AP CSP STANDARDS on INTERNET

6.1 The Internet is a network of autonomous systems.

6.1.1 Explain the abstractions in the Internet and how the Internet functions. [P3]

Exclusion Statement (LO 6.1.1*): Specific devices used to implement the abstractions in the Internet are beyond the scope of this course and the AP Exam.*

6.1.1A The Internet connects devices and networks all over the world.

6.1.1B An end to end architecture facilitates connecting new devices and networks on the Internet.

6.1.1C Devices and networks that make up the Internet are connected and communicate using addresses and protocols.

6.1.1D The Internet and the systems built on it facilitate collaboration.

6.1.1E Connecting new devices to the Internet is enabled by assignment of an Internet protocol (IP) address.

6.1.1F The Internet is built on evolving standards, including those for addresses and names.

Exclusion Statement (6.1.1F): Specific details of any particular standard for addresses are beyond the scope of this course and the AP Exam.

6.1.1G The domain name system (DNS) translates domain names to IP addresses.

6.1.1H The number of devices that could use an IP address has grown so fast that a new protocol (IPv6) has been established to handle routing of many more devices.

6.1.1I Standards such as hypertext transfer protocol (HTTP), IP, and simple mail transfer protocol (SMTP) are developed and overseen by the Internet Engineering Task Force (IETF).

6.2 Characteristics of the Internet influence the systems built on it.

6.2.1 Explain characteristics of the Internet and the systems built on it. [P5]

6.2.1A The Internet and the systems built on it are hierarchical and redundant.

6.2.1B The domain name syntax is hierarchical

6.2.1C IP addresses are hierarchical.

6.2.1D Routing on the Internet is fault tolerant and redundant.

6.2.2 Explain how the characteristics of the Internet influence the systems built on it. [P4]

6.2.2A Hierarchy and redundancy help systems scale.

6.2.2B The redundancy of routing (i.e., more than one way to route data) between two points on the Internet increases the reliability of the Internet and helps it scale to more devices and more people.

6.2.2C Hierarchy in the DNS helps that system scale.

6.2.2D Interfaces and protocols enable widespread use of the Internet.

6.2.2E Open standards fuel the growth of the Internet.

6.2.2F The Internet is a packet-switched system through which digital data is sent by breaking the data into blocks of bits called packets, which contain both the data being transmitted and control information for routing the data.

Exclusion Statement (6.2.2F): Specific details of any particular packet switching system are beyond the scope of this course and the AP Exam.

6.2.2G Standards for packets and routing include transmission control protocol/Internet protocol (TCP/IP).

Exclusion Statement (6.2.2G): Specific technical details of how TCP/IP works are beyond the scope of this course and the AP Exam.

6.2.2H Standards for sharing information and communicating between browsers and servers on the Web include HTTP and secure sockets layer/transport layer security (SSL/TLS).

Exclusion Statement (6.2.2H): Understanding the technical aspects of how SSL/TLS works is beyond the scope of this course and the AP Exam.

6.2.2I The size and speed of systems affect their use.

6.2.2J The bandwidth of a system is a measure of bit rate the amount of data (measured in bits) that can be sent in a fixed amount of time.

6.2.2K The latency of a system is the time elapsed between the transmission and the receipt of a request.

6.3 Cybersecurity is an important concern for the Internet and the systems built on it.

6.3.1 Identify existing cybersecurity concerns and potential options to address these issues with the Internet and the systems built on it. [P1]

6.3.1A The trust model of the Internet involves tradeoffs.

6.3.1B The domain name system (DNS) was not designed to be completely secure.

6.3.1C Implementing cybersecurity has software, hardware, and human components.

6.3.1D Cyber warfare and cybercrime have widespread and potentially devastating effects.

6.3.1E Distributed denial of service attacks (DDoS) compromise a target by flooding it with requests from multiple systems.

6.3.1F Phishing, viruses, and other attacks have human and software components.

6.3.1G Antivirus software and firewalls can help prevent unauthorized access to private data.

6.3.1H Cryptography is essential to many models of cybersecurity.

6.3.1I Cryptography has a mathematical foundation.

Exclusion Statement (6.3.1I): Specific mathematical functions used in cryptography are beyond the scope of this course and the AP Exam.

6.3.1J Open standards help ensure cryptography is secure.

6.3.1K Symmetric encryption is a method of encryption involving one key for encryption and decryption.

Exclusion Statement (6.3.1K): The methods used in encryption are beyond the scope of this course and the AP Exam.

6.3.1L Public key encryption, which is not symmetric, is an encryption method that is widely used because of the enhanced security associated with its use.

Exclusion Statement (6.3.1L): The mathematical methods used in public key encryption are beyond the scope of this course and the AP Exam.

6.3.1M Certificate authorities (CAs) issue digital certificates that validate the ownership of encrypted keys used in secured communication and are based on a trust model.

Exclusion Statement (6.3.1M): The technical details of the process certificate authorities follow are beyond the scope of this course and the AP Exam.

7.1 Computing enhances communication, interaction, and cognition.
7.1.1 Explain how computing innovations affect communication, interaction, and cognition. [P4]

7.1.1M The Internet and the Web have enhanced methods of and opportunities for communication and collaboration.
7.1.1N The Internet and the Web have changed many areas, including ecommerce, health care, access to information and entertainment, and online learning.
7.1.1O The Internet and the Web have impacted productivity, positively and negatively, in many areas.
7.4.1D Groups and individuals are affected by the 'digital divide' -- differing access to computing and the Internet based on socioeconomic or geographic characteristics.