+91 9815591973 support@examlife.info

Exam Life™
Be The Change

- ☀ ☾
- Home
- UPSC
    - Current Affairs IAS
    - करंट अफेयर्स फॉर आईएएस
    - Quiz IAS
    - आईएएस के लिए प्रश्नोत्तरी
    - UPSC News Editorial (हिंदी /Eng)
    - Answer Writing (हिंदी /Eng)
    - UPSC Essay (हिंदी /Eng)
    - UPSC GS (हिंदी /Eng)
        - UPSC GS 1 (हिंदी /Eng)
        - UPSC GS-2 (हिंदी /Eng)
        - UPSC GS-3 (हिंदी /Eng)
        - UPSC GS-4 (हिंदी /Eng)
    - Kurukshetra (हिंदी /Eng)
    - Yojana (हिंदी /Eng)
    - IAS Strategy for Prelims
        - General Studies
        - UPSC CSAT Paper 2
    - IAS Strategy for Mains
        - IAS GS 1
        - IAS GS 2
        - IAS GS 3
        - IAS GS 4
    - IAS Test Series
- Himachal HPAS
    - Himachal Daily Current Affairs
    - हिमाचल नियमित समाचार
    - Daily Himachal GK Quiz

    - दैनिक क्विज़ हिमाचल HPAS
    - Himachal News Editorial (हिंदी /Eng)
    - Answer Writing (हिंदी /Eng)
    - Himachal Essay (हिंदी /Eng)
    - Giriraj
        - Magazine
        - Giriraj Quiz
    - गिरिराज
        - पत्रिका
        - गिरिराज प्रश्नोत्तरी
    - HP Government Schemes
    - हिमाचल प्रदेश सरकार की योजनाएं
    - Syllabus Prelims Himachal HPAS
        - GENERAL STUDIES
        - UPSC CSAT Paper 2
            - English
            - Hindi
    - Syllabus Mains Himachal HPAS
        - English,Hindi,Essay & One Optional
        - HPAS GS 3
        - HPAS GS 2
        - HPAS GS 1
    - Himachal HPAS Test Series
    - All You need to Know about Himachal HPAS
- HARYANA HCS
    - Haryana Current Affairs
    - हरियाणा करेंट अफेयर्स
    - HCS Quiz
    - एचसीएस प्रश्नोत्तरी
    - Haryana News Editorial (हिंदी /Eng)
    - Answer Writing (हिंदी /Eng)
    - Haryana Essay (हिंदी /Eng)
    - HR Government Schemes
    - हरियाणा सरकार की योजनाएं
    - Syllabus Mains Haryana HCS
    - Syllabus Prelims Haryana HCS
    - HCS Prelims Test Series

- □□□□□□ □□□□□□□□□ □□□□□ □□□□□
- Punjab PCS
  - Punjab PCS Current Affairs
  - Daily Quiz Punjab PCS
  - Punjab News Editorial (Eng)
  - Answer Writing (Eng)
  - Punjab Essay (Eng)
  - All you need to know about Punjab PCS Exam 2021
  - Syllabus Prelims Punjab PCS
    - General Studies
    - Prelims GS 1
  - Syllabus Mains Punjab PCS
    - PCS GS 1
    - PCS GS 2
    - PCS GS 3
    - PCS GS 4
    - Online PUNJAB PCS TEST SERIES 2020
- CSAT
  - CSAT English
  - □□□□□ □□□□□
- Concept Mindmaps
  - Polity (□□□□□ / Eng)
  - Geography (□□□□□ / Eng)
  - Enviroment (□□□□□ / Eng)
  - History (□□□□□ / Eng)
  - Economics (□□□□□ / Eng)
  - Science and Technology (□□□□□ / Eng)
  - CSAT Concepts (□□□□□ / Eng)
  - Maps (□□□□□ / Eng)
  - Art and Culture (□□□□□ / Eng)
  - International Affairs (□□□□□ / Eng)
  - Punjab PCS Concepts
  - Himachal HPAS Concepts (□□□□□ / Eng)
  - Haryana HCS Concepts (□□□□□ / Eng)
  - Rajasthan RAS Concepts (□□□□□ / Eng)
- Concept Quiz
  - Polity Quiz (□□□□□/Eng)

- Geography Quiz (□□□□□/Eng)
- Enviroment Quiz (□□□□□/Eng)
- History Quiz (□□□□□/Eng)
- Economics Quiz (□□□□□/Eng)
- Science and Technology Quiz (□□□□□/Eng)
- CSAT Concepts Quiz (□□□□□/Eng)
- Maps Quiz (□□□□□/Eng)
- Art and Culture Quiz (□□□□□/Eng)
- Punjab PCS Concepts Quiz
- Himachal HPAS Concepts Quiz (□□□□□/Eng)
- Haryana HCS Concepts Quiz (□□□□□/Eng)
- Rajasthan RAS Concepts Quiz (□□□□□/Eng)

- Mains
  - UPSC Answer Writing (□□□□□/Eng)
  - HPPSC Answer Writing (□□□□□/Eng)
  - Haryana HCS Answer Writing (□□□□□/Eng)
  - Punjab PCS Answer Writing
- Exam Blogs
  - UPSC Exam Blogs
  - Himachal Exam Blogs
  - Punjab exam Blogs
  - Haryana Exam Blogs
  - Rajasthan Exam Blogs
  - E-Magazine
    - E-Magazine for HPAS
    - □□□□□□□□ □□ □□□ □-□□□□□□□□
    - E-Magazine for Punjab PCS
- UPCOMING EXAMS
  - National Exams
  - Himachal Pradesh Exams
  - Punjab Exams
  - Test Series Planner
- About US
- Sign Up
- Login
- facebook 

- instagram 
- youtube 

MENU
Click on Drop Down for Current Affairs

Topics Covered

-
    - Summary:
  - What is the news?
    - Understand the Concept of Higgs Boson with Simple Example:
    - Example: Tiny Building Blocks and a Missing Piece
    - Enter Dr. Higgs and the Invisible Field
    - The Hunt for the Missing Lego: The Higgs Boson
    - A Big Discovery: Finding the Missing Piece
    - The Legacy: A Stepping Stone to More Discoveries
  - Key Points about the Higgs Boson:
    - Summary:
    - QuizTime:
    - Are you Ready!
- Read the Below Instructions Carefully:
    - Please Rate!
- Mains Questions:
    - Question 1:
    - Model Answer:
    - Question 2:
    - Model Answer:
    - Question 3:
    - Model Answer:
    - Relevance to the UPSC Prelims and Mains

syllabus under the following topics:

- Prelims:
- Mains:

Summary:

- Peter Higgs' Passing: Nobel laureate and physicist Peter Higgs, known for proposing the Higgs boson, has passed away at 94.
- Higgs Boson Explained: The Higgs boson, or "God particle," is a fundamental particle that imparts mass to other particles through the Higgs field.
- Significance of Discovery: The Higgs boson discovery at CERN's LHC in 2012 confirmed predictions of the Standard Model and advanced our understanding of the universe.
- Impact on Physics: This breakthrough has implications for future discoveries, potentially leading to new particles and forces beyond the Standard Model.

What is the news?

- Nobel prize-winning British physicist Peter Higgs, who proposed the existence of a mass-giving particle, which became known as the Higgs boson or the "God particle", has died aged 94.

Understand the Concept of Higgs Boson with Simple Example:

The Higgs Boson: Unveiling the Universe's Building Blocks (Not a God Particle!)

- Have you ever wondered why some balls feel heavier than others? It's not magic! Scientists have been trying to understand this for a long time, and a big discovery called the Higgs boson helped unlock this secret.

Example: Tiny Building Blocks and a Missing Piece

- Imagine the universe is made of tiny building blocks, like Legos (See its images on Internet). We call these fundamental particles, and scientists have discovered many of them. But there was a puzzle: why do some particles seem heavier than others? It's like having some Legos feel heavier for no reason!

Enter Dr. Higgs and the Invisible Field

- In the 1960s, Dr. Peter Higgs had a brilliant idea. He proposed that there might be an invisible

field everywhere, like an invisible ocean. When these tiny building blocks travel through this field, some get “stuck” a little more than others. This “stuckness” acts like mass, making them feel heavier.

The Hunt for the Missing Lego: The Higgs Boson

- This “stuck” particle, predicted by Dr. Higgs, was called the Higgs boson. But how could scientists find something invisible? They built a giant machine called the Large Hadron Collider (LHC) that could smash particles together at super speeds, hoping to create the Higgs boson for a fleeting moment.

A Big Discovery: Finding the Missing Piece

- After years of searching, scientists at the LHC finally found evidence of the Higgs boson in 2012! It was a major breakthrough, like finding the missing Lego piece that explained why some particles seem heavier.

The Legacy: A Stepping Stone to More

Discoveries

- The discovery of the Higgs boson was a giant leap forward. Now, scientists can study its properties to learn even more about the universe's building blocks. It might even lead to finding new particles and forces we don't even know exist yet!
- The Higgs boson may not be a "God particle," but it's a crucial piece in the puzzle of understanding our universe. Thanks to Dr. Higgs' idea and the hard work of scientists, we're closer to unlocking the secrets of the tiny building blocks that make up everything around us!

Key Points about the Higgs Boson:

The Higgs Field:

- Proposed in the 1960s to explain mass.
- Fills all of space and interacts with particles, giving them mass.

The Higgs Boson:

- Discovered in 2012 at CERN's Large Hadron Collider (LHC) ,the most powerful particle accelerator in the world, located at the European particle physics laboratory CERN, Switzerland..
- Confirms the existence of the Higgs field and the mechanism for mass.
- Nicknamed the "God particle" for its importance.

- One of the fundamental particles in the Standard Model.
- Massively heavy (130 times a proton).
- Spinless and chargeless.
- A boson, a “force carrier” particle associated with a field.

Mass Mechanism:

- Particles interact with the Higgs field, gaining mass through this interaction.
- Stronger interaction leads to greater mass.
- The Higgs boson itself gets mass this way.
- Photons (light) have no mass because they don’t interact with the Higgs field in this way.
- This applies to fundamental particles, not composite ones like protons.This is because spontaneous symmetry breaking doesn’t happen for photons as it does for its fellow force-carrying particles.

Summary:

The Higgs boson, sometimes referred to as the Higgs particle, is an elementary particle in the Standard Model of particle physics. Let me break down some key points about it:

- **Higgs Field:** The Higgs boson is associated with the Higgs field, which is responsible for granting mass to other fundamental particles. This field was first proposed in the mid-1960s by physicist

Peter Higgs, after whom the particle is named.

- **Mass and Resistance:** A particle’s mass determines how much it resists changing its speed or position when it encounters a force. Not all fundamental particles have mass, but the Higgs field imparts mass to them.
- **Scalar Boson:** The Higgs boson is a massive scalar boson with zero spin, even (positive) parity, no electric charge, and no color charge. It couples to (interacts with) mass.
- **Unstable Nature:** The Higgs boson is highly unstable, decaying into other particles almost immediately upon generation.
- **Discovery:** After a 40-year search, scientists discovered a subatomic particle with the expected properties of the Higgs boson in 2012. The discovery was made by the ATLAS and CMS experiments at the Large Hadron Collider (LHC) at CERN near Geneva, Switzerland.
- **Mass Determination:** The mass of the Higgs boson has been experimentally determined to be approximately 125.11 GeV/c^2 by the ATLAS experiment and 125.35 GeV/c^2 by the CMS experiment.

In summary, the Higgs boson plays a crucial role in our understanding of particle physics and the origin of mass in the universe.

Examlife

On Whatsapp Now

Introducing Examlife Channel - Your Ultimate Destination for Daily Most Important Current Affairs and Quiz! Follow Examlife Channel today!

QuizTime:

0 votes, 0 avg

0

Are you Ready!

Thank you, Time Out !

Created by **Examlife**

General Studies

CURRENT AFFAIRS QUIZ

Read the Below Instructions Carefully:

- Click on - Start Quiz
- Attempt all questions (You can attempt or leave)

- After Attempting Last Question.
- Enter Name & Email
- Click on - Check Result
- Scroll down - Check out Solutions too.

Thank you.

Loading ...

1 / 5

Category: **General Studies**

The Large Hadron Collider (LHC) was built to:

○ Study the effects of climate change.

○ Observe distant galaxies with high resolution.

○ Smash particles together at high speeds.

○ Develop new medical treatments.

Prev Finish Next

2 / 5

Category: **General Studies**

Future research on the Higgs Boson might lead to:

○ Developing new methods of food production.

○ Understanding the nature of dark matter.

○ Creating faster airplanes.

○ Improving weather forecasting techniques.

Prev Finish Next

3 / 5

Category: **General Studies**

Why is the Higgs boson sometimes called the “God particle”?

- ○ It has religious significance.
- ○ It explains the origin of the universe.
- ○ It was named by a Nobel laureate.
- ○ It completes the Standard Model.

Prev Finish Next

4 / 5

Category: **General Studies**

How does the Higgs field give mass to elementary particles?

- ○ By directly transferring mass to particles.
- ○ By interacting with the strong nuclear force.
- ○ By resisting particle motion.
- ○ By creating new particles.

Prev Finish Next

5 / 5

Category: **General Studies**

The discovery of the Higgs Boson is significant because it:

- ○ Proved the existence of extraterrestrial life.
- ○ Validated a key prediction of the Standard Model.
- ○ Provided a new source of clean energy.
- ○ Helped develop new communication technologies.

Prev Finish

Check Rank, Result Now and enter correct email as you will get Solutions in the email as well for future use!

Check the Result

Your score is

0%

Restart quiz

Please Rate!

Send feedback

Mains Questions:

Question 1:

The efforts to detect the existence of the Higgs boson particle have become frequent news

in the recent past. What is the importance of discovering this particle?(250 Words)

Model Answer:

The Importance of Discovering the Higgs Boson

- The discovery of the Higgs boson is a monumental achievement in the field of particle physics. Let’s explore why this tiny particle holds such significance:

The Higgs Field and Mass Generation

- At the heart of the Higgs boson lies the concept of the Higgs field. Proposed by physicist Peter Higgs in the 1960s, this field permeates all of space. It interacts with other fundamental particles, endowing them with mass. Imagine the Higgs field as a cosmic molasses—particles moving through it experience resistance, which manifests as mass.

Completing the Standard Model

- The Higgs boson is the missing piece in the Standard Model, our current best description of fundamental particles and their interactions. The Standard Model elegantly unifies electromagnetism, the weak nuclear force, and the strong nuclear force. However, it lacked an explanation for mass. The Higgs mechanism, involving the Higgs field and the Higgs boson, completes this puzzle.

Experimental Confirmation

- After decades of theoretical work, scientists at CERN (the European Organization for Nuclear

Research) finally detected the Higgs boson in 2012 using the Large Hadron Collider (LHC). The ATLAS and CMS experiments independently confirmed its existence. The Higgs boson's mass was measured to be around 125 GeV/c^2.

Implications for the Universe

- The Higgs field's non-zero average value explains why certain particles have mass while others remain massless (like photons). Without the Higgs mechanism, the universe would lack structure—no atoms, no stars, no galaxies. Essentially, the Higgs boson is the cosmic "glue" that holds everything together.

Beyond the Standard Model

- While the Higgs boson fits beautifully into the Standard Model, it also opens doors to new physics. It could be a gateway to understanding dark matter, supersymmetry, or even extra dimensions. Scientists continue to explore these possibilities.

In summary, the discovery of the Higgs boson is a triumph of human curiosity and ingenuity. It validates our understanding of the universe's fundamental building blocks and inspires further exploration.

Question 2:

Why is the Higgs particle sometimes called the "God particle"?(250 Words)

Model Answer:

The “God Particle” and Its Origins

- The Higgs boson has an intriguing nickname: the “God particle.” Let’s unravel the story behind this moniker:

Leon Lederman’s Catchy Title

- The term “God particle” wasn’t coined by a physicist but by Nobel laureate Leon Lederman. In his 1993 book, “The God Particle: If the Universe Is the Answer, What Is the Question?” Lederman aimed to make particle physics accessible to the public. He chose this provocative title to grab attention.

Not Religious or Mystical

- Contrary to what the name suggests, the Higgs boson has no religious or mystical significance. It doesn’t connect to any divine force. Instead, it’s a fundamental particle with specific properties.

Why “God”?

- Lederman explained that he originally wanted to call it the “Goddamn particle” due to its elusive nature. However, his publisher objected, and “God particle” stuck. The idea was that finding this particle was so crucial that it would help explain the universe’s mysteries.

Importance Beyond the Name

- While the nickname may raise eyebrows, the Higgs boson’s importance lies in its role within the

Standard Model. It completes our understanding of mass and the forces governing particles. The Higgs field, mediated by the Higgs boson, is essential for our existence.

In summary, the “God particle” is a catchy label, but its true significance lies in unraveling the fabric of the cosmos.

Question 3:

Explain the concept of the Higgs boson and its role in the Standard Model of particle physics. Discuss the significance of the discovery of the Higgs boson for our understanding of the universe. (250 Words)

Model Answer:

- The Higgs boson, often nicknamed the “God particle,” is an elementary particle theorized to explain why other particles have mass. The Standard Model, a framework describing fundamental particles and forces, predicted the existence of the Higgs field, a field permeating all of space. Particles interacting with this field would acquire mass.

- The discovery of the Higgs boson in 2012 at the Large Hadron Collider (LHC) was a landmark achievement. It confirmed a key prediction of the Standard Model and

provided strong evidence for the Higgs field. This discovery significantly impacts our understanding of the universe by:

- Validating the Standard Model: The Higgs boson's existence solidified the Standard Model as a robust framework for understanding fundamental particles.
- Explaining Mass: It provided a mechanism for explaining why particles have different masses, a fundamental property of matter in the universe.
- Opening Doors for New Discoveries: Deviations from the Higgs boson's predicted behavior could indicate new forces and particles beyond the Standard Model, leading to further breakthroughs.

Remember: These are just sample answers. It's important to further research and refine your responses based on your own understanding and perspective. Read entire UPSC Current Affairs.

Relevance to the UPSC Prelims and Mains syllabus under the following topics:

Prelims:

- **GS Paper I: Science :**The Higgs boson is not explicitly mentioned in the UPSC Prelims syllabus. However, questions related to scientific discoveries, particle physics, and fundamental concepts may indirectly touch upon the Higgs boson.

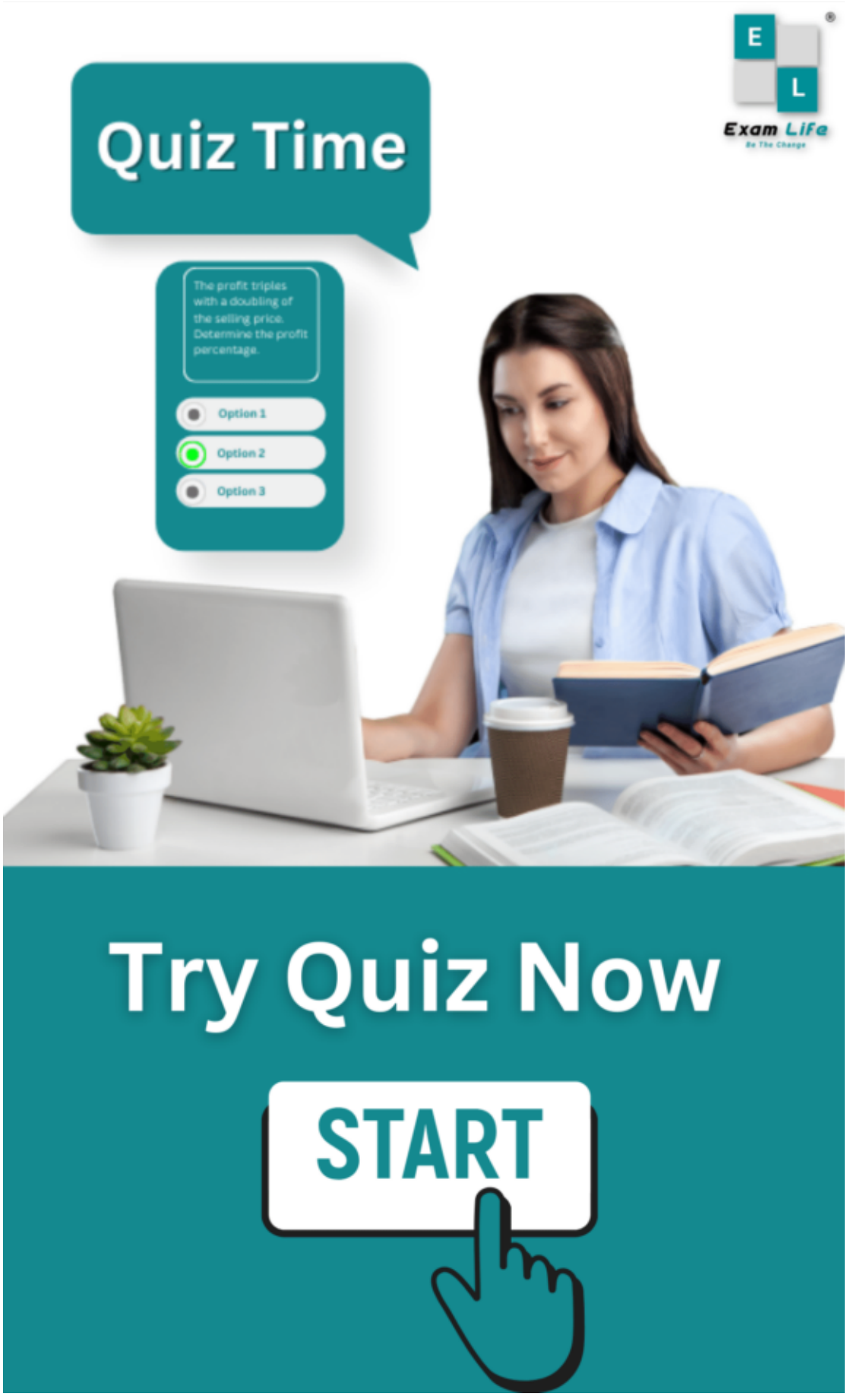
Mains:

- **GS Paper III:** The Higgs boson is relevant for the Science and Technology section of the General Studies Paper-3.
  Specifically, it falls under the subtopic of “Science and Technology in Everyday Life” and “Recent Developments in Science and Technology.”

Exam LiFe®
Be The Change

Click here to read in Hindi.

CLICK HERE


Quiz Time
The profit triples with a doubling of the selling price. Determine the profit percentage.
Option 1
Option 2
Option 3
Exam Life
Be The Change
Try Quiz Now
START

UPSC

- National Current Affairs
- UPSC Quiz
- Editorials
- Mindmaps
- E-Magazine
- Free Mock Test
- Prelims Test Series

यूपीएससी

- राष्ट्रीय करेंट अफेयर्स
- यूपीएससी प्रश्नोत्तरी
- संपादकीय
- माइंडस्मैप्स
- ई-पत्रिका
- फ्री मॉक टेस्ट
- प्रीलिम्स टेस्ट सीरीज

Examlife Online Prelims Test Series

Enroll Now

Himachal HPAS

- HP Current Affairs
- HPAS Quiz
- HP Editorials
- HP Mindmaps
- HPAS E Magazine
- HPAS Free Mock Test
- HPAS Prelims Test Series

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]
- [illegible]

Punjab PCS

- Punjab Current Affairs
- PPSC Quiz
- Punjab Mindmaps
- Punjab Editorial
- Punjab E-Magazine
- PPSC Free Mock Test
- PPSC Prelims Test Series

Haryana HCS

- Haryana Current Affairs
- HCS Quiz
- HCS Editorials
- HCS Mindmaps
- HCS E-Magazine
- HCS Free Mock Test
- HCS Prelims Test Series

[illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

- एचसीएस ई -पत्रिका
- एचसीएस फ्री मॉक टेस्ट
- एचसीएस प्रीलिम्स टेस्ट सीरीज

Useful Links

- UPSC
- यूपीएससी
- Himachal HPAS
- हिमाचल एच पी ए एस
- Punjab PCS
- Contact us
- About us
- Privacy Policy
- Haryana HCS
- हरियाणा एचसीएस
- CSAT
- सीसैट

Social Media

Examlife Online Prelims Test Series

Enroll Now

- Punjab PCS Exam (Click Here)
- Himachal HPAS Exam (Click Here)
- □□□□□□ □□□□□□□ (Click Here)
- UPSC Preparation (Click Here)
- □□□□□□□□ □□ □□□□□□ (Click Here)