

Unit2 2nd Physics



READING PASSAGE: Erwin Schrödinger

Erwin Schrödinger, (born August 12, 1887, Vienna, Austria—died January 4, 1961, Vienna), Austrian theoretical physicist who contributed to the wave theory of matter and to other fundamentals of quantum mechanics. He shared the 1933 Nobel Prize for Physics with British physicist P.A.M. Dirac. Schrödinger entered the University of Vienna in 1906 and obtained his doctorate in 1910, upon which he accepted a research post at the university's Second Physics Institute. He saw military service in World War I and then went to the University of Zürich in 1921, where he remained for the next six years. There, in a six-month period in 1926, at the age of 39, a remarkably late age for original work by theoretical physicists, he produced the papers that gave the foundations of quantum wave mechanics. In those papers he described his partial differential equation that is the basic equation of quantum mechanics and bears the same relation to the mechanics of the atom as Newton's equations of motion bear to planetary astronomy. Adopting a proposal made by Louis de Broglie in 1924 that particles of matter have a dual nature and in some situations act like waves, Schrödinger introduced a theory describing the behaviour of such a system by a wave equation that is now known as the Schrödinger equation. The solutions to Schrödinger's equation, unlike the solutions to Newton's equations, are wave functions that can only be related to the probable occurrence of physical events. The definite and readily visualized sequence of events of the planetary orbits of Newton is, in quantum mechanics, replaced by the more abstract notion of probability. This aspect of the quantum theory made Schrödinger and several other physicists profoundly unhappy, and he devoted much of his later life to formulating philosophical objections to the generally accepted interpretation of the theory that he had done so much to create. His most famous objection was the 1935 thought experiment

that later became known as Schrödinger's cat. A cat is locked in a steel box with a small amount of a radioactive substance such that after one hour there is an equal probability of one atom either decaying or not decaying. If the atom decays, a device smashes a vial of poisonous gas, killing the cat. However, until the box is opened and the atom's wave function collapses, the atom's wave function is in a superposition of two states: decay and non-decay. Thus, the cat is in a superposition of two states: alive and dead. Schrödinger thought this outcome "quite ridiculous," and when and how the fate of the cat is determined has been a subject of much debate among physicists. In 1927 Schrödinger accepted an invitation to succeed Max Planck, the inventor of the quantum hypothesis, at the University of Berlin, and he joined an extremely distinguished faculty that included Albert Einstein. He remained at the university until 1933, at which time he reached the decision that he could no longer live in a country in which the persecution of Jews had become a national policy. He then began a seven-year odyssey that took him to Austria, Great Britain, Belgium, the Pontifical Academy of Science in Rome, and—finally in 1940—the Dublin Institute for Advanced Studies, founded under the influence of Premier Eamon de Valera, who had been a mathematician before turning to politics. Schrödinger remained in Ireland for the next 15 years, doing research both in physics and in the philosophy and history of science. During this period he wrote *What Is Life?* (1944), an attempt to show how quantum physics can be used to explain the stability of genetic structure. Although much of what Schrödinger had to say in this book has been modified and amplified by later developments in molecular biology, his book remains one of the most useful and profound introductions to the subject. In 1956 Schrödinger retired and returned to Vienna as professor emeritus at the university. Of all the physicists of his generation, Schrödinger stands out because of his extraordinary intellectual versatility. He was at home in the philosophy and literature of all the Western languages, and his popular scientific writing in English, which he had learned as a child, is among the best of its kind. His study of ancient Greek science and philosophy, summarized in his *Nature and the Greeks* (1954), gave him both an admiration for the Greek invention of the scientific view of the world and a skepticism toward the relevance of science as a unique tool with which to unravel the ultimate mysteries of human existence. Schrödinger's own metaphysical outlook, as expressed in his last book, *Meine Weltansicht* (1961; *My View of the World*), closely paralleled the mysticism of the Vedanta. Because of his exceptional gifts, Schrödinger was able in the course of his life to make significant contributions to nearly all branches of science and philosophy, an almost unique accomplishment at a time when the trend was toward increasing technical specialization in these disciplines.

Grammar

I- Tenses:

Tenses	Verb To Be	Verb To Have	Used words
Simple Present	.I <u>am</u> / He, She, It <u>is</u> . .We, You, They <u>are</u>	.I, You, We, You, They <u>have</u> . He, She, It <u>has</u>	Always, usually, often, sometimes, never, every...
Simple Past	. I, He, She, It <u>was</u> . -We, You, They <u>were</u>	. I, You, He, She, It, We, You, They <u>had</u>	Yesterday, ago, once, last, this morning, in the past,
Future Simple	. I, You, He, She, It, We, You, They <u>will be</u>	. I, You, He, She, It, We, You, They <u>will</u> <u>have</u>	Tomorrow, soon, next, this evening, in the future..

<p><u>Negation :</u> The rules:</p>	<p>1-With the following auxiliary verbs we use (not) and put them after the auxiliary verb: am, is, are, was, were, has, have, had, can, could, will, would, shall, should, must, may, might.</p> <p>2- With an ending present verb with the letter (s) we use (doesn't) before the verb and delete the (s).</p> <p>3- With the present tense verb not the last (s) we use (don't) before the verb. - With a past tense, we use didn't before the verb and return the verb to the infinitive.</p> <p>4- With the words (sometimes, usually, always) we delete the same word and put (never) instead of it and we don't delete the (s).</p>
<p><u>Ask a question:</u> The rules:</p>	<p>1- Return these auxiliary verbs to the beginning of the sentence (am, is, are, was, were, has, have, had, can, could, will, would, shall, should, must, may, might).</p> <p>2- With a simple present verb at the end of the letter (s), we use (does) at the beginning of the sentence and remove the (s) from the verb.</p> <p>3- With the present verb not the last (s) , we will use (do) at the beginning of the sentence, and the verb remains the same, and we also change the (I) and(We) to (You).</p> <p>4- With a past tense , we use (did) at the beginning of the sentence and return the verb to the infinitive as we convert (my) and (our) to (your).</p>

Examples :	<ul style="list-style-type: none"> - He can swim. / He can't swim. / Can he swim? - Ali travels to London every summer. / Ali doesn't travel to London every summer. / When does Ali travel to London? - I go to the club twice a week. / I don't go to the club twice a week. / How often do you go to the club? - We went to London by plane. / We didn't go to London by plane. / How did you go to London? - She always gets up late. / She never gets up late. - They are playing tennis in the club. / They are not playing tennis in the club. / Where are they playing tennis?
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II-Measurements:

Structures :	Dimensions can be expressed by four structures.	It is 78 m high, or it is 78 m in height, or its height is 78 m, or it has a height of 78 m.
Area:.	To obtain the area, you multiply the length by the width	$100 \text{ cm}^2 = \text{a hundred square centimeters.}$ $(3.14)r^2 = \text{pi r squared.}$ $X^{1/2} = \text{the square root of x.}$
Volume:	To obtain the volume, you multiply the length by the width by the height	$1000 \text{ cm}^3 = \text{a thousand cubic centimeters.}$ $x^3 = \text{x cubed}$ $y^{1/3} = \text{the cube root of y.}$
Power:	It is a mathematical term for the exponent	$X^7 = \text{x to the power seven or x to the seventh.}$ $X^{-7} = \text{x to the power minus seven or x to the minus seventh.}$

III-Pronunciation:

Definition	Example
The two letters gh are not pronounced if the letter I came before them	Night, Right, Fight, High, Flight, Light, Sight.
The letter W is not pronounced if the letter r comes after it	Write, Wrestle, Wrap, Wrong, Writer.
The letter h is not pronounced if it is preceded by the letter m at the end of the word	Climb, Comb, Crumb, Lamb, Limb, Numb.