

A TRULY BEAUTIFUL MIND

Albert Einstein is born

Albert Einstein was born on March 14, 1879 in the German City of Ulm. He had no signs of greatness. His mother thought that he was a freak.

Albert as uncommon

When he learned to speak he spoke everything twice. He was boring for other children. So he played by himself much of the time. He loved mechanical toys. Looking at his new born sister, Maja, he asked where her wheels were.

Albert belies the headmaster

A headmaster told his father that Einstein would never make a success at anything. Einstein began playing at the age of six. Later he became a gifted violinist.

Leaves school for good

But Einstein was not a bad pupil. He joined a high school in Munich. He scored good marks in every subject. He clashed with his teachers. He did not like strict discipline and order in schools. He left school for good at the age of 15.

Education in Switzerland

A year before his parents had moved to Milan. They left him with relatives. He was able to continue his education in Switzerland.

Goes to University

Einstein was highly gifted in mathematics. He was interested in physics also. He decided to study at a University in Zurich.

Falls in love

He had a special interest in a fellow student. Her name was Mileva Marie. She was a 'clever creature'. She was a Serb. The university in Zurich was one of the few universities in Europe where women could get degrees. Therefore, she had

come to Switzerland. The couple fell in love. However, their love was expressed in science.

Gets a job

At the age of 21, Albert Einstein got his university degree. He also got a job. He became a technical expert in the patent office in Bern in 1920. He was also actually developing his own ideas in secret. He called his desk as the 'bureau of theoretical physics'.

His 'Special Theory of Relativity'

One of the famous papers of 1905 was Einstein's 'Special Theory of Relativity'. According to it time and distance are not absolute. For example, two perfectly accurate clocks will not show the same time if they come together after a journey. From this followed the world's most famous formula. It describes the relationship between mass and energy, $E = mc^2$ (E stands for energy, m for mass and c for the speed of light in a vacuum which is about 300,000 km/s).

Einstein's mother on Mileva

Einstein was solving the most difficult problems in physics. His private life was starting to fail. He wanted to marry Mileva. But his mother was against it.. She thought Mileva was too old for him. She was three years older than him. She was also bothered by Mileva's intelligence.

Einstein marries

The pair finally married in January 1903. They had two sons. But a few years later, the marriage failed. The couple finally divorced in 1919. Einstein married his cousin Elsa the same year.

Receives the Nobel Prize

Einstein's new chapter brought him world fame. In 1915 he had published his 'General Theory of Relativity'. An eclipse of the sun in 1919 proved its accuracy. The newspapers called his work as a scientific revolution. He received the Nobel Prize for Physics in 1921. He received honours and invitations from all over the world after that.

Einstein emigrates to US

The Nazis came to power in Germany in 1933. Einstein emigrated to the United States. Five years later, nuclear fission was discovered by the Nazis in Berlin. It upset the American physicists. They were afraid that the Nazis would build and use an atomic bomb.

Einstein's letter to US President

Einstein wrote a letter to the American President Franklin D. Roosevelt on August 2, 1939. In it he warned that a single bomb of this type might destroy the whole part. It bore fruit. The Americans developed the atomic bomb in secret. They dropped it on Hiroshima and Nagasaki in August 1945.

Einstein work for peace and democracy

Einstein was deeply shaken by the extent of destruction. This time he wrote a public letter to the United Nations. In it he proposed the formation of a world government. But this did not prove effective. Einstein in the next decade involved himself in politics. He wanted to bring an end to the arms buildup. He worked for peace and democracy.

Einstein dies

Einstein died in 1955 at the age of 76. He was celebrated as a visionary and a world citizen.

NCERT SOLUTIONS

Thinking about the Text (Page 50)

Question 1.

Here are some headings for paragraphs in the text. Write the number(s) of the paragraph(s) for each title against the heading. The first one is done for you.

- | | |
|--|--------------------------------|
| (i) Einstein's equation | <input type="text" value="9"/> |
| (ii) Einstein meets his future wife | <input type="text"/> |
| (iii) The making of a violinist | <input type="text"/> |
| (iv) Mileva and Einstein's mother | <input type="text"/> |
| (v) A letter that launched the arms race | <input type="text"/> |
| (vi) A desk drawer full of ideas | <input type="text"/> |
| (vii) Marriage and divorce | <input type="text"/> |

Answers:

- (i) (ii) (iii) (iv)
(v) (vi) (vii)

Question 2.

Who had these opinions about Einstein?

1. He was boring.
2. He was stupid and would never succeed in life.
3. He was a freak.

Answer:

1. His playmates.
2. A headmaster.
3. His mother.

Question 3.

Explain what the reasons for the following are:

1. Einstein leaving the school in Munich for good.
2. Einstein wanting to study in Switzerland rather than in Munich.
3. Einstein seeing in Mileva an ally.
4. What do these tell you about Einstein?

Answers:

1. Einstein left the school in Munich because he did not like the discipline of the school. He hated the school's regimentation and often clashed with teachers.
2. Albert's parents moved to Milan and left their son with relatives. After prolonged discussion, Einstein got his wish to continue his education in German – speaking Switzerland. Actually, it was more liberal than Munich.
3. Einstein saw in Mileva Marie an ally against the "Philistines"—those people in his family and at the university with whom he was constantly at odds. He found that she was a "clever creature".
4. These tell that Einstein was a genius and had the capabilities to achieve his targets. Moreover, he had his own view of life. He liked freedom too much.

Question 4.

What did Einstein call his desk drawer at the patent office? Why?

Answer:

Einstein called his desk drawer at the patent office the "bureau of theoretical physics". Einstein was actually developing his own ideas in secret and his drawer had all the evidences which could reveal the secret.

Question 5.

Why did Einstein write a letter to Franklin Roosevelt?

Answer:

With the emergence of Nazis in Germany, Einstein emigrated to the United States. It was the fact that the Nazis had the ability to develop the atomic bomb. It could destroy the whole world. So he warned Franklin D. Roosevelt in his letter.

Question 6.

How did Einstein react to the bombing of Hiroshima and Nagasaki?

Answer:

The atomic bomb devastated the Japanese cities of Hiroshima and Nagasaki. He was deeply shaken by the extent of the destruction and wrote a public missive to the United Nations.

Question 7.

Why does the world remember Einstein as a 'world citizen'?

Answer:

The world remembers Einstein as a 'world citizen' because he believed in universal peace. When there was the rat race for becoming atomic power, he was worried about the aftermaths of the bomb. He was really a world citizen who was concerned with humanity.

Question 8.

Here are some facts from Einstein's life. Arrange them in chronological order.

- Einstein publishes his special theory of relativity.
- He is awarded the Nobel Prize in Physics.
- Einstein writes a letter to U.S. President, Franklin D. Roosevelt, and warns against Germany's building of an atomic bomb.
- Einstein attends a high school in Munich.
- Einstein's family moves to Milan.
- Einstein is born in the German city of Ulm.
- Einstein joins a University in Zurich, where he meets Mileva.
- Einstein dies.
- He provides a new interpretation of gravity.
- Tired of the school's regimentation, Einstein withdraws from school.
- He works in a patent office as a technical expert.
- When Hitler comes to power, Einstein leaves Germany for the United States.

Answers:

- [1] Einstein is born in the German city of Ulm.
- [2] Einstein attends a high school in Munich.
- [3] Einstein's family moves to Milan.
- [4] Tired of the school's regimentation, Einstein withdraws from school.
- [5] Einstein joins a University in Zurich where he meets Mileva.
- [6] He works in a patent office as a technical expert.

- [7] Einstein publishes his special theory of relativity.
[8] He provides a new interpretation of gravitation.
[9] He is awarded the Nobel Prize in Physics.
[10] When Hitler comes to power, Einstein leaves Germany for the United States.
[11] Einstein writes a letter to U.S. President, Franklin D. Roosevelt and warns against Germany's building of an atomic bomb.
[12] Einstein dies.

EXTRA QUESTIONS

Short Answer Type

Question 1.

What did Einstein's mother think him to be? Why?

Answer:

Einstein's mother thought him to be a 'freak' or someone with an unusual physical abnormality or behavioural problem. She thought of him as a freak because his head seemed too large to her. This made him look different from the other children of his age.

Question 2.

Einstein showed no early signs of his genius one day. Comment.

Answer:

As a child, Einstein had a large head and did not start to speak till he was two-and-a-half years old. Even when he did start speaking he uttered everything twice. He did not interact well with other children, and always played alone. All this showed the absence of genius.

Question 3.

What did Einstein's playmates call him? Why?

Answer:

Einstein's playmates called him 'Brother Boring' as he could not mix up with other children. Neither did he find their games interesting nor did he know how to interact with other children. Also, he did not talk till he was two-and-a-half years old, and even then he repeated each word twice. This made his company boring to his playmates.

Question 4.

What kind of toys attracted the attention of Einstein when he was a child? Why?

Answer:

As a child Einstein was attracted only by mechanical toys. It showed his scientific temperament since mechanical toys work on some kind of scientific principles.

Question 5.

What did Einstein say about his newly born sister? Why?

Answer:

Einstein always played alone with his mechanical toys. He did not have any

playmates as the other children found him boring. When his sister, Maja, was born, he looked at his newborn sister and asked "Fine, but where are her wheels?"

Question 6.

What did the headmaster think about Einstein?

Answer:

The headmaster did not think much of Einstein. He once told his father that whatever profession he chose for Einstein, he would never make a success in his life. He thought that Einstein was incapable of achieving anything in life.

Question 7.

Which musical instrument did Einstein begin to learn? Why?

Answer:

Einstein began to learn playing the violin at the young age of six because his mother wanted him to. He kept this interest alive throughout his life and became a gifted amateur violinist.

Question 8.

How did Einstein fare in high school?

Answer:

Although as a young child Einstein was very slow, still while studying in Munich, he showed great progress in almost all the subjects and scored very good marks in almost all the subjects. He had special interest in Maths and Physics. Later on, he became a great scientist.

Question 9.

Why did Albert Einstein leave school in Munich?

Answer:

Albert Einstein left his school in Munich because he was not happy with the education system and he felt stifled by the strict regimentation of the school. He felt the environment suppressed his inquisitive scientific mind and had frequent clashes with his teachers. He felt suffocated and had to leave school.

Question 10.

Why did Einstein hate school?

Answer:

He hated school and the strict regimentation because of its extreme sense of discipline. He felt suffocated in this atmosphere. He often clashed with his teachers.

Question 11.

After leaving his school in Munich, where did Einstein continue his education?

Answer:

Einstein shifted to the German-speaking part of Switzerland to continue his education after leaving his school in Munich midway. This new place was more liberal than Munich and Einstein's curious and free temperament got a favourable environment over here.

Question 12.

Who was Mileva Marie? Where did Einstein meet her?

Answer:

Mileva Marie was a Serbian student who had come to Zurich University to study because it was one of the few universities in Europe where women could get degrees. Einstein met her at the University. He found her to be a clever girl. She also shared similar interests in art, literature and music and he developed special interest in her. Later they got married.

Question 13.

Why did Albert Einstein see an ally in Mileva Marie?

Answer:

Einstein saw in Mileva Marie, a fellow student at the Zurich University, an ally against the “Philistines”— those people in his family and at the university who did not like art, literature or music with whom he was constantly at odds. In addition, she was intelligent and he found her to be a “clever creature”.

Question 14.

How was Einstein’s private life unravelling after he finished his studies?

Answer:

Albert had wanted to marry Mileva right after finishing his studies, but his mother was against it. She thought Mileva, who was three years older than her son, was too old for him. She was also bothered by Mileva’s intelligence and found her to be “a book”. Einstein put the wedding off.

Question 15.

Why did Einstein’s mother not want him to marry Mileva?

Answer:

There were two reasons for Einstein’s mother not wanting him to marry Mileva. Firstly, the girl was three years older than Einstein and secondly, in his mother’s opinion, she was much too intelligent—‘a book’ just like him.

Question 16.

What did Einstein call his desk drawer at the patent office? Why?

Answer:

Einstein called his desk drawer at the patent office the “bureau of theoretical physics” because he constantly developed new ideas and kept all the papers related to his ideas in the desk in his office in Bern where he was working as a technical expert in the patent office and assessed other peoples’ inventions.

Question 17.

Why did Einstein’s marriage with Mileva not survive long?

Answer:

Although Einstein and Mileva had been in love, their marriage did not survive long because Mileva gradually lost her intellectual ambition. She became a frustrated housewife. There were frequent fights between the couple which resulted in their ultimate divorce in 1919.

Question 18.

Who was Elsa? How did she come into Einstein's life?

Answer:

Elsa was Einstein's cousin. He married her within a year of his divorce from Mileva.

Question 19.

"Einstein's new personal chapter coincided with his rise to world fame". What new personal chapter in Einstein's life is the author talking about here? How did he rise to fame?

Answer:

The new personal chapter in Einstein's life was his marriage to his cousin Elsa in the year 1919 immediately after his divorce from Mileva. This chapter coincided with his rise to world fame when his paper on General Theory of Relativity, published in 1915, was found to be accurate due to the proof that came through the eclipse of the sun in 1919.

Question 20.

What is Einstein's Special Theory of Relativity?

Answer:

According to Einstein's special theory of relativity, time and distance are not absolute. From this followed the world's most famous formula which describes the relationship between mass and energy i.e., $E = mc^2$.

Question 21.

When and for what did Einstein gain international fame?

Answer:

Einstein gained international fame when his paper on General Theory of Relativity was found to be accurate in 1919. The calculations made by Einstein in advance about the deflection of light in the solar gravitational field during the eclipse were proven true in line with his theory. This theory was treated as "a scientific revolution."

Question 22.

How was Einstein honoured for his achievements?

Answer:

Honours came pouring in for Einstein after his theories proved him to be a scientist with exceptional abilities. He was awarded the prestigious Nobel Prize for Physics in 1921. Honours and invitations were conferred on him from all over the world. The newspapers too applauded his genius.

Question 23.

Why did Einstein leave Germany and emigrate to America?

Answer:

Einstein had always loved his freedom and disliked any kind of regimentation, in his personal life or in public. When the Nazi government, with its fascist views, came to power in 1933, he found them very suppressive and autocratic. Therefore, Einstein left Germany and emigrated to America.

Question 24.

“The discovery of nuclear fission in Berlin had American physicists in an uproar”.
Why?

Answer:

The American physicists were disturbed by the discovery of nuclear fission in Berlin because they knew its destructive power. They were afraid that German would make an atom bomb and use it for destructive purposes.

Question 25.

When and why did Einstein write a letter to Franklin Roosevelt?

Answer:

Einstein wrote a letter to Franklin Roosevelt when the Nazis in Germany discovered Nuclear fission. He, and other American physicists were afraid nuclear fission, if used for destructive purposes would cause immense damage. So, Einstein wrote a letter to President Franklin Roosevelt, warning him of the imminent threat.

Question 26.

What was the effect of Einstein’s letter on Roosevelt?

Answer:

The warning sounded by Einstein in his letter to Franklin Roosevelt about the danger of a possible atom bomb made by Germans had an immediate effect on the Americans. They at once swung into action and secretly developed an atom bomb of their own. They then dropped the bombs on the Japanese cities of Hiroshima and Nagasaki.

Question 27.

How did Einstein react to the bombing of Hiroshima and Nagasaki?

Answer:

Einstein was shocked at the extent of destruction caused by the bombing. He wrote a long letter to the United Nations and suggested that there should be a World Government.

Question 28.

Why does the world remember Einstein as a world citizen?

Answer:

The world remembers Einstein as a world citizen as he was deeply hurt by the mass destruction in Japan. He wrote to the United Nations for a world government and campaigned for peace and democracy in the world. He worked for humanity across countries and for the formation of a world government.

Question 29.

What did Einstein campaign for after he got involved in politics?

Answer:

After getting involved in politics, Einstein made sincere efforts for world peace and harmony. He campaigned against the race for armaments and supported the cause of a world government and for peace and democracy.

Long Answer Type

Question 1.

In what ways was Albert Einstein was an unusual child. How? He was different from others in many ways. Do you think that those who think differently succeed in their life like Einstein? Comment.

Answer:

Albert Einstein was an unusual child. He did not have any indication of his greatness. He had a larger than usual head. His mother thought him to be a freak. He was a late talker, and when he started to speak, he said everything twice. According to historian, Otto Neugebauer, the young Albert broke his silence at the supper table one night to say, "The soup is too hot." Greatly relieved, his parents asked why he had never said a word before.

Albert replied, "Because up to now everything was in order." He liked to play by himself and did not enjoy the company of his playmates, who, in turn, called him 'Brother Boring'. He had special interest in mechanical toys. At school, his headmaster thought that he was a useless fellow and would never succeed in his life. But he proved all the speculations wrong.

Question 2.

Write a short note on Einstein's education from school to university. Did he show signs of genius intose early years?

Answer:

As a young boy, Einstein did not show any signs of genius. In fact, his headmaster had a very poor opinion about him and he even informed Einstein's father that his son would never amount to much in life as he wouldn't make a success in any career that he chose. However, as he grew up and joined a school in Munich, he showed appreciable progress in studies scoring good marks in almost all the subjects.

But the strict discipline of the school was not to his liking. As a result, he had frequent clashes with his teachers. Being a person of liberal ideas, he felt so suffocated that he ultimately left that school for good. He chose to complete his studies in a school in Switzerland where the environment was more liberal as compared to Munich. Highly gifted in mathematics and having a great interest in Physics, Einstein joined the university in Zurich after completing school and from here he graduated in 1900.

Question 3.

Einstein succeeded in his professional life but failed miserably in his personal life. Why could Einstein not balance his family and professional life?

Answer:

At the university in Zurich, Einstein met Mileva Marie. Einstein saw in Mileva Marie, a fellow student at the Zurich University, an ally against the "Philistines"- those people in his family and at the university who did not like art, literature or music with whom he was constantly at odds. In addition, she was intelligent and he found her to be a "clever creature". Both fell in love and decided to marry. They married a few years later, in 1903, as his mother had at first opposed his marriage to Mileva.

In 1905, Einstein he published his paper on special theory of relativity, followed by the world famous equation

$E = mc^2$. In 1915, he published his paper on General Theory of Relativity, which gave an absolutely new definition to concept of gravity This theory made him a famous figure, In 1919, during the solar eclipse, his theory came out to be accurate and revolutionized physics.

While Einstein was solving the most difficult problems in physics, his private life was running into problems. Mileva's intellectual ambition was disappearing. They became an unhappy couple as they fought continuously. Finally, they got divorced in 1919. Albert Einstein succeeded in his professional life but did not have a happy married life. However, the same year Einstein married his cousin, Elsa.

Question 4.

What was Einstein's contribution to the knowledge of science? Which values in his character made him a 'global citizen'?

Answer:

Albert Einstein worked on his ideas about relativity and in 1905, he published his 'Special Theory of Relativity', according to which time and distance are not absolute. His theory about the relationship between mass and energy was developed into the famous formula $E = mc^2$, and this equation made him a renowned scientist.

Einstein earned international acclaim with the publication of his General Theory of Relativity which enabled him to calculate in advance the extent of the deflection of light from fixed stars as it passed through the gravitational field of the sun. The theory was declared as "a scientific revolution" by the newspapers. For his contribution to the development of science, Einstein was awarded the Nobel Prize for Physics in 1921.

After this, a number of honours were bestowed upon him. He was against arms build-up. He advocated, peace and democracy in the world. He did not want that his invention should be misused. He thought of humanity, of world peace and democracy. All these values in his character made him a global citizen.

Question 5.

Einstein wrote two letters – to President Roosevelt and to the United Nations. Did his letters have the desired impact? Justify your answer.

Answer:

In 1939, Einstein wrote a letter to the American President, Franklin D. Roosevelt warning him that the atomic bomb if made and used by Germany, could not only destroy the whole port on which it could be dropped, but also the territory surrounding it. The impact of the letter was immediate as the Americans at once developed their own atomic bombs in a secret project. These bombs were dropped on Hiroshima and Nagasaki in Japan in 1945, and as anticipated by Einstein, these bombs caused terrible destruction.

The large scale damage caused by the bombing of Japan perturbed Einstein so much that he wrote a letter to the United Nations. In this letter he proposed that there

should be a world government. This would put an end to the enmity between nations and hence stop wars. This letter did not have any impact.

Reference to Context

[Read the extracts given below and answer the questions that follow.](#)

Question 1.

At the age of two-and-a-half, Einstein still wasn't talking. When he finally did learn to speak, he uttered everything twice. Einstein did not know what to do with other children, and his playmates called him "Brother Boring

(a) What did Einstein's mother think of him when he was a baby? Why?

Answer:

Einstein's mother thought of him as a freak because to her, his head seemed much too large.

(b) Why does the writer point out that Einstein wasn't talking till the age of two-and-a-half?

Answer:

The writer points out that Einstein wasn't talking till the age of two-and-a-half to clarify that his growth parameters were slower as compared to other children of his age.

(c) How did Einstein speak when he finally started talking?

Answer:

When Einstein finally started talking, he used to utter everything twice.

(d) Why was Einstein called "Brother Boring" by his playmates?

Answer:

Einstein's playmates called him "Brother Boring" because he was an introvert and did not interact with other children.

Question 2.

A headmaster once told his father that what Einstein chose as a profession would not matter, because "he will never make a success at anything." Einstein began learning to play the violin at the age of six, because his mother wanted him to. He later became a gifted amateur violinist, maintaining this skill throughout his life.

(a) What was the headmaster's opinion about Einstein?

Answer:

The headmaster's opinion about Einstein was that he would never be successful in his life.

(b) Why did Einstein leave the school in Munich?

Answer:

Einstein left the school in Munich for good because he hated the school's regimentation.

(c) Why did Einstein learn to play violin?

Answer:

Einstein learnt to play the violin to fulfil the desire of his mother.

(d) What kind of a violin player was Einstein?

Answer:

He was a gifted violin player.

Question 3.

But Albert Einstein was not a bad pupil. He went to high school in Munich, where Einstein's family had moved when he was 15 months old, and scored good marks in almost every subject.

(a) What had Einstein's Headmaster said about him?

Answer:

The headmaster had told his father that Einstein would never make a success at anything.

(b) What were Einstein's achievements at school?

Answer:

Albert Einstein was not a bad pupil and he scored good marks in almost every subject.

(c) Where did Einstein attend high school?

Answer:

Einstein attended High School in Munich.

(d) What kind of a school did Einstein wish to join?

Answer:

Einstein wanted to join a school which was more liberal and flexible.

Question 4.

Einstein hated the school's regimentation and often clashed with his teachers. At the age of 15, Einstein felt so stifled there that he left the school for good.

(a) Why did Einstein clash with his teachers?

Answer:

The strict regimentation in the school demanded unquestioning acceptance of the teachers' words. Hence he often clashed with his teachers

(b) When did Einstein leave his school in Munich and why?

Answer:

Einstein left his school in Munich when he was fifteen years of age because he felt completely suffocated by the rigid atmosphere there.

(c) Where did Einstein go after leaving his school in Munich?

Answer:

Einstein went to the German-speaking part of Switzerland, in a more liberal city than Munich.

(d) What does this tell you about Einstein?

Answer:

Einstein had an independent and inquisitive mind and he did not like unquestioning obedience.

Question 5.

Einstein was highly gifted in mathematics and interested in physics, and after finishing school, he decided to study at a university in Zurich. But science wasn't the only thing that appealed to the dashing young man with the walrus moustache.

(a) Where did Einstein want to continue his education? Why?

Answer:

Einstein wanted to continue his education in German-speaking Switzerland because he felt this would be more liberal than Munich.

(b) What were his favourite subjects?

Answer:

His favourite subjects were Mathematics and Physics.

(c) Explain: But science wasn't the only thing that appealed to the dashing young man.

Answer:

Einstein also felt a special interest in a fellow student, Mileva Marie, whom he found to be a "clever creature" and whom he married later.

(d) Why did he see Mileva as an ally?

Answer:

Einstein found in Mileva an ally because she disapproved of the "philistines" or the people who did not like art, literature or music.

Question 6.

He worked as a teaching assistant, gave private lessons and finally secured a job in 1902 as a technical expert in the patent office in Bern. While he was supposed to be assessing other people's inventions, Einstein was actually developing his own ideas in secret.

(a) How did Einstein earn a living before securing a job?

Answer:

Before securing a job. Einstein gave private lessons and worked as a teaching assistant.

(b) When did Einstein secure a job? What was the nature of this job?

Answer:

Einstein secured a job in 1902. This job was in a patent office and Einstein worked here as a technical assistant. In this job he was supposed to assess the inventions of other people.

(c) Why did Einstein develop his ideas in secret?

Answer:

Einstein's job required him to assess the inventions of other people. Therefore, he had to develop his ideas in secret.

(d) Where did he store his inventions? What did he call it?

Answer:

He stored his inventions in his desk drawer at work which he called the "bureau of theoretical physics."

Question 7.

One of the famous papers of 1905 was Einstein's Special Theory of Relativity, according to which time and distance are not absolute.

(a) Explain the term "absolute"

Answer:

The term "absolute" refers to something that is true, right, or the same in all situations and not depending on anything else.

(b) What according to Einstein are not absolute?

Answer:

According to Einstein time and distance are not absolute.

(c) What is described by the formula $E=mc^2$?

Answer:

The relationship between mass and energy is described by this formula. In this formula, 'E' stands for energy, 'm' for mass and 'c' for speed of light in a vacuum.

(d) How did this formula establish Einstein as a scientific genius?

Answer:

This formula, having been proved to be accurate, had become the most famous formula of the world and therefore, Einstein's reputation as a scientific genius was established.

Question 8.

While Einstein was solving the most difficult problems in physics, his private life was unravelling. Albert had wanted to marry Mileva right after finishing his studies, but his

mother was against it. She thought Mileva, who was three years older than her son, was too old for him. She was also bothered by Mileva's intelligence. "She is a book like you," his mother said. Einstein put the wedding off.

(a) Where was Mileva from? Why did she join Zurich University?

Answer:

Mileva was a Serb who had joined Zurich University because it was one of the few places in Europe where women could get degrees.

(b) Why did Einstein's mother oppose his marriage with Mileva?

Answer:

Mileva was three years older than him and very intelligent.

(c) Why did Einstein put the wedding off?

Answer:

Einstein put his wedding off because his mother was against the marriage.

(d) When did Einstein get married to Mileva?

Answer:

He got married to Mileva in 1903.

Question 9.

The pair finally got married in January 1903, and had two sons. But a few years later, the marriage faltered.

(a) Name the couple being talked about?

Answer:

The couple being talked about is Albert Einstein and Mileva Marie.

(b) What happened to their marriage?

Answer:

With the passage of time, their marriage became weak and failed.

(c) Why did their marriage falter?

Answer:

Their marriage faltered because Mileva, who was losing her intellectual ambition, was becoming an unhappy housewife and the couple were constantly fighting.

(d) Whom did Einstein marry later?

Answer:

Einstein later married his cousin, Elsa.

Question 10.

Many of them had fled from Fascism, just as Einstein had, and now they were afraid the Nazis could build and use an atomic bomb.

(a) What does the word 'fascism' mean?

Answer:

Fascism refers to a political system based on a very powerful leader, state control, and being extremely proud of country and race, and in which political opposition is not allowed.

(b) Who does 'they' refer to in the above lines?

Answer:

In the above lines 'they' refers to the American Physicists who had escaped from dictatorship in their parent countries.

(c) When and where had many of them fled from? Why?

Answer:

Many of them had fled to America when the Nazis came to power in Germany. They had to flee their country, because they feared suppression of their liberal ideas by the dictatorial Nazis.

(d) What were they afraid of and why?

Answer:

They were afraid that the discovery of nuclear fission could be developed by Germany to build and use an atomic bomb which could be misused to cause massive destruction.

Question 11.

Einstein was deeply shaken by the extent of the destruction. This time he wrote a public missive to the United Nations In it he proposed the formation of a world government. Unlike the letter to Roosevelt, this one made no impact.

(a) What 'destruction' shook Einstein?

Answer:

When the atom bomb was dropped on Hiroshima and Nagasaki. It caused heavy destruction. Einstein was moved because of the extent of damage to life and environment.

(b) What did Einstein write and to whom?

Answer:

Einstein wrote to the United Nations proposing the formation of a world government.

(c) Who was Roosevelt? Why had Einstein written to him?

Answer:

Franklin Roosevelt was the President of USA. Einstein wrote a letter to Roosevelt in which he warned him by saying, 'a single bomb of this type might very well destroy the whole part with some of the surrounding territory', i.e., a letter warning him about the damage the bomb blast could cause.

(d) How had Roosevelt responded?

Answer:

Taking heed of Einstein's warning, the Americans developed the atomic bomb in a secret project of their own, and dropped it on the Japanese cities of Hiroshima and Nagasaki in August 1945.

Question 12.

Unlike the letter to Roosevelt, this one made no impact. But over the next decade, Einstein got ever more involved in politics – agitating for an end to the arms buildup and using his popularity to campaign for peace and democracy.

(a) What does 'this one' refer to?

Answer:

'This one' refers to Einstein's letter to the United Nations.

(b) Who had written a letter to Roosevelt and why?

Answer:

Einstein had written a letter to President Roosevelt to warn him against the atom bomb that Germany could make on the principle of nuclear fission.

(c) What had Einstein written in 'this one'?

Answer:

The letter written by Einstein to the United Nations spoke about the need for forming a world government to counter destructive acts like the use of atom bombs.

(d) Why did Einstein get more involved in politics?

Answer:

Einstein got more involved in politics because he was a supporter of world peace and harmony and in this manner he launched an agitation to end arms buildup and campaigned for peace and democracy.