(1)

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Exam:- CA-3
Subject: Biology

1) d) Virus
2) a) Cells
3) c) Darwin
4) c) louis Pasteur
5) a) Natural history
6) c) Eyeball
7) a) focal length of lenses
8) b) Inverted
9) d) All the above
10) b) Lift force
11) d All the above
12) a) Minimum Energy
13) b) Mechanics
14) a) frame work of the classical physical science
15) d) Julius Mayer
16) b) Einstein

Ans (1) The observations made by Julius Robert von Mayer in the 1840s led to his independent discovery of the mechanical theory of heat. Mayer's key observations and contributions include

(i) Conservation of Energy:- Mayer observed that during muscular activity, the human body did not lose a significant amount of weight, even though it generated heat.

(ii) Work and Heat: Mayer recognized that when a muscle performed work, such as lifting a weight, the work done was equivalent to the work done was equivalent to the heat generated

Ans

2) Robert Brown, a Scottish botanist, made a significant observation in 1827, known as "Brownian motion". He observed the erratic, random motion of tiny particle suspended in a fluid. This motion appeared to be unpredictable and continious, even through the particles were not subject to any visible external force

(i) Molecular collisions.

(ii) Statistical Description

(iii) Mathematical Model.

Ans

(3) Life as we know it relies heavily on enzymes for several critical reasons:

1) Catalysis of chemical Reactions:

Enzymes are biological catalysts that accelerate chemical reactions in living organisms. They do this by lowering the activation energy required for reactions to occur.

2) Specificity: Enzymes are highly specific in their actions. Each enzyme is designed to catalyze a particular chemical reaction or a group of closely related reactions.

Ans→

(4)

Hierarchy in nature, often referred to as a "hierarchical organization," is a common phenomenon observed across various biological, ecological, social systems.

There are several reasons why hierarchy is prevalent in nature:

1) Efficiency: Hierarchy can increase the efficiency of resources allocation and energy flow within a system. In biological systems, hierarchical structures can optimize the distribution of nutrients, energy and information

2) Specialization:- Hierarchy allows for specialization of functions. In complex system, different components or organisms can specialize can enhance the overall functionalize and adaptability of the system.