Research Work -1

1) List out (at least five) microcontroller supplier companies.

ON Semiconductor

ON Semiconductor caters alongside of 8-bit and 16-bit general purpose and application-specific microcontroller devices. It has a massive product portfolio to cater in the MCU space. With today's electronics getting more complex, smart and high-rel, ON Semiconductors' MCUs have been a leading player in this domain.

ROHM Semiconductor

Kyoto based electronic components manufacturer; ROHM has made its name in top 10 major microcontroller's manufacturers by its world class product offerings. ROHM's expansion overseas soon made a worldwide market share and through its MCUs, ROHM has been innovation and empowering this space.

Texas Instruments

Texas Instruments (TI) not just in the IC space but the company is leading player in the MCU market. TI provides a portfolio of low-power, high-performance microcontrollers (MCUs). TI MCUs brings along wired and wireless options. TI MCUs are supported by a common RTOS software platform giving designers the access to a robust development ecosystem.

NXP

NXP Semiconductor's microcontrollers are making solutions more advance. NXP microcontrollers have been leading market traction for innovators. For long, it has been offering its leading MCU portfolio in the market. NXP is driving innovation in the automotive, industrial & IoT, mobile and communication infrastructure markets.

Toshiba

Toshiba offers a wide range of semiconductors and storage products, making us a single-source option for a number of solutions and customers. Toshiba also has vast offering in the

microcontroller space. Toshiba MCUs are well accepted in the market and draws massive revenue for the company. Toshiba has been working closely with OEMs, ODMs, CMs, VARs and fabless chip companies, as well as retailers and our distribution partners to define the right product mix and new technology innovations.

2) List out (at least five) microprocessors supplier companies.

- EPSON

It's little wonder that Epson India has such a stellar reputation for high-quality products and excellent customer service. Epson is one of the leading **microprocessor manufacturers** that has cutting-edge microprocessor systems to suit the demands of the modern market.

- Intel

Chipsets, network adapter processors, and electronic components are all manufactured by Intel, an integrated device manufacturer. Memory chips, such as the world's largest first transistor, were the company's first offerings.

- NVIDIA Corp. (NVDA)

Mainstream and high-end visual graphics cards from Nvidia can be involved in a wide variety of systems. GPUs are widely used by computer gamers, visual illustrators, and designers who use computer-aided design software.

- Microprocessor Kit

In Bangalore, Karnataka, India. In the year 1990, the business was founded. Since its foundation, this company has had consistent progress in the field of Electronic Production industry, distribution, and trade.

- Gretex Corporate Services Private Limited

Located in Kolkata, India (700012, West Bengal), they provide their services worldwide. Founded in 2007 is Gretex Corporate Services Private Limited. It is also well-known in the entertainment industry for its high level of customer care and has grown to be a household name.

3) What is system on cheap (SOC)? Give any 2 examples of SOC.

A System on a Chip, or SoC, is a single integrated chip (IC) that includes the components normally found in a standard computer system. For example, on an SoC you may find a CPU

(Central Processing Unit), RAM (Random Access Memory), storage, I/O (input/output) ports, and more.

4) What are the difference between opcode and hex code?

Opcode	Hex Code
The opcode is the instruction that is executed by the CPU and the operand is the data or memory location used to execute that instruction.	Hex, in this context, stands for "hexadecimal", a number system in which there are 16 basic numerals, rather than the more familiar 10. This is the number system used by HTML, and many other programming languages for that matter.
An opcode is the first part of an instruction that tells the computer what function to perform. Every computer has an operation code or opcode for each of its functions	Examples- So Hexadecimal numbers have 16 symbols or digital values, i.e 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F. A, B, C, D, E, F are single bit representations of 10, 11, 12, 13, 14 and 15 respectively.
Examples In assembly language mnemonic form an opcode is a command such as MOV or ADD or JMP. For example. MOV AL, 34h.	

5) What are the advantages of digital system over analog system?

Reproducibility of the results and accuracy.

Ease of design: No special math skills needed to visualize the behaviour of small digital (logic) circuits.

Flexibility and functionality.

Programmability.

Speed: A digital logic element can produce an output in less than 10 nanoseconds (10-8 seconds).

Economy: Due to the integration of millions of digital logic elements on a single miniature chip forming low cost integrated circuit (ICs).