CHAPTER 10

1. How can Futuristic Technology be defined?

   Futuristic technology is an innovative development in the different fields of ict called information and computer technology. As futuristic technology advances, it makes our lives and our jobs easier. With the help of modern technology people become more productive because through technology it makes things easier to do. These technologies can appear in different methods such as manufacturing, aeronautics and many others. ICT is one of the most influential in the development of futuristic technology. In the field of automobile and engineering ICT can change traditional processes, such as designing modern cars. Futuristic technology is an evolution because many new devices will be invented through technology.

2. Which are the top Futuristic Technologies?

   The top Futuristic Technologies are 3D Printing Technology, 6G Technology, Autonomous Robots, Artificial Neurons, Artificial General Intelligence (AGI), Mind Uploading, Driverless Vehicles, Infrastructure Hacking, Regenerative Medicine, Digital Twin (DT) Technology, Programmable Living Robots, Human Augmentation, Intelligent Process Automation (IPA), Space Elevator, Rotating Skyhook, and Light Sail.

3. How did 3D printing begin?

   3D printing is also known additive manufacturing. 3D printing began in 1940s the idea of the scientist name Murray Leinster he introduced the idea of 3D printing. In the 1950s, Raymond Jones discussed the concept of molecular spray in a science fiction magazine article titled "Tools of the Trade." In early development in 1970 t0 1980s in 1971 the liquid metal recorder was patented by Johannes Gottwald.1974 david jones introduced the concept of 3D Printing in new scientist journal. In the time of 1980s Two additive methods of fabricating 3D plastic models introduced by Hideo Kodama. Bill Masters patented the Computer Automated Manufacturing Process in 1984, which helped progress 3D printing technology. Bill Masters patented Computer Automated Manufacturing Process in 1984. In 1984, Alain Le Mehaute and his colleagues filed a patent application for stereolithography technologies. Emanuel Sachs of the MIT Institute devised the powder bed method utilizing a bespoke inkjet print head in 1993. The Fraunhofer Society invented the selective laser melting technology in 1995. Adrian Bowyer started the open-source project RepRap in 2005. Under this project, a 3D printer was developed in 2008, and the first replication of the newly manufactured machine, named "Darwin," was completed. 2009—After the fused deposition manufacturing (FDM) patent expired, multiple companies arose as part of the RepRap open-source initiative for FDM manufacturing. 2010—Metal working was completed for the first time. Before The majority of the procedures dealt with plastic and polymer materials. 2016 The first LEAP engine with 3D printed fuel nozzles General Electric produced this product for the Airbus Corporation. In 2021, Steve Verze received a fully 3D printed prosthetic eye at Moorfields Eye Hospital in London.

4. What are the applications of 3D printing?

   Manufacturing industry, Fashion industry, Firearm industry, Healthcare industry, Transportation and aviation industry, Culture heritage industry, Education and training sectors.

5. In what ways does 6G technology differ from other technologies?

   6G technologies are one of the fastest emerging in the year 2030. 6th generation cellular wireless network standard will use millimeter waves in the range of 30-300 GHz and 300-3000 GHz faster than 5g technology. It is also supported by advanced ICT technologies of the virtual machine in real time (VR/RT) and many others. It is 5 times faster than 5g technology. 6g is supported AI programs in real time similar to driverless cars powered by artificial intelligence.

6. What is the need for 6G technology?

   The needed for 6G technology are the convergence of technology, Incorporation of high performance computing (HPC), Internet of Things (IoT) network and Mobile Edge computing. The collaboration of multiple technologies with the advent of 6G technology will enable more convergence. With the advent of 5G technology, there is a possibility of 6G technology that will match 5G in terms of speed and efficiency in information processing, The growth of IP-enabled devices in Internet of Things (IoT) networks also necessitates significant bandwidth and high-capacity network connections. And High-performance computing (HPC) services cannot be efficiently integrated with quantum computing using the technology available today. These advanced computer applications require large bandwidths and data channels.

7. What is a data center?

   A data center is a type of building where computer systems and associated parts like storage and telecommunications are kept. And various security mechanisms are examples of these. Large amounts of data that are utilized by businesses for a variety of purposes, such as business operations, storage, and analysis, stored, processed, and managed, which requires the use of data centers

8. What is an autonomous robot?

   The Autonomous robots are intelligent machines that can do things without any human interaction. They are able to do what they have to do through their intelligence from a computer visions and the data that is set to them. It is used in different ways around the world just like robots are used in companies.

9. What are autonomous mobile robots (AMRs)?

   The autonomous mobile robot or AMRs, can operate by itself without the help of any person. Task operated and self-maintaining machine. AMRs are used in a large number of industries and other applications. Dangerous tasks can be done by autonomous robots and they do it perfectly. AMR has two major types of navigations in modern industries, it is any and indoor navigation and outdoor navigations.

10. In what sense are Artificial Neurons useful?

    Artificial neurons have several applications, but their main benefit is that they can process and analyze data similarly to biological neurons in the human brain since they act similarly to those neurons. Artificial neurons are beneficial because of their capacity for data processing and decision-making.

11. What are AGI and ASI?

The technology known as artificial intelligence (AI) is a very advanced and expansive field that is still developing. Artificial intelligence has not yet reached its full potential. Artificial intelligence can be categorized into three the Artificial narrow intelligence (ANI), Artificial general intelligence (AGI) and Artificial super intelligence (ASI. The ASI it is the most advance form of artificial intelligence it is powerful and most genius brains on the earth.

12. Why is Digital Twin (DT) technology Important?

Digital Twin (DT) is very important because its helps the industries save the prototyping cost and operational failures of products and processes significantly and it offers a powerful toolset for improving efficiency, reducing costs, enhancing decision-making, and driving innovation across industries.

CHAPTER 11

1. How do modern technologies impact cybersecurity?

Modern technologies impact cybersecurity by expanding the threat surface, providing more opportunities for hackers to exploit vulnerabilities in software and systems. The use of emerging technologies with security loopholes increases the risk of cyber-attacks. The growing number of devices and communication protocols creates more entry points for hackers. Operations and maintenance become challenging, making it difficult to upgrade and secure devices. Weak communication protocols and lack of user awareness contribute to cybersecurity risks. Compatibility issues and advanced hacking tools increase the threat landscape.

2. How are the advanced technologies affecting cybersecurity?

Cybersecurity has changed as a result of advanced technologies, posing both benefits and difficulties. Attack surfaces grow due to IoT and BYOD, AI makes sophisticated threats possible, data privacy issues appear, and regulatory compliance gets more difficult. Cybersecurity is made more difficult by insider threats and a lack of qualified personnel. For organizations to effectively reduce risks, they must implement comprehensive strategies.

3. Extensive data exposure: what are the risks?

The risk in extensive data exposure is that there is a huge shortage of cybersecurity professionals to counter them, the chances of extensive data exposure will remain very high. With the excitement of newer technologies among both the users and providers, the situation is becoming more precarious for extensive data exposures and data breaches.

4. Is there a strategy for controlling cyber breaches?

Yes, there are strategies for controlling cyber breaches like conducting regular risk assessment to view the vulnerabilities. Prioritize the security and keep the systems up to date with latest security updates.

5. What is the reason for the shortage of cybersecurity professionals?

It is another impact of emerging technologies, which is the shortage of cybersecurity professionals. There are about 3,000,000 experts and specialists short of the requirements in this

field. Thus, the impact of modern technologies on different entities-business and governmental-is the shortage of cybersecurity professionals, experts, and specialists.

6. What impact do cyber-attacks have on businesses?

   The scale of damages caused by the cybersecurity threats in the world is huge in trillions a year. To avert or reduce the impact of that huge devastation, businesses focus on investing hugely on the cybersecurity to maintain a robust and reliable security level to avoid any kinds of damages caused by the cyber attacks. Additionally, businesses are badly impacted with the burden of huge amount of money, which is spent on maintenance and enhancement of the cybersecurity systems and professionals.

7. What are the main reasons for data exposure?

   The main reasons of data exposures pertaining to modern and innovative technologies include the following:
   • Use of huge number of devices in highly diverse environments of loT where a large number of devices run diverse firmware and software.
   • Increased number of user accounts with those huge number of devices and related services are also prone to data exposure.
   • Mismanagement in password creation, maintenance, and storage by the clients.
   • Outdated software and devices that are not updated regular also exaggerate the situation.
   • Continual emergence of innovative techniques and ways that people are not fully expert at.

8. What is Risk?

   Risk is the increased possibility of cyber-attacks and potential harm resulting from Expanding threat surface, Security vulnerabilities in emerging technologies, Operational and maintenance challenges ,Weak communication protocols ,Lack of user awareness, Compatibility issues and Utilization of advanced hacking tools

9. How can cybersecurity affect national security?

The main impacts of a cybersecurity that can lead to national security issues include the following:
•Economic loss from major businesses, affecting national stability.
•Theft and manipulation of data, endangering individuals and country.
•Creation of panic and social disturbances through exploitation of vulnerable data.
•Stirring political chaos using sensitive information from cyber attacks.
•Disruption of economic, political, and social activities, damaging community harmony.

Also, Cybersecurity threats can directly impact national security by targeting and stealing sensitive data, secrets, and assets. These attacks can be used by adversaries to inflict damage on a country's security. Additionally, cyberattacks on utilities and civic services can create chaotic conditions that enable dangerous activities and designs by exploiting the resulting vulnerabilities.

10. What is Zero trust policy?

    zero trust policy is like an organization does not automatically trust anything that is inside or outside of its network perimeter. Zero Trust is a cybersecurity architecture that is founded on the idea of "never trust, always verify."