JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech/ -6th Semester (CSE/IT/BT/ECE/CE)

COURSE CODE (CREDITS): 23B1WHS632 (3) MAX. MARKS: 15

COURSE NAME: History and Philosophy of Science and Technology

COURSE INSTRUCTOR: Ranjith Kallyani MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) Use of calculators is not allowed

Please read the questions carefully and write answer to the questions

Write precisely. Avoid redundant writing

Q.No	Question	CO	Marks
Q1	See two propositions provided below. a) $E=mc^2$ b) $a^2+b^2=c^2$ As you know, the first one is Einstein's mass-energy equivalence. Developed by Albert Einstein in 1905, this formula changed how we understand the physical world. The formula defines the energy (E) of a particle in its rest frame as the product of mass (m) with the speed of light squared (c^2). Because the speed of light is a large number and it is squared, the formula implies that a small amount of mass corresponds to an enormous amount of energy. The second one is the Pythagorean equation which represents a fundamental relation in Euclidean geometry between the three sides of a right triangle. It states that the area of the square whose side is the hypotenuse (the side opposite the right angle) is equal to the sum of the areas of the squares on the other two sides. Based on our contemporary scientific understanding, we can conclude that both propositions are correct. However, the ways we validate their correctness are not the same. How do we know the correctness of these two propositions differently?	CO2	5

PTO

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Q2	**1st Law: Scientific Inertia** An element of a mosaic maintains its state in the mosaic unless replaced by some other elements. **2nd Law: Theory Acceptance** A theory becomes accepted into a mosaic only if it satisfies the mosaic's acceptance criteria or can become accepted if assessment is inconclusive. **3rd Law: Method Employment** A method becomes employed in a mosaic only when it is deducible from some subset of other elements of the mosaic. **0th Law: Compatibility** Two elements become compatible within a mosaic only when they satisfy the mosaic's compatibility criteria. Provided above are four fundamental laws of scientonomy. Consider them as four axioms and develop a theorem about theory rejection as deduced from selected axioms.	CO1	5
Q3	In biology today, the accepted theory of evolution is known as the modern synthesis which has been accepted into the mosaic since the middle of the twentieth century. Two central sub-theories of the modern synthesis are "evolution results from changes in gene frequencies in populations of organisms," and "populations adapt to their environments by natural selection." Within the last 30 years or so, even strong proponents of the modern synthesis have begun to agree that these two sub-theories are inadequate, and that the modern synthesis struggles to account for well-known biological phenomena such as epigenetics, niche construction, and phenotypic plasticity. Despite this building dissatisfaction, however, the modern synthesis remains the accepted theory in contemporary biology. Why? Which law can explain this? (you may refer the four laws provided in Q2).	CO3	5