

NTRODUCTION

2 significant changes - computer marketplace the virtual elimination of assembly language programming. - creation of vendor indepedent operating system. new set of architectures RISC to Critical parts tech RISC- based machines focussed exploitation 127 8 action. The Devicemonia - Oriented Personalist RISC based nonputers on the Nounce DEC VAX. performance bar any extel separate intel translating 20x86 instructions into RISC like instructions internally. proposal is changing ARM oabir bus espans the dramatic growth rate 20th century, for fold. significantly enhanced the capacity available to the computer dramatic improvement in cost performance led to new class of computers. improvement of semiconductor manufacturing ·moore's lay.

microprocessor-based computers.

entire manye of comp. design.

hardware innovation renaissance in computer design.

hardware renaissance let to 20,000 fold performance improvement. since 1978.

in place of performance-oriented languages like cand cit, much more programming is done in managed languages like java and scala.

nature of applications is changing

speech, sound, images, and video

power density was constant,

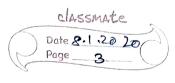
1974 robert dennard - .

simple processor ILP DLP TLP RLP.

2010 intel processor had 1.170 to billion clerk

2016 Babillion den. (if moore's law continued), 1.75 billion depts. (actual)

high chil.



dasses of computers.

dramatic change in how we view competing, competing applications, competer markets.

five diverse computer markets characterized by different applications, requirements, and computing technologies.

internet of things / embedded computers.

microwaves, washing machine, most printers, networking switches, and all automobiles.

sor refers to embedded computers that are connected to the internet typically wirelessly. when augmented with sensors and actuators.

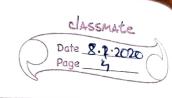
10T devices collect useful data and interact with physical world.

they include 8bit to 32 bit.

for the high end 64 bit processors

Cost in the st

Cost 1 penny to 100\$.



PERSONAL MOBILE DEVICES

they are a collection of wireless devices with multimedia user interfaces - such as - Cell phones, tablet computers,...

a few hundred dollars.

energy efficiency is important,

applications on DMDs of are often web-based

and media oriented.

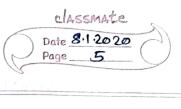
Share many characteristics of desktop computers.

DESKTOP COMPUTER

plash memory.

and high end & Cheavily configured workstation that may sell for \$2500.

optimize price performance.



SERVERS

and Computing services.

availability, scalability, and efficient through-

provide large-scale and more reliable file

Mortaline as Last and it is a last grant -

CLUSTERS AND WAREHOUSE

growth of SAAS. & social networking, video viewing and sharing, multiplayer games,

on-line shopping.

price performance is important. and power critical to wsc. \$ 40 million.

Marin it is a second that the second to the

site for supercomputers.

grand challenge problems.

e a constant - benefit and

SCALE COMPUTERS.