

R-DNA Technology Toolkit

The molecular instruments required to engineer, amplify, and express recombinant DNA.



Restriction Enzymes:
Precision cutting.



Polymerases:
Target amplification.



Ligases & Vectors:
Assembly & delivery.



Competent Hosts:
Gene expression.

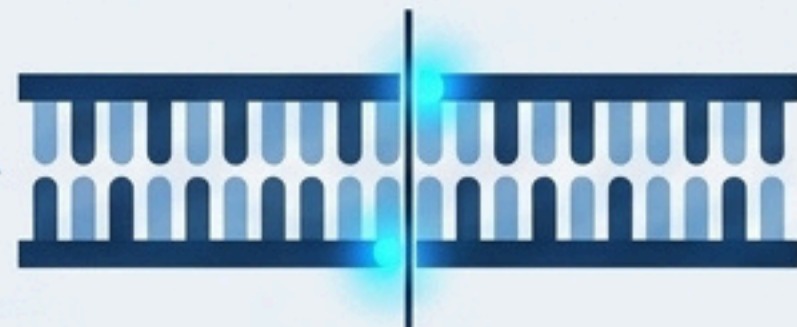
Restriction Enzymes: The Molecular Scissors

Nuclease Classification

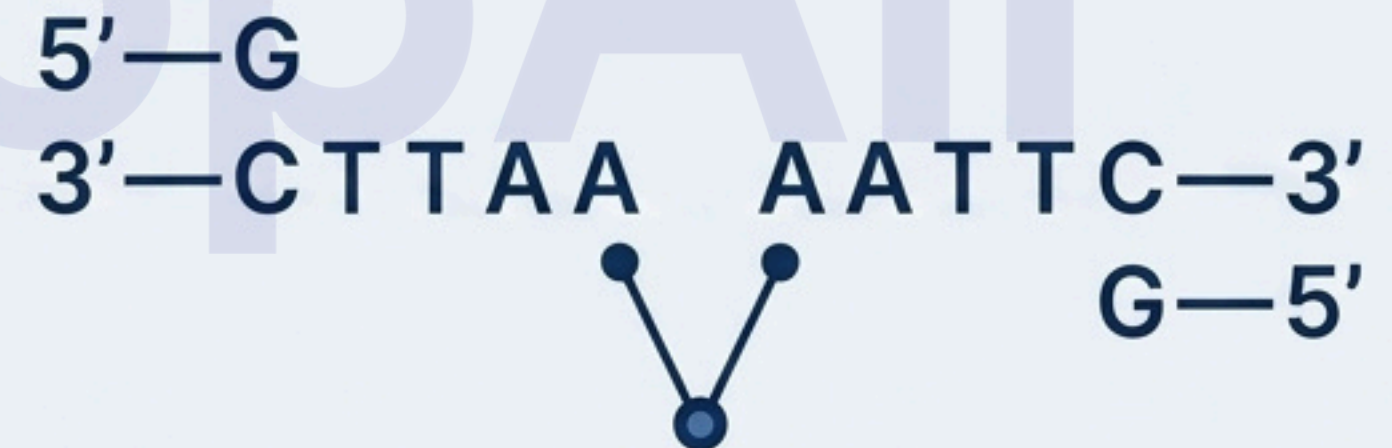
Exonucleases



Endonucleases



The Mechanism: EcoRI



Sticky Ends: Overhanging single-stranded portions that facilitate hydrogen bonding with complementary cut counterparts.



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

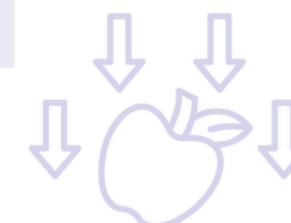
Practice Now



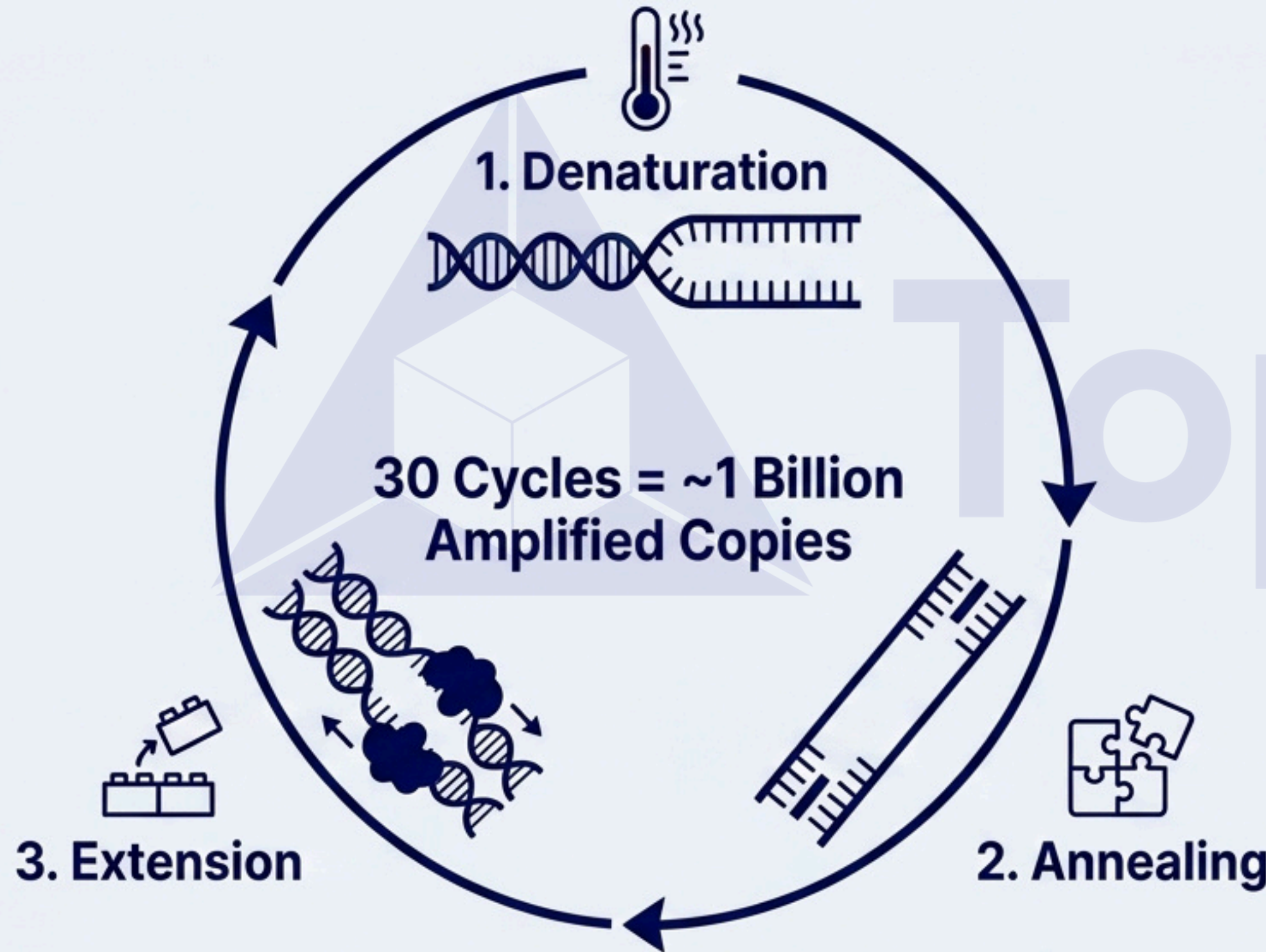
At prep.topall.app

Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter



Polymerase Enzymes: Amplifying the Gene of Interest

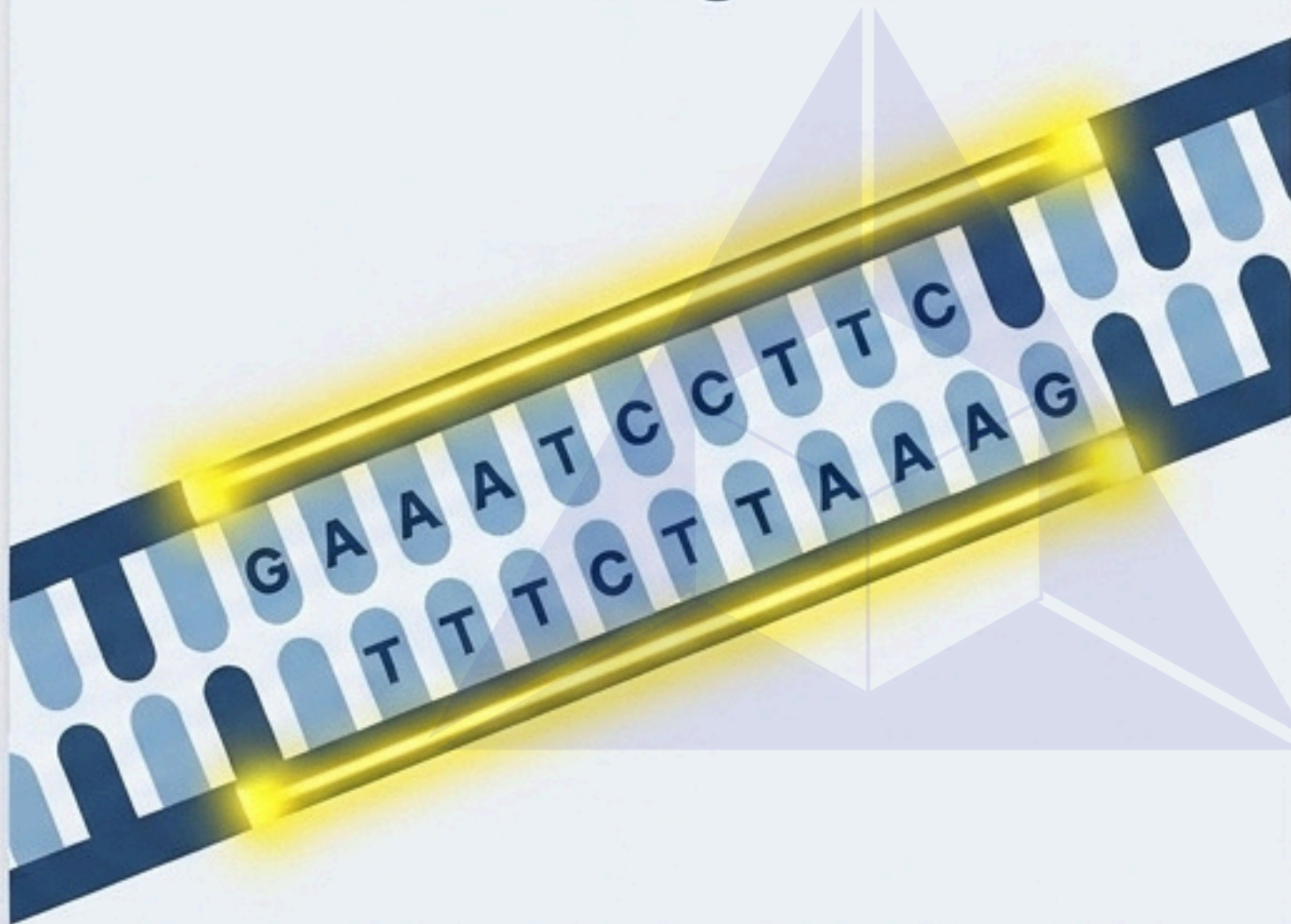


The Star Tool: Taq Polymerase

- Isolated from the bacterium *Thermus aquaticus*.
- Thermostable: Remains entirely active during the high-temperature denaturation phase that destroys normal enzymes.

Ligases & Vectors: Assembly and Delivery

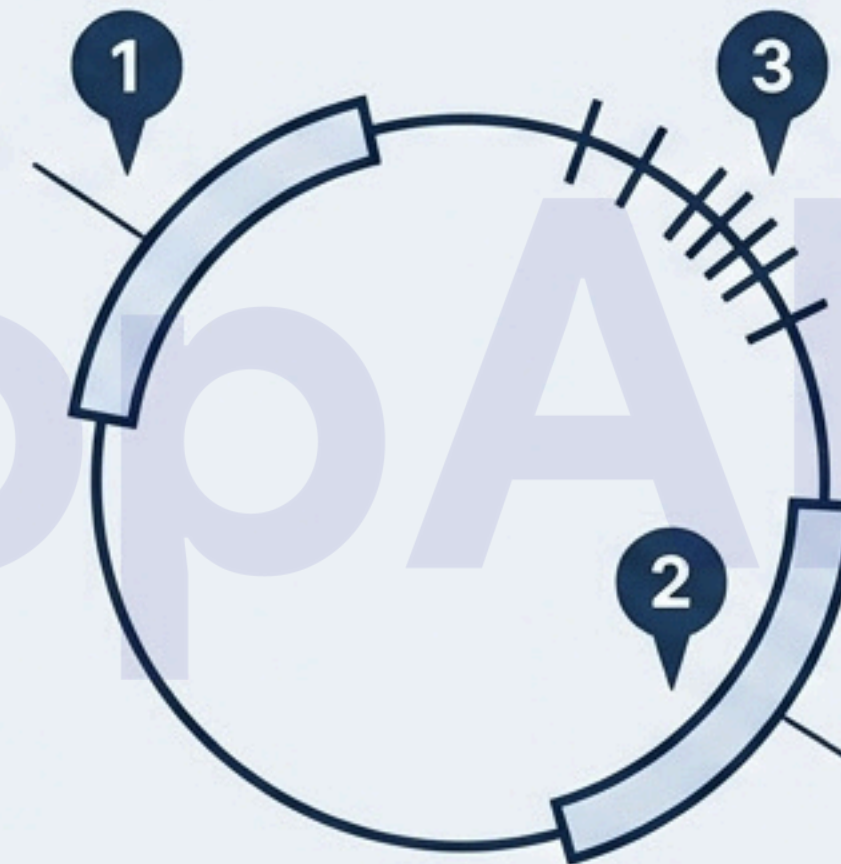
DNA Ligase



Acts on cut DNA molecules to join their sugar-phosphate backbones, sealing the recombinant construct.

Cloning Vector Blueprint

ori (Origin of Replication):
Controls copy number and initiates replication.



Cloning Sites:
Specific recognition sites for linking alien DNA.

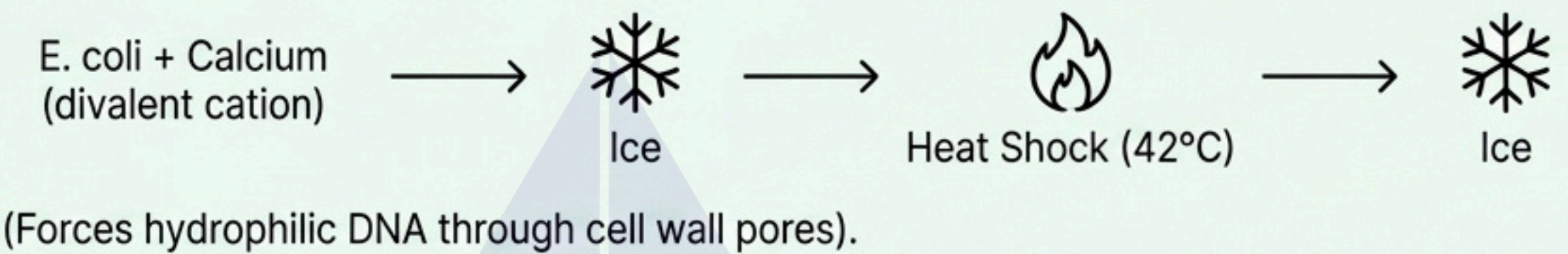
Selectable Marker:
Identifies transformants (e.g., Ampicillin resistance, or insertional inactivation / β -galactosidase).

Specialized Vectors: *Agrobacterium tumefaciens* (disarmed Ti plasmid for plants), Retroviruses (animals).

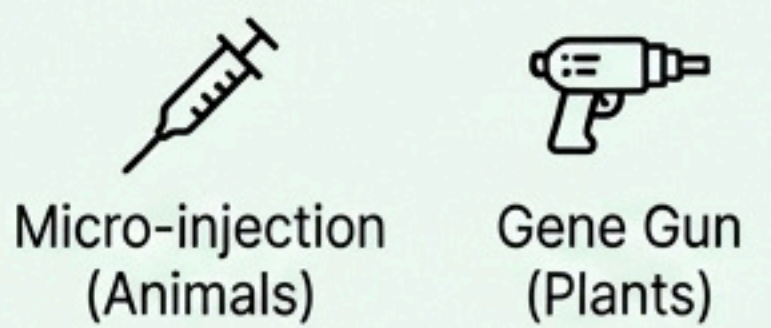
Competent Hosts & Exam Synthesis



Installing the Construct (Chemical Method)



Alternative Tools



NEET Key Takeaway Matrix

Tool	Specific Example	Core Action	NEET Buzzword
Restriction Endonuclease	EcoRI	Cuts specific internal sequences	Palindromic / Sticky Ends
Polymerase	Taq Polymerase	Amplifies DNA in vitro (PCR)	Thermostable
Ligase	DNA Ligase	Joins DNA fragments	Sugar-Phosphate Backbone
Vector	Plasmid (e.g., pBR322)	Autonomously replicates / delivers DNA	ori / Selectable Marker



You've Learned the Theory.

Now Let's Test It.

Reading notes gets you knowledge.

Practicing MCQs gets you marks.

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Practice the moment you finish studying
Jump in while the concept is still fresh in your head

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MCQs

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