AI and the Blockchain (15 marks)

- **Discuss whether Bitcoin is Turing Complete**

At this time, loops cannot be enabled using Bitcoin scripts. As a result, they are not believed to be Turing Complete by the majority of people. This restricts the sorts of algorithms that Bitcoin scripts may perform to those that are either linear or tree-like in nature (Benko, 2009).

We have empirically established that every Turing computer can be emulated on Bitcoin, and as a result, we have absolutely proven that Bitcoin is Turing-complete. On the Bitcoin Blockchain, we have deployed an implementation of a Turing machine that is able to identify correctly balanced parenthesis.

Turing Completeness and Cryptocurrency

We are now living in a period of rapid technological growth, and as a result, everything is subject to transformation as new technologies are introduced. Our day-to-day lives have been transformed, and the options available to us as a result of technological advancements, regardless of whether you are thinking about our living standards, investment criteria, or anything else. As is well knowledge, the notion of a Blockchain investment portfolio, Turing completeness, and cryptocurrencies are the most recent crazes in the cryptocurrency field. As a result, there are a variety of perspectives to investigate, debate, and investigate more.

Let's do some digging to find some facts that will help us comprehend the Turing completeness process, the function of the Turning machine, different programming languages, the Blockchain, cryptocurrencies, and a great deal more (Bhbosale, 2020).

Turing Completeness

Understanding Turing completeness is not particularly difficult for those who work in the field of data comprehension and computing. To be more specific, Turing completeness refers to a data manipulation system that can read complicated databases by using a straightforward collection of information, often the Turing machine. This allows the system to understand programming language. Turing machines are useful not just for finding solutions to problems but also for calculating complex data systems, which the human mind is often unable to comprehend. In the same way as calculators make it possible for people to quickly do difficult computations, Turing machines make it possible for people to read and comprehend complicated data systems (Chan, 2019).

Above all other things, the unique collection of instructions and data commands are the most difficult to decode without the assistance of the Turing machine. These kind of gadgets, which are

able to manipulate data, are referred to be Turing-complete. When discussing the world of cryptocurrencies, Ethereum is referred to be a Turing-complete system. There is a kind of tape, and Blockchain technology itself used to be Turing-complete so that language difficulties could be solved (Chien, 2020).

- **Discuss what role blockchain might play working with Al in the future**

It is possible to utilize Blockchain technology to safely and effectively transmit user data across different platforms and systems. Additionally, the technology may be used to save and safeguard records of real estate ownership, titles, and other related information (Chowdhury, 2012).

The way we deal with data is being improved thanks to the combination of artificial intelligence and Blockchain technology. In order to confirm the legitimacy of a transaction, computers analyze encrypted data by cycling through several possible character permutations until they find the right combination. In a manner analogous to that of a human hacker, AI picks up new knowledge and hones its abilities with each successful code break. However, in contrast to a human, artificial intelligence will not need a whole career to achieve expert status. It is possible for it to occur very rapidly with the correct training data (Davenport, 2019).

- **The difference between AI and General Al**

AI	**General AI**
Instead than focusing on precision, Al strives to improve one's overall level of success.	Comparable to the intellect of humans.
It operates much like a computer program, and it does its tasks quite intelligently.	Alternately referred to as strong AI or complete AI.
The purpose of this is to challenge Al's innate intellect, which is necessary for dealing with difficult issues.	Has human-like cognitive ability as well as a human-like consciousness.
Al's participation in the decision-making process Al's goal is to identify the most effective response.	Still in the process of being made actual.
Al is the path to attaining intelligence or wisdom, both of which are attainable **(Davenport, 2019)**.	Can solve unknown situations and Comparable to the intellect of humans (Chien, 2020).

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