 ml of water were oxidized by bacteria

Thank You