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(1)

(1) Answer each of the following.

A)

Ans:

Data processing:

Data can take a wide variety of forms and process requirement is based.

Data storage:

Storing data & retrieving in memory.

Data movement:

Moving data from one to the other location i.e main to Secondary memory.

Control:

A control unit manages resources and orchestrates performance. Acting on instructions.

(2)

B)

Ans:

ISU:

Determine the sequence in which Instructions are to be executed. (Superscale Architecture)

IDU:

Feed from IFU is responsible for the parsing and decoding all z/Architecture operation code.

LSU:

Responsible for handling all types of operand accesses length.

XU:

Translate logical address from Instruction into physical address in main memory.

FXU:

Executes fixed point arithmetic operations

BFU:

Handle all binary Hexadecimal floating

DFU:

Handle Fixed and float points

RU:

Keep copy of the complete state of System that includ all registers.

CCP:

Responsible for data Compresaion and encyption.

I-Cache:

64 Kb L1 Instruction cache allow ifu to feteh Instruction.

L2 control:

Control logic that mange traffic

L2 Data:

1 MB L2 data cache for all memory

traffic other than instructions.

Instr_L2:

L1-L2

Instruction cache.

C)

Ans:

IAS operates by performing instruction cycle each consist of two sub-cycles.

opcode of next instr is loaded in IR and address portion is loaded in MAR. This instruction maybe taken from IBR.

The control circuitry interpt opcode and execute the instruction, by ALU.

D)

Ans:

=> (A)

No. these programs

are never considered to be embedded because they are not integral component.

=>(b): yes, the Software within the disk drive control HDA Hardware and is hard real time aswell.

=>(c): NO, I/O drivers do not repeat embedded System

=>(d): yes, PDA is Embeded system

=>(e): yes, the firmware in cell phone is controlling the radio hardware.

=>(f): yes, These computers were the most powerfull and very large. The Software running in these computers control the radar hardware.

=>(g) EMS is not embedded if EMS is not connected to avionics and is used only for logistic Computerization.

=>(H) yes, Both ar embedded.

=>(i) yes, In this case Systen is embedded.

=>(J) Engine is part of a bige System and directly controlled through hardware So "yes".

Q:NO:02:

Ans:

=>(A) there are four main structures.

i CPU: Central processing unit Control operation of Computer

ii Main Memory: Store Memory

iii I/O: Move data between Computer and external environment.

iv System Interconnection: provide Communication between CPU and I/O.

=>(B) The characteristics are as follow.

=> Identical Instruction set:
Lower family has set that is subset of Higher family so program can move up but not down.

=> Identical operating System:
Some OS are similar for all family members.

=> Increasing Speed: Increases as we go from lower to higher family.

=> Number of I/O ports:
Increase from lower to higher family members.

=> Memory size: Increases from lower to higher family members.

=> Cost: Increase from lower to higher family members.

(C) Stored - program - concept was first implemented in "IAS" by John von neuman First publication of idea was in 1945 for a new computer (EDVAC)
It consist of:
1 Main Memory:
2 Arithmatic Logic Unit:

(D) This De Mooo's law was given by cofounder of intel Gordon Moore in 1965. He observed that number of transister are doubling on chip every year.
Consequences:
1: Cost has fallen at dramatic rate
2: The speeed has been Incresing.
3: Computers are becoming Smaller
4: Reduction in powes
5: Fewes Interchip Connections.

Ones. (9)

Q:NO:03:

A:

Computes Architecture:

=> Refers to attributes that are visible to programmers

=> Attributes that have direct or logical impact execution

Computes Organization:

=> Refers to operational units and their inter-connection.

=> I/O machnism, instruction set etc.

B:

Cisc:

(1) Large Instruction set
(2) Complex processor, requiring millions of transistors.
(3) Intel, AMD,

Risc:

(1) Simple single cycle
(2) Few Instruction and transitors are required thus cost is low
(3) Apple Mac G3, Power PC.

C:

Micro processor.

(1) Heart of Computer System
(2) Only a processor. other components have to be connected.

(3) Cannot be used in compact System
(4) Cost Increases.

Micro Controllers:

(1) Heart of embedded System
(2) Has external processor along with memory and I/O
(3) The circuit is small
(4) Cost is low.

D:

Cortex A:

=) Cortex A is a application processor
=) Used in smart phones mostly. Also digital TV etc

Cortex R:

=) Cortex R is design

(2)

for real time applications.

=> It has a high clock frequency and low latency time.

Cortex M:

=> Cortex M is developed for microcontrollers.

=> Designed for lowest gate count and lowest possible power consumption.

Q:NO:04:

A: Part A

Content are divided into 5bit of two Instructions,

LH , RH

LH = 010 FA
OPcode = 01
address = 0FA

(14)

RH = 210FB
opcode = 21
address = 0FB

Now converting to binary

LH:

01 = 00000001 = Load(M
M(x) = 0FA

First 5 bit of 08A should read Load M(0FA

RH:

21 = 00100001 = Stor M(x)

M(x) = 0FB

Second 5 bit should read on STOR M(0FB)

Assembly code for 08A is:

(010FA210FB)

Load M(0FA)
STOR M(0FB)

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(2)

LH = 010FA
opcode = 01
Address = 0FA

RH = 0F08D
opcode = 0F
Address = 08D

Converting:

LH:
01 = 00000001 =
Jump + M(x, 0:19)
Address location 08D

Second 5 bit should
Read on Jump + M(08D,
0:19)
Assembly code for 08B=

010FA0F08D
Load M(0FA)
Jump + M(08D, 0:19)

(3)

LH = 020FA
opcode = 02
Address = 0FA

RH = 210FB
Opcode = 21
Address = 0FB

LH:

02 = 00000010 = Load-M(x)

Refer to 0FA

First 5bit for Opc should Load

Load - M(0FA)

RH:

21 = 00100001 = STOR M(x)

M(x) = 0FB

Second 5bit of Opc should read STOR(0FB)

Assembly code = 020FA210FB

Load = M(0FA)
STOR - M(0FB)

Part:
B:

(1) In 08A address The M(0FA) transfer transfer to accumulator and transfer content to 0FB

(2) In 08B address The M(0FA) transfer to accumulator and take next instruction from left half of M(08B)

(3) In 08C address The M(0FA) transfer to accumulator and transfer content to memory location 0FB