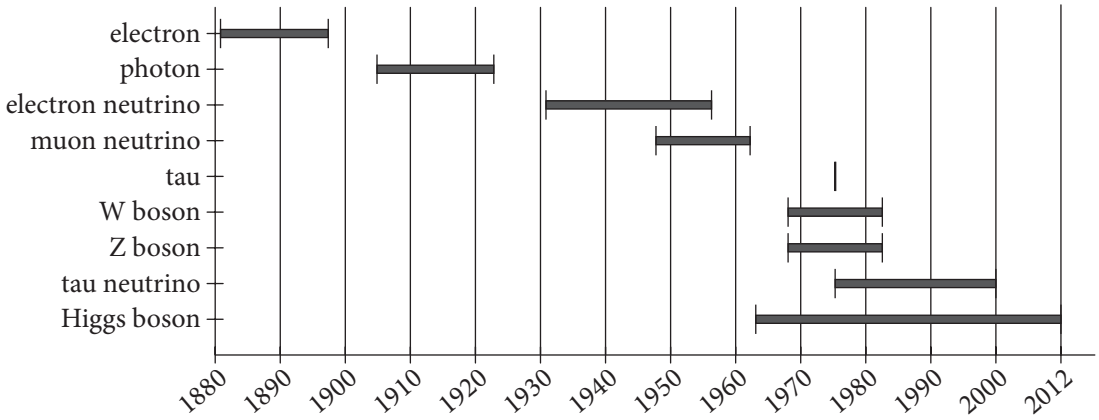
Years from Introduction of Concept of Particle to Experimental Confirmation



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42

Over the course of the passage, the main focus shifts from

A) a technical account of the Higgs field to a description of it aimed at a broad audience.

B) a review of Higgs's work to a contextualization of that work within Higgs's era.

C) an explanation of the Higgs field to a discussion of the response to Higgs's theory.

D) an analysis of the Higgs field to a suggestion of future discoveries that might build upon it.

43

The main purpose of the analogy of the ping-pong ball (line 40) is to

A) popularize a little-known fact.

B) contrast competing scientific theories.

C) criticize a widely accepted explanation.

D) clarify an abstract concept.

44

The author most strongly suggests that the reason the scientific community initially rejected Higgs's idea was that the idea

A) addressed a problem unnoticed by other physicists.

B) only worked if the equations were flawless.

C) rendered accepted theories in physics obsolete.

D) appeared to have little empirical basis.

45

Which choice provides the best evidence for the answer to the previous question?

A) Lines 30-32 ("Instead . . . environment")

B) Lines 46-48 ("In 1964 . . . mathematically")

C) Lines 48-53 ("Not . . . speculation")

D) Lines 67-70 ("The physics . . . space")

CONTINUE

46

The author notes that one reason Higgs's theory gained acceptance was that it

A) let scientists accept two conditions that had previously seemed irreconcilable.

B) introduced an innovative approach that could be applied to additional problems.

C) answered a question that earlier scientists had not even raised.

D) explained why two distinct phenomena were being misinterpreted as one phenomenon.

47

Which choice provides the best evidence for the answer to the previous question?

A) Lines 36-39 ("Push . . . mass")

B) Lines 43-45 ("Its interaction . . . field")

C) Lines 55-63 ("But . . . environment")

D) Lines 78-83 ("On occasion . . . them")

48

Which statement best describes the technique the author uses to advance the main point of the last paragraph?

A) He recounts a personal experience to illustrate a characteristic of the discipline of physics.

B) He describes his own education to show how physics has changed during his career.

C) He provides autobiographical details to demonstrate how Higgs's theory was confirmed.

D) He contrasts the status of Higgs's theory at two time periods to reveal how the details of the theory evolved.

49

As used in line 77, "established" most nearly means

A) validated.

B) founded.

C) introduced.

D) enacted.

50

What purpose does the graph serve in relation to the passage as a whole?

A) It indicates that the scientific community's quick acceptance of the Higgs boson was typical.

B) It places the discussion of the reception of the Higgs boson into a broader scientific context.

C) It demonstrates that the Higgs boson was regarded differently than were other hypothetical particles.

D) It clarifies the ways in which the Higgs boson represented a major discovery.

CONTINUE

51

Which statement is best supported by the data presented in the graph?

A) The W boson and the Z boson were proposed and experimentally confirmed at about the same time.

B) The Higgs boson was experimentally confirmed more quickly than were most other particles.

C) The tau neutrino was experimentally confirmed at about the same time as the tau.

D) The muon neutrino took longer to experimentally confirm than did the electron neutrino.

52

Based on the graph, the author's depiction of Higgs's theory in the mid-1980s is most analogous to which hypothetical situation?

A) The muon neutrino was widely disputed until being confirmed in the early 1960s.

B) Few physicists in 2012 doubted the reality of the tau neutrino.

C) No physicists prior to 1960 considered the possibility of the W or Z boson.

D) Most physicists in 1940 believed in the existence of the electron neutrino.

STOP

If you finish before time is called, you may check your work on this section only. Do not turn to any other section.