

JOLUME

# Supplement to Computer Science

— With —

# UNIT 5

**COMMUNICATION TECHNOLOGIES** (Networking and Open Source Software)

As per the CBSE Syllabus for 2017-18 released on March 31, 2017



#### **REVISED SYLLABUS**

#### **UNIT 5**

#### **COMMUNICATION TECHNOLOGIES**

(Networking and Open Source Software)

**Evolution of Networking:** ARPANET, Internet, Interspace – Different ways of sending data across the network with reference to switching techniques (Circuit and Packet switching).

**Data Communication terminologies:** Concept of Channel, Bandwidth (Hz, KHz, MHz) and Data transfer rate (bps, Kbps, Mbps, Gbps, Tbps).

**Transmission media:** Twisted pair cable, coaxial cable, optical fibre, infrared, radio link, microwave link and satellite link.

Network devices: Modem, RJ-45 connector, Ethernet Card, Router, Switch, Gateway, Wi-Fi card.

Network Topologies and types: Bus, Star, Tree, PAN, LAN, WAN, MAN.

**Network Protocol:** TCP/IP, File Transfer Protocol (FTP), PPP, SMTP, POP3 Remote Login (Telnet) and Internet Wireless/Mobile Communication protocol such as GSM, CDMA, GPRS, and WLL.

Mobile Telecommunication Technologies: 1G, 2G, 3G and 4G; Mobile processors;

Electronic mail protocols such as SMTP, POP3

Protocols for Chat and Video Conferencing VOIP

Wireless technologies such as Wi-Fi and Wi-Max

#### **Network Security Concepts:**

Threats and prevention from Viruses, Worms, Trojan horse, Spams

Use of Cookies, Protection using Firewall, https;

India IT Act, Cyber Law, Cyber Crimes, IPR issues, hacking.

Introduction To Web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML); Hyper Text Transfer Protocol (HTTP); Domain Names; URL; Website, Web browser, Web Servers; Web Hosting, Web Scripting–Client side (VB Script, Java Script, PHP) and Server side (ASP, JSP, PHP), Web 2.0 (for social networking).

E-commerce payment transactions using online banking, mobile banking and payment apps and services.

## **Mobile Communication Technologies and E-Commerce**

#### **Mobile Processors**

Processors are required to run an operating system, be it a desktop, laptop or a mobile. Processors provide the necessary resources to start an operating system, run applications and do certain

tasks. Today's smartphones and mobile processors are very powerful, so much so that they can compete with desktop computers.

Processors are now available in many cores. First it was single core, then came the dual core, and we now have quad core, hexa core and even octa core processors. Most processors available today are 64-bit as against 32-bit earlier.



The processing speed has also touched 3.0-3.5 GHz now. The ability to equip mobile processors with GPU (Graphics Processing Unit) has enabled the devices to churn out best graphic pictures, have 3-D capability, Virtual Reality and 4K recording capability. The improved processor technology has also made modern mobile devices more power-efficient.

Today, there are many processors available in the market. Qualcomm, Apple mobile processors, Intel mobile processors and some other giants are ruling the market. Let us discuss these mobile processors.

#### Qualcomm Snapdragon

Qualcomm Technologies is a US-based company. Qualcomm first became a known brand when they introduced CDMA technology. Qualcomm is actively involved in technology related to semiconductor designing for mobile devices, tracking devices, satellite phones, virtual reality, wireless charging, communications, etc. Qualcomm is now known for its Snapdragon brand which is responsible for marketing mobile processors and LTE modems [4G].



Snapdragon became a big name in the processors market

after it introduced the first 1 GHz processor when the average speed of most smartphones was only 512 MHz.

Since 2005, Snapdragon has come out with a number of series – S1, S2, S3, S4, S200, S400, S600, and S800. S800 series has already released S800, S801, S805, S808, S810, S820, and S821. The most common Qualcomm processor in medium-to-high-end phone market is either S820 or S821, which is the latest version.

#### **Apple Mobile Processors**

Apple does not manufacture microprocessors. Instead, it enters into contracts with processor manufacturing companies, mainly Samsung and TSMC, for making custom-built processors that suit its design and performance expectations. For instance, A9 14nm processor was built by Samsung, while the A9 16nm version was built by TSMC.

• Apple A series is designed for processors to be used in iPhone, iPad, iPad Touch and Apple TV. Some of



the processors in the series are A4, A5, A5X, A6, A6X, A7, A8, A8X, A9, A9X and A10.

- **Apple A10 Fusion** is the latest processor which is used in iPhone 7 and iPhone 7 Plus. A10 is a quad core built on 16 nm FinFET processor capable of running at 2.4GHz speed and a hexa core PowerVR GPU. A10 is twice as fast as its predecessor A9, and improves graphic processing by 50%. This processor is manufactured by TSMC.
- **Apple S series** is designed for processors to be used in Apple Watch. Some of the processors in the series are Apple S1, Apple S1P and Apple S2. The current version, Apple S2, is a dual core processor with built-in GPS used in Apple Watch Series 2. The processor is manufactured by Samsung under a contract with Apple.
- **Apple W series** is used in headphones for wireless audio connectivity. The current series, Apple W1, is used in wireless headphones and AirPods.
- **Apple T series** is designed to be used in TouchID sensors in MacBook Pro. The only version released till date is Apple T1.

#### Intel Atom and Core M Processors

Intel is an American multinational company synonymous with PC and microprocessors. Atom is the brand name given for the low power-consuming and low-cost 32-bit and 64-bit chips manufactured for smartphones and tablets.



Intel processors are based on X86 architecture which is more powerful than ARM, but consumes more power compared to ARM architecture. The latest versions of Intel processors have reduced the power consumption, bringing it down to less than 5 watts, which is ideal for all mobile devices. Though Atom processors in the beginning supported only Windows, they now support all major mobile operating systems.

**Intel Atom processors** are currently used in Atom X5 and X7 series. These chips are 64-bit quad core processors in 14 nm size with speeds of up to 1.6 GHz that can be scaled up to 2.4 Ghz.

Intel also released **Intel Core M** ultra low-voltage microprocessors designed for ultra-thin notebooks,

mobile devices and 2-in-1 convertibles. The processor consumes 4.5 watts or less power, making it ideal for the long battery life. These are dual core processors with a speed of about 1.5 GHz which can be scaled up to 3.2 GHz. Intel Core M processors offer 40% boost in CPU and graphics performance as compared to the earlier versions.

#### Nvidia Tegra

Nvidia Corporation is a US-based technology company which specializes in making processing units for graphics, gaming units and mobile devices. Nvidia develops chips for smartphones,

tablets and mobile devices under the brand Tegra.

Tegra processors are built on 64-bit ARM architecture. Tegra has already marketed Tegra 1, Tegra 3, Tegra 4, Tegra 4i, Tegra K1, Tegra X1. Tegra X1 is currently the most advanced Tegra chip in the market. The processor is Quad Core with 256 GPU cores and 4K video capabilities. The chips are built on 20 nm technology. The processor is currently used in Nvidia SHIELD Android TV.



The Tegra processors mainly used in smartphones and tablets are Tegra 4, Tegra 4i and Tegra K1.

#### Media Tek

MediaTek is a Taiwanese semiconductor company providing chips for mobile devices, HDTVs and other electronic devices.

MediaTek processors are built on 64-bit ARM architecture. The latest MediaTek processor supports up to 3 GHz speed. They come in a variety of cores such as dual core (2 core), quad core (4 core), hexa core (6 core) and deca core (10 core).

The latest processors from MediaTek, **Helio X20** and **Helio X25**, are used in smartphones and tablets. MediaTek processors are mostly popular with Chinese manufacturers. Xiaomi, Meizu, LeEco Le,

Yu, etc., use them in smartphones. Acer, Asus, Lenovo, Amazon Fire HD, QMobile are some of the other manufacturers that use MediaTek processors in their tablets.

Helio X30 and Helio X27, the latest from the company's stable, use 10 nm and 20 nm processors respectively. Both are deca core with 2 dual core and a single dual core built inside the processor.

#### HiSilicon

HiSilicon is a Chinese company specializing in semiconductor technology. The company, owned by Huawei, creates chips based on ARM architecture. It is the largest domestic integrated circuit designer in China.

Some of the processors released by HiSilicon are K3V1, K3V2, K3V2E, Kirin 620, Kirin 650, Kirin 910, Kirin 920, Kirin 930, Kirin 950 and Kirin 960.

Some of the devices with Kirin 950 are Honor 8, Huawei Mate 8 and Huawei MediaPad M3.

Kirin 960 is the latest model to be released in the series. It is built on 64-bit ARM architecture on 16 nm FinFET technology. The processor is quad core capable of attaining a speed of 2.4GHz.





#### Samsung Exynos

Exynos is a brand of Samsung Electronics which makes processors based on ARM architecture. Some of the processors in the series are Exynos 7 Dual, Exynos 7420, Exynos 7 Octa 7580, Exynos 7 Octa 7870.

Exynos 8 Octa 8890 is the latest processor from Exynos. The processor is equipped with Octa Core on 64-bit ARM architecture with Mali GPU. The processor is capable of running at a speed of 2.3 GHz



with support for 3D gaming and 4K UHD resolution. The chips are built on 14 nm technology. **Exynos 8 Octa 8890** is used in Samsung Galaxy S6 and S6 edge.

#### **E-Commerce**

E-commerce (electronic commerce or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the internet. These business transactions occur either as business-to-business, business-to-consumer, consumer-to-consumer or



consumer-to-business. The terms e-commerce and e-business are often used interchangeably.

E-commerce is conducted using a variety of applications, such as email, online catalogs and shopping carts, EDI, File Transfer Protocol, and web services. This includes business-tobusiness activities and outreach such as using email for unsolicited ads (usually viewed as spam) to consumers and other business prospects, as well as to send out e-newsletters to subscribers. More companies now try to entice consumers directly online, using tools such as digital coupons, social media marketing and targeted advertisements.



Mobile Communication Technologies and E-Commerce

The advantages of e-commerce include its round-the-clock availability, speed of access, wide availability of goods and services to the consumer, easy accessibility and international reach.

#### **Payment Transactions through E-Commerce**

#### **Online Banking**

Online banking, also known as internet banking, e-banking or virtual banking, is an electronic payment system that enables customers of a bank or a financial institution to conduct a range of financial transactions through the financial institution's website.

#### Mobile Banking

Mobile banking is a service provided by a bank or a financial institution that allows its customers to conduct a range of financial transactions remotely using a **mobile** device such as a mobile phone or tablet, and using software, usually called an app, provided by the financial institution for the purpose.

#### **Payment Apps and Services**

Payment apps are also referred to as Mobile Wallets. There are many payment apps available in the market which are very efficient to use and convenient to handle.

The following are some of the wallets which are frequently used in the market.

- (1) Google Wallet
- (3) Paytm Wallet
- (5) MobiKwik Wallet
- (7) Square Wallet
- (9) Dwolla
- (11) Bharat Interface for Money (BHIM) App

The online mode of payment has brought about a drastic change to marketing. There are many start-ups which are doing very well thanks to the online mode of payment. This revolution has taken the world by storm and is well appreciated.

#### Solved Questions —

- 1. What is a mobile processor?
- Ans. Mobile processors are required to run an operating system, be it desktop, laptop or mobile. They provide the necessary resources to start an operating system, run applications and do tasks.
  - 2. Name any four popularly available mobile processors in the market?
- Ans. The four popularly available mobile processors are: Qualcomm Snapdragon, Apple's mobile processors, HiSilicon and Samsung Exynos processors.
- 3. What are the advantages of E-commerce applications?
- Ans. The advantages of e-commerce include its round-the-clock availability, speed of access, wide availability of goods and services for the consumer, easy accessibility and international reach.

#### Unsolved Questions =

- 1. What are mobile processors? Give examples.
- 2. Differentiate between Online banking and Mobile banking.





Mobile

Banking

#### (2) Apple Passbook (4) Freecharge Wallet

- (6) PayU
- (8) PayPal
  - (10) Venmo





### **SULTAN CHAND & SONS (P) LTD**



Educational Publishers 4859/24, Darya Ganj, New Delhi - 110 002 (India) Phones: 011-4354 6000 (100 Lines), 2324 3939 Fax: (011) 2325 4295 E-mail: scs@sultanchandebooks.com • Buy books online at: www.sultan-chand.com f www.facebook.com/SultanChand.SCS