SNS COLLEGE OF TECHNOLOGY
(Autonomous)
MCA- Internal Assessment –III (August 2023)
Academic Year 2022-2023(EVEN) / SecondSemester
19CAE721– Ethics in Computing
Answer Key
SET - B
PART – A

1. Illustrate the benefits of online virtual world

Accessibility: Specially-abled people can use virtual reality to access and interact with environments and experiences that are difficult or impossible in the real world.

Cost-effectiveness: One of the advantages of VR is that it can be a cheaper way to learn than traditional methods, like simulations or field trips. You don't have to spend money on travel when you use VR

2. Outline about Online Spoofing
A spoofing scam might be an email, text message or phone call that appears to be from a trusted source, like a loved one or even a popular brand. But in reality, a fraudster is behind the fake email address or phone number, hoping to convince you to download malicious software, sends money or share personal information or data with them.

3. Analyze various accessibility issues in computer technology
1. Insufficient Color Contrast
2. Lack of keyboard access
3. Lack of visible or obvious focus
4. Lack of image descriptions
5. Improperly labeled controls

4. Define Green computing
The convergence of business, information technology (IT), the environment, and green computing is a complex and dynamic field that addresses how organizations can use technology to minimize their environmental impact while achieving business goals. Green computing is a significant aspect of this intersection, as it focuses on making IT operations more sustainable and energy-efficient.

5. What are the steps involved in measuring carbon foot print?
1. Identify scope and boundaries
2. Gather data
3. Convert data to CO2
4. Calculate emission
5. Sum up emission
6. Interpret Results
7. Compare to benchmarks
8. Identify Reduction opportunities
9. Set Reduction target
10. Monitor and update

6. a) Explain some examples of crime in virtual world.

Crime in online virtual worlds refers to illicit activities or actions that violate the rules, norms, and regulations established within those digital environments. Just like in the real world, virtual worlds can experience various forms of criminal behavior. Here are some examples of crimes that can occur in online virtual worlds:

1. Theft and Scams: In virtual worlds with economies, individuals may engage in theft by stealing virtual items, currency, or resources from other players. Scammers might deceive players into giving away valuable items or personal information under false pretenses.

2. Virtual Goods Fraud: Criminals might set up fake shops or auction houses in virtual worlds, selling counterfeit or non-existent virtual items. This can lead to players losing their virtual currency or valuable possessions.

3. Hacking and Unauthorized Access: Criminals may attempt to hack into players' accounts, gaining unauthorized access to their avatars, virtual goods, and personal information.

4. Harassment and Cyber bullying: Online virtual worlds are not immune to harassment and cyberbullying. Players might experience offensive messages, threats, or other forms of abusive behavior.

5. Impersonation: Criminals can create fake avatars or profiles impersonating others, leading to identity theft, false information spread, and reputation damage.

6. Cheating and Exploits: Players may use cheats, hacks, or exploits to gain unfair advantages in games or competitions, disrupting the fair play and integrity of the virtual world.

7. Virtual Property Disputes: Disputes might arise over ownership of virtual property, such as in-game real estate or items. Some players might resort to fraudulent means to claim ownership of another player's assets.

8. Virtual Currency Laundering: Criminals might use virtual worlds to launder money by converting illicitly obtained real-world funds into virtual currencies, which can then be converted back into clean funds.

9. Defamation and Libel: False statements, rumors, or malicious comments about other players can lead to defamation or libel cases, damaging a player's reputation.

10. Real-World Threats: In extreme cases, virtual disputes can escalate to real-world threats, including doxxing (revealing personal information) and even physical harm.

b) Determine in detail about the phases of SDLC

Software development is the process of designing, creating, testing, and maintaining computer programs or applications. It involves a series of systematic steps aimed at producing high-quality software that meets specific user requirements. Software development can encompass a wide range of activities, from writing code to project management and quality assurance. Here's a breakdown of the key aspects of software development:

1. Requirements Gathering: The first step involves understanding the needs and expectations of the users or stakeholders. This involves gathering detailed information about the software's purpose, functionality, features, and user interactions. Clear and comprehensive requirements provide a solid foundation for the development process.

2. Design: In this phase, developers create a blueprint for the software, outlining how it will be structured and how different components will interact with each other. This includes high-level architecture, user interface design, and database design if applicable.

3. Implementation (Coding): Developers write the actual code based on the design specifications. This is where the software's functionality is built using programming languages like Java, Python, C++, and others. Best practices and coding standards are followed to ensure the code is readable, maintainable, and efficient.

4. Testing: Testing is a crucial phase to identify and rectify any defects or issues in the software. Various testing methodologies are employed, including unit testing (testing individual components), integration testing (testing

interactions between components), and system testing (testing the entire software). Automated testing tools may also be used to streamline the process.

5. Debugging: When issues are identified during testing, developers go through the process of debugging, which involves locating and fixing the root cause of the problems in the code.

6. Deployment: Once the software is deemed stable and free of critical issues, it's deployed to the production environment where users can access and use it. This might involve setting up servers, databases, and other infrastructure components.

7. Maintenance and Updates: After deployment, the software requires ongoing maintenance to address any bugs, improve performance, and add new features. Regular updates and patches ensure that the software remains relevant and functional over time.

8. Agile and DevOps: Modern software development often follows Agile methodologies, which emphasize iterative development and close collaboration between developers, testers, and stakeholders. DevOps practices integrate development and IT operations to automate and streamline the deployment process, leading to faster and more reliable software releases.

9. Version Control: Version control systems like Git help manage changes to the codebase, enabling multiple developers to work simultaneously on different features or fixes without conflicts. This also allows teams to track changes and revert to previous versions if necessary.

10. Documentation: Proper documentation is essential for understanding the software's architecture, functionality, and usage. It aids in onboarding new developers, troubleshooting, and maintaining the software over its lifecycle. Software development can take various forms, including web development, mobile app development, desktop application development, and more. It's a dynamic field that constantly evolves with new technologies, methodologies, and tools, all aimed at improving the efficiency and quality of the software development process.

7. a) Why green computing? Evaluate how the Green computing strategies are beneficial to an Organization?

Green IT, also known as Green Information Technology or Sustainable IT, refers to the practice of designing, using, and managing information technology resources in an environmentally responsible and energy-efficient manner. The aim of Green IT is to minimize the negative impact of information technology on the environment while optimizing its efficiency and sustainability. Here are some fundamental principles and practices of Green IT:

1. Energy Efficiency: One of the central goals of Green IT is to reduce energy consumption in IT operations. This includes using energy-efficient hardware, optimizing data centers for cooling and power distribution, and employing power management strategies to ensure devices are not consuming unnecessary energy.

2. Virtualization: Virtualization involves running multiple virtual servers or desktops on a single physical machine. This technology helps consolidate hardware, reducing the number of physical devices needed and thus lowering energy consumption.

3. Cloud Computing: Cloud computing allows for resource sharing and dynamic allocation, which can help optimize hardware utilization and reduce the need for individual organizations to maintain large amounts of on-premises infrastructure.

4. E-Waste Management: Green IT promotes responsible disposal and recycling of electronic waste (e-waste). This includes proper disposal of old devices, components, and electronic equipment to minimize their negative impact on the environment.

5. Renewable Energy: Utilizing renewable energy sources such as solar, wind, or hydroelectric power for data centers and IT operations can significantly reduce the carbon footprint of IT infrastructure.

6. Lifecycle Management: Considering the entire lifecycle of IT equipment—from manufacturing and usage to disposal—is essential. Choosing products with longer lifecycles, upgrading instead of replacing, and properly recycling old equipment are important components of Green IT.

7. Paperless Initiatives: Implementing digital document management, electronic communication, and online collaboration tools can reduce the need for paper and decrease paper-related waste.

8. Remote Work and Telecommuting: Supporting remote work and telecommuting can help reduce the need for daily commutes, leading to lower fuel consumption and reduced greenhouse gas emissions.

9. Energy-Efficient Hardware: Opting for energy-efficient hardware components such as processors, memory modules, and storage devices can contribute to overall energy savings.

10. Green Data Centre Design: Designing data centres with energy-efficient cooling systems, efficient layout, and proper airflow management can minimize energy usage and improve overall efficiency.

11. Lifecycle Assessment: Assessing the environmental impact of IT products and services throughout their entire lifecycle, from raw material extraction to disposal, helps identify areas for improvement.

12. Awareness and Training: Educating IT professionals and users about the importance of Green IT and energy-efficient practices can lead to more conscious decision-making.

13. Government Regulations and Standards: Following environmental regulations and industry standards related to IT equipment and operations can help guide Green IT initiatives.

Implementing Green IT practices not only helps protect the environment but also often leads to cost savings, improved operational efficiency, and enhanced corporate social responsibility. By adopting sustainable IT practices, organizations can contribute to a more environmentally friendly and energy-efficient digital landscape.

b) Illustrate the significance of business environment towards Green computing.
BUSINESS, IT AND THE ENVIRONMENT
The intersection of business, information technology (IT), and the environment is a critical area that has gained increasing attention due to concerns about sustainability, energy consumption, and the environmental impact of technological advancements. Organizations are recognizing the need to align their business strategies and IT practices with environmental sustainability goals. Here are some key aspects of the relationship between business, IT, and the environment:

1. Green IT and Energy Efficiency: As discussed earlier, Green IT focuses on reducing energy consumption and minimizing the environmental impact of IT operations. Energy-efficient hardware, data center optimization, virtualization, and cloud computing are strategies that help organizations reduce their carbon footprint and operational costs.

2. Data Centers and Energy Use: Data centers, which house servers and IT infrastructure, consume significant amounts of energy for cooling and power. Optimizing data center design, using energy-efficient cooling systems, and adopting advanced cooling technologies can lead to substantial energy savings.

3. Digital Transformation and Sustainability: Many businesses are undergoing digital transformation, adopting advanced technologies like artificial intelligence, big data, and the Internet of Things. While these technologies offer numerous benefits, they can also increase energy consumption. Therefore, integrating sustainability considerations into digital transformation strategies is crucial.

4. Eco-Friendly Hardware: Organizations are increasingly opting for eco-friendly and energy-efficient hardware when making IT procurement decisions. This includes selecting devices with certifications like ENERGY STAR and considering the environmental impact of manufacturing and disposal.

5. Remote Work and Telecommuting: The rise of remote work and telecommuting, accelerated by global events such as the COVID-19 pandemic, has implications for both business operations and the environment. Remote

work can reduce the need for office space and commuting, leading to lower energy consumption and carbon emissions.

6. Sustainable Supply Chain Management: Businesses are extending their sustainability efforts to their IT supply chains by partnering with suppliers that prioritize environmentally responsible practices. This includes considering the environmental impact of IT components and materials.

7. Digital Waste and E-Waste: The rapid pace of technological advancement leads to digital waste, including obsolete devices and electronic equipment. Organizations need to manage e-waste responsibly through proper disposal and recycling methods to prevent environmental harm.

8. Data Privacy and Security: The energy required to manage and secure large volumes of data is a concern. Businesses must ensure that their data protection measures align with their environmental goals while maintaining high levels of security.

9. Environmental Reporting and Transparency: Many organizations are incorporating environmental metrics, including IT-related ones, into their sustainability reporting. This allows stakeholders to understand the organization's efforts in reducing its environmental impact.

10. Regulations and Compliance: Governments and regulatory bodies are introducing stricter environmental regulations and standards. Businesses must ensure that their IT practices and systems comply with these regulations to avoid penalties and reputational damage.

11. Innovation for Sustainability: Businesses are increasingly investing in innovative IT solutions that address environmental challenges. For example, smart grid technologies, renewable energy management systems, and predictive analytics for resource optimization contribute to sustainability efforts.

Striking a balance between business growth, technological advancement, and environmental sustainability requires careful consideration and planning. Organizations that proactively integrate green practices into their business and IT strategies can not only reduce their ecological footprint but also improve operational efficiency, enhance brand reputation, and contribute to a more sustainable future.

8. a) Analyze various social networking issues in detail

Social networking platforms have introduced a range of ethical issues that impact users, society, and even the platforms themselves. These issues often arise due to the rapid evolution of technology and the widespread adoption of social media. Here are some prominent ethical issues associated with social networking:

1. Privacy Concerns: The most common ethical issue involves privacy violations. Users often share personal information, and there's potential for unauthorized access, data breaches, and misuse of personal data for targeted advertising or other purposes.

2. Data Security: With the large amount of personal information stored on social networking platforms, ensuring strong data security is crucial. Breaches can lead to identity theft, financial fraud, and other harmful consequences.

3. Cyber bullying and Harassment: Social media can be a platform for cyber bullying, harassment, hate speech, and threats. The anonymity and distance provided by online interactions can lead to harmful behaviors.

4. Fake News and Misinformation: The rapid sharing of information on social networks can lead to the spread of false information, rumors, and misinformation, which can influence public opinion and even have real-world consequences.

5. Online Trolling: Trolling involves deliberately provoking or harassing others online, often for the purpose of getting a reaction. It can contribute to a toxic online environment.

6. Addiction and Mental Health: Excessive use of social media can contribute to addiction, social isolation, and negative impacts on mental health, including feelings of inadequacy due to comparisons with curate online personas.

7. Filter Bubbles and Echo Chambers: Algorithms on social networks can create filter bubbles, showing users content that aligns with their existing beliefs. This can lead to echo chambers, where users are exposed only to reinforcing viewpoints.

8. Online Impersonation: Fake accounts and impersonation are common issues on social platforms. Identity theft and manipulation can lead to confusion and harm to individuals' reputations.

9. Digital Footprint: Content shared on social media leaves a digital footprint that can have long-lasting impacts on an individual's personal and professional life.

10. Lack of Transparency: Social media platforms' algorithms and content curation practices are often opaque, making it difficult for users to understand why certain content is shown to them.

11. Copyright and Intellectual Property: The ease of sharing content on social media can lead to copyright infringement and the unauthorized use of intellectual property.

12. Exploitation of User Data: Some platforms collect extensive user data for advertising purposes without users fully understanding the implications.

13. Censorship and Free Speech: Platforms often grapple with the balance between allowing free speech and preventing hate speech, harassment, and incitement to violence.

14. Ethical Design: The way platforms are designed, including features that encourage addiction or amplify extreme content, raises questions about ethical design choices.

15. Digital Divide: The unequal access to technology and social media can contribute to a digital divide, where certain groups are excluded from online discussions and opportunities.

Addressing these ethical issues requires a collective effort from users, platform developers, policymakers, and society at large. Responsible use, transparent platform practices, clear regulations, and ongoing dialogue are essential for creating a more ethical and responsible social media environment.

b) Case study on green computing: Green software & its characteristics, awareness, ratings and challenges

The convergence of business, information technology (IT), the environment, and green computing is a complex and dynamic field that addresses how organizations can use technology to minimize their environmental impact while achieving business goals. Green computing is a significant aspect of this intersection, as it focuses on making IT operations more sustainable and energy-efficient. Here's how these elements interact and influence each other:

1. Business Goals and Environmental Responsibility

2. Green Computing for Sustainable Business

3. Energy-Efficient Data Centers

4. Cloud Computing and Sustainability

5. Remote Work and Eco-Friendly Practices

6. Eco-Friendly Hardware Procurement

7. E-Waste Management

8. Green IT as a Competitive Advantage

Drivers of Green IT Strategies:

1. Environmental Concerns: Growing awareness of climate change, resource depletion, and environmental degradation has prompted businesses and individuals to adopt more sustainable practices, including within the IT sector.

2. Cost Savings: Energy-efficient IT practices can lead to reduced operational costs due to lower energy consumption, improved hardware utilization, and decreased waste management expenses.

3. Regulatory Compliance: Government regulations and standards related to energy efficiency and e-waste management have pushed organizations to adopt greener IT practices to avoid legal and financial consequences.
4. Corporate Social Responsibility (CSR): Many companies are incorporating sustainability goals into their CSR initiatives, leading to the adoption of greener practices across all aspects of their operations.
5. Consumer Expectations: Consumers and clients increasingly prefer environmentally conscious businesses, encouraging companies to implement Green IT strategies to remain competitive.

Dimensions of Green IT Strategies:
1. Energy Efficiency and Management: Focuses on reducing energy consumption by adopting energy-efficient hardware, optimizing data center operations, and implementing power management practices.
2. Lifecycle Management: Involves considering the environmental impact of IT products throughout their entire lifecycle, from manufacturing to disposal, and adopting strategies to minimize waste.
3. Virtualization and Cloud Computing: Maximizes resource utilization by running multiple virtual instances on a single physical server, and promotes cloud services that enable efficient sharing of resources.
4. E-waste Management: Focuses on responsible disposal and recycling of electronic waste, reducing the environmental impact of obsolete hardware.
5. Telecommuting and Remote Work: Encourages remote work arrangements to reduce commuting and office-related energy consumption.
6. Renewable Energy Integration: Involves using renewable energy sources, such as solar and wind power, to run data centers and IT operations.
7. Data Center Optimization: Focuses on efficient data center design, cooling mechanisms, and hardware consolidation to minimize energy usage.

Goals of Green IT Strategies:
1. Energy Reduction: Reduce energy consumption by optimizing IT operations, using energy-efficient hardware, and promoting power management practices.
2. Carbon Footprint Reduction: Minimize carbon emissions associated with IT operations by adopting renewable energy, energy-efficient technologies, and efficient hardware.
3. Waste Reduction: Minimize electronic waste through responsible disposal and recycling practices, extending the lifecycle of devices, and reducing unnecessary purchases.
4. Operational Efficiency: Improve the efficiency of IT operations by optimizing resource utilization, reducing downtime, and enhancing overall productivity.
5. Cost Savings: Lower operational costs through reduced energy consumption, improved hardware utilization, and minimized waste management expenses.
6. Regulatory Compliance: Ensure compliance with environmental regulations and standards related to energy efficiency and e-waste management.
7. Brand Image Enhancement: Enhance corporate reputation by demonstrating environmental responsibility and commitment to sustainability.
Green IT strategies play a crucial role in promoting a more sustainable and responsible approach to technology usage. By adopting these strategies, organizations can contribute to environmental preservation while enjoying economic benefits and improved competitiveness.