Assignment 4: Refining Operational Definitions

1. **Establishment:** An organization, institute or agency dedicated to promoting and advancing the development and application of science, technology, and innovation.
2. **Scientist:** A scientist is an individual who systematically gathers and uses research and evidence, explores their curiosity, and employs scientific methods to understand, describe, and predict the natural world.
3. **Technician:** A technician is a skilled professional who applies their expertise in a field to the design, development, installation, maintenance, and repair of various systems and products.
4. **Engineer:** An engineer is an individual who uses their technical and scientific expertise to plan, design, build, and maintain systems, structures, machines, processes, and products that solve real-world problems and meet the needs of society.
5. **Product:** A product is an item, system or service that results from scientific and technological research and innovation, which satisfies a need or demand for a customer.
6. **Science:** Science is the systematic and logical process of acquiring knowledge and understanding the natural world through observation, experimentation, and analysis of data.
7. **Technology:** Is the tools, methods, systems, and devices aimed at solving practical problems and improving the quality of life developed through practical application of scientific knowledge.
8. **Innovation**: Innovation is the process of creating entirely new products, services, or ideas and refining of existing ones.

9. **Laboratory**: A laboratory is a controlled environment where scientific research, experiments, measurements, and technological advancements are performed.
10. **Process**: A process is a set of repeatable steps or actions that are performed to achieve a specific result.
11. **Research:** Research is the systematic and in-depth investigation of a subject or phenomenon to gain new knowledge, solve problems, or answer questions.
12. **Space:** Space is the vast, three-dimensional expanse that exists beyond the Earth's atmosphere and contains all matter and energy, including planets, stars, galaxies, and the universe itself.
13. **Space Science:** Space science is a branch of science that studies the physical and natural phenomena of the universe beyond the Earth's atmosphere.
14. **Navigation:** Is the process of determining the position and directions of an object, and guiding it from one place to another
15. **Navigation system**: Navigation system is a system of technologies and techniques used to determine the position, orientation, and movement of an object, typically a vehicle, and to guide it towards a desired destination.
16. **Satellite:** A satellite is a device designed to be launched into space and to revolve around the Earth or other celestial body for the purpose of communication, navigation, weather forecasting, or scientific research.
17. **Earth Observation**: Earth observation is the gathering of information about planet Earth's physical, chemical, and biological systems via remote sensing technologies, usually involving satellites carrying imaging devices.
18. **Aerospace:** Aerospace is the atmosphere and outer space, encompassing the design, development, testing, and production of aircraft, spacecraft, and related systems and equipment, with a focus on problems related to

atmospheric and space flight.

19. **Astronautics:** Astronautics is the science and branch of engineering concerned with the construction and operation of vehicles for travel in space beyond the Earth's atmosphere.
20. **Aeronautics:** Aeronautics is the discipline dedicated to the study, design, and manufacturing of mechanical devices that can be lifted in flight.
21. **Industry 4.0 (The Fourth Industrial Revolution)**: Is the ongoing development and integration of advanced technologies into the manufacturing and other industries, leading to a new era of smart factories, interconnected systems, and innovative products and services
22. **Smart factory:** A Smart Factory is a highly advanced and automated manufacturing facility that utilizes cutting-edge technologies to optimize production processes, improve efficiency, increase flexibility, and create a more opportunistic system for companies in manufacturing and supply chain management.
23. **Internet of Things (IoT):** IoT is the interconnectivity of everyday devices and objects through the use of technology, allowing for the exchange of data and information between these devices over the internet.
24. **Nanotechnology:** Nanotechnology is the understanding and control of materials on the atomic or molecular scale.
25. **Artificial Intelligence (AI):** Artificial Intelligence (AI) is a branch of computer science that deals with the simulation of human intelligence in machines.
26. **Machine Learning (ML):** Machine learning is a subfield of artificial intelligence (AI) that deals with the design and development of algorithms and statistical models that enable computers to learn from data and make decisions based on that learning, without being explicitly programmed to do so.

27. **Cyber-Physical Systems (CPS)**: CPS is the integration of physical devices, with computing and communication systems to create a seamless and integrated system.

28. **Big Data:** Big Data is the large and complex datasets characterized by volume, velocity, and variety, with the data being too large or complex to be dealt with by traditional data processing software.

29. **Additive Manufacturing**: Additive Manufacturing is the creation of a three-dimensional object by building it layer by layer through the joining or solidifying of materials under computer control, either through the fusion of liquid molecules or by adding powder grains together.

30. **Blockchain:** Blockchain is a decentralized, shared, immutable ledger that uses a chain of blocks to record transactions across a network of computers.

31. **Digital Economy – E-Trade:** It is the production and consumption of goods and services through digital channels and the use of digital technologies to improve the efficiency and effectiveness of traditional economic activities.

32. **Cyber Security:** Is the application of technologies, processes, and controls to protect systems, networks, programs, devices and data from cyber-attacks.

33. **Bureau:** A bureau is an administrative unit within STI secretariat responsible for promoting and supporting research and development aimed at advancing science led social economic transformation in the country.

34. **Industrial Value Chain**: The industrial value chain is a set of interconnected and interdependent activities that are involved in the creation, production, and delivery of a product or service.

35. **Infrastructure**: Infrastructure is the technical systems, facilities and structures that are designed and built to support and sustain human activities and operations.

36. **Research**: Research is the systematic and in-depth investigation of a subject or phenomenon to gain new knowledge, solve problems, or answer questions.

37. **Services:** Services are intangible offerings that involve the performance of tasks, responsibilities or functions, and the delivery of benefits or experiences that meet the needs, wants or expectations of customers or clients.

38. **Support services:** Support services are a range of non-core functions necessary for the smooth operation and maintenance of an organization, business, or individuals.

39. **Administration:** Administration is the coordination, directing, and control of resources to achieve desired objectives for an organization, institution, or country.